Regional Biosolids Storage Facility for Greater Dublin

Stage 3 Report – Identification of Preferred Site

August 2017

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Glossary

Acronym/Term	*Description*
AADT	Annual Average Daily Traffic
ABP	An Bord Pleanála
AEP	Annual Exceedance Probability - the probability (expressed as a percentage) of a flood occurring in any given year that is equal to or more severe than a given magnitude or severity.
CFRAM	Catchment Flood Risk Assessment and Management
CGS	County Geological Site
CSO	Central Statistics Office
EIAR	Environmental Impact Assessment Report
EMWMP	Eastern Midland Waste Management Plan
EPA	Environmental Protection Agency
ESB	Electricity Supply Board
FEMFRAM	Fingal East Meath Flood Risk Assessment and Management
FSU	Flood Studies Update
GDD	Greater Dublin Drainage – the proposed new wastewater network and wastewater treatment plant for north Dublin
GDSDS	Greater Dublin Strategic Drainage Study
GSI	Geological Survey Ireland
HGV	Heavy Goods Vehicle
HSE	Health Service Executive
IAQM	Institute of Air Quality Management
IFI	Inland Fisheries Ireland
IoH	Institute of Hydrology
LCA	Landscape Character Assessment
MCC	Meath County Council
NHA	Natural Heritage Area
NIAH	National Inventory of Architectural Heritage
NS	National School
NWSMP	National Wastewater Sludge Management Plan
OPW	Office of Public Works
PE	Population Equivalent
PFRA	Preliminary Flood Risk Assessment
PIR	Potential Impact Rating – comparative rating in assessment of noise impact
pNHA	Proposed Natural Heritage Area
PPCP	Pathogens, Pharmaceuticals and Personal Care Products
RBSF	Regional Biosolids Storage Facility
RFC	Ratio of Flow to Capacity
RMP	Record of Monuments and Places
RSA	Road Safety Authority
RSIA	Road Safety Impact Assessment
SAC	Special Area of Conservation

SDCC	South Dublin County Council
SMR	Sites and Monument Record
SPA	Special Protection Area
SuDS	Sustainable Urban Drainage System
TII	Transport Infrastructure Ireland
WI	Waterways Ireland
WMP	Waste Management Plan
WSSP	Water Services Strategic Plan
WwTP	Wastewater Treatment Plant

Executive Summary

Irish Water is currently at an advanced stage of planning two significant wastewater treatment facilities for Dublin, namely Ringsend Wastewater Treatment Plant (WwTP) Upgrade and Greater Dublin Drainage project. These projects were identified in the Greater Dublin Strategic Drainage Study (GDSDS), published in 2005, as essential to cater for the continued expansion of the City and its environs. In 2016, Irish Water published the National Wastewater Sludge Management Plan which identified the need for a Regional Biosolids Storage Facility (RBSF) serving Greater Dublin. Irish Water is now undertaking a site selection process, in order to identify a suitable site for the proposed RBSF, which will be included in the planning applications for the Ringsend WwTP Expansion and the Greater Dublin Drainage project. The RBSF will be designed to cater for up to 3 million population equivalent (PE) by 2040, with capacity for expansion to 3.6 million PE, subject to a future planning application. This Report is the third of three reports on the site selection process and specifically deals with the identification of a preferred site.

Biosolids is the treated sludge product arising from wastewater treatment processes. The sludge is fully treated so that it is both biologically stable and free of harmful pathogens (bacteria and viruses etc.). This treatment of wastewater sludge to produce biosolids generally happens at the wastewater treatment plant before the biosolids is transported to a storage facility. Most of the biosolids produced in Ireland (about 98%) is currently reused on agricultural lands as a soil conditioner and as a fertiliser. The current spread lands for biosolids arising in the Dublin region are located in south Leinster and parts of Munster. It is proposed that these spread lands will continue to be used. The use of biosolids on agriculture lands is strictly regulated by European and National law. One of the conditions of use is a strict prohibition on spreading biosolids on lands over the winter period (October to January each year). This restriction means that biosolids reused in agriculture need to be stored for certain periods over each calendar year. The selected site will comprise an area of approximately eight hectares and it is proposed that the principal development on the site would comprise warehouse buildings capable of storing approximately 48,000m^3 of biosolids.

A Stage 1 non-statutory consultation on the proposed RBSF site selection methodology was conducted from 2 February 2017 to 2 March 2017. A total of 64 submissions were received from public bodies and the public generally. Observations were made on the appropriate zoning for sites, biosolids re-use including environmental concerns regarding land spreading, risk of odours and alternative approaches to biosolids re-use in agriculture. These observations were considered as part of the Stage 2 Report and 5 potential sites were shortlisted as follows:

1. **Bracetown/Gunnocks**, Co Meath: This is a 12.5ha site located to the north of Dunboyne and easily accessible from the M3 Motorway.
2. **Gunnocks**, Co Meath: This is a 14.5ha site located north of Dunboyne, directly south of the previous site. It is likewise easily accessible from the M3 Motorway.
3. **Greenogue**, County Dublin: This is a 12.5ha site located off the M7 Motorway, west of Rathcoole in South Dublin.
4. **Newtown/Kilshane,** Dublin 11: This is a 11.4ha site located off the M2 Motorway near Kilshane Cross in Fingal. This site has been previously partially developed as a waste management/recycling facility.
5. **Kilshane,** Dublin 11: This is a 11.3ha site located just north of the previous site. It is likewise easily accessible from the N2 Motorway.

These 5 potential sites proceeded to a detailed assessment phase in accordance with Environmental, Economic & Engineering, Planning and Social & Community criteria with a view to identifying a preferred site. In order to assist with this process, Irish Water undertook a Stage 2 non-statutory consultation over a 5-week period from 11 May 2017 to 15 June 2017. The consultation phase included 3 open days at venues located close to the potential sites. A total of 496 individuals and organisations participated by attending the open days or making submissions. Observations were made on the appropriate zoning for the sites, biosolids re-use including environmental concerns regarding land spreading, site selection methodology, risk of odours, public health concerns, traffic concerns in the vicinity of the sites and alternative approaches to biosolids re-use in agriculture. These observations have been considered as part of the selection process described in the Stage 3 Report. The 5 sites were duly compared under 21 criteria. For each of the criteria, a qualitative approach was adopted and therefore, expert judgement was applied with the following classification adopted to compare the specific sites relative to each other.

Criteria / *Site*		Bracetown/ Gunnocks	Gunnocks	Greenogue	Newtown/ Kilshane	Kilshane
Environmental	Air Quality	●	●	●	●	●
	Odour	▼	▼	▼	●	●
	Noise	●	●	▼	▲	●
	Landscape & Visual	●	▼	●	▲	▼
	Geology & Hydrogeology	●	●	●	●	●
	Hydrology	●	●	▼	▲	▲
	Ecology	●	▼	●	▲	●
	Archaeology, Cultural & Architectural Heritage	●	▼	▼	▲	▼
Economic & Engineering	Traffic	●	●	▼	●	▼
	Road Safety	●	●	●	▲	▼
	Service & Utility Connections	▼	▼	●	▲	▼
	Geotechnical	●	●	●	▼	●
	Distance from Biosolids Source	●	●	●	▲	▲
	Capital & Operating Costs	●	▼	●	▲	●
Planning	Land Use Zoning	●	●	▲	▲	▲
	Planning Policies & Objectives	▼	▼	●	▲	●
	Planning History & Current Usage	●	●	●	▲	●
	Population & Sensitive Receptors	●	●	▼	●	●
	Adjacent Land Use	●	●	●	●	▲
Social & Community	Material Assets	●	●	●	●	▼
	Neighbourhood Character	●	●	●	●	●

Legend: ▲ **More Favourable** ● **Neutral** ▼ **Less Favourable**

Assessment criteria and corresponding assessment classifications

The selection of the final preferred site is based on a cumulative consideration of the classifications. From this assessment, the preferred site is the Newtown/Kilshane site. The advantages of the site are summarised as follows:

- The proposed development would be considered as Permitted in Principle in the Fingal County Development Plan.
- The site has been partially developed for what was intended to be a waste facility for construction and demolition waste, wastewater sludge treatment, biological waste treatment and waste transfer for municipal waste.
- There are existing roads, site services and fencing from this past development, some of which can be incorporated into the proposed development of the RBSF.
- The separate routes to and from the site provides advantages in relation to traffic management and traffic safety.
- The site is located in an existing industrial and infrastructural setting, which includes a quarry and electricity power station. This is the landscape backdrop when the site is viewed from the N2.

Nevertheless, the site presents a good opportunity for incorporation of landscape measures for mitigation.

- The population within 500m of the site is estimated to be less than 30 and the nearest schools are more than 2km to the east of the site. There are no hospitals near the site.

This site will now be subject to a 6-week non-statutory consultation period which seeks the views of stakeholders on the contents of this report. Separately, an Environmental Impact Assessment Report Scoping Document has also been drafted and this will be an integral part of the Stage 3 consultation process.

1.0 Introduction

Irish Water is undertaking a site selection process to find a location for a Regional Biosolids Storage Facility (RBSF) to serve Greater Dublin. The process involves three stages, which are outlined in the Project Roadmap shown in Figure 1. The Project Roadmap sets out the steps to facilitate engagement by the public and all relevant stakeholders as the project progresses. There are three stages of non-statutory public consultation to facilitate engagement specifically on:

Stage 1. Methodology for Site Selection

Stage 2. Identification of Potentially Suitable Sites

Stage 3. Identification of Preferred Site

The proposed methodology by which a suitable site will be selected for the RBSF was first set out in the *Stage 1 Report – Site Selection Methodology* which was published by Irish Water on 2 February 2017. That Report provided the background to the project and explained the proposed methodology for shortlisting potential suitable sites. In seeking feedback during the four-week consultation period between the 2nd February and 2nd March 2017, Irish Water asked the following questions:

- *Tell us your views on the approach to site selection, as described in the Stage 1 Report – Site Selection Methodology.*
- *The general siting considerations and criteria set out the Environmental, Economic, Planning and Social & Community factors that will be considered. Are there other criteria that should be included at this stage?*
- *Are there any additional factors that should be taken into consideration in the selection methodology proposed by the project team?*
- *How would you like Irish Water to communicate with you as the project progresses?*

As the selection process progressed a shortlist of potential sites was identified. The sites and the further details of the methodology adopted in selecting them were provided in *Stage 2 Report – Identification of Potential Sites.* This Report was published on 11th May 2017 and the second round of public consultation, took place between the 11th May and 15th June 2017. Three public information events were held during this period. Irish Water asked the following questions at Stage 2:

- *What do you think of the five potential sites?*
- *Is there any additional information on the potential sites identified that we should be aware of?*
- *In addition to the Environmental, Economic & Engineering, Planning, and Social & Community criteria set out to select a preferred site, are there any other factors you think should be considered in choosing the preferred site?*
- *How would you like Irish Water to communicate with you as the project progresses?*

The purpose of this Stage 3 Report is to identify the preferred site for the proposed RBSF and to outline the methodology that has been adopted to identify it.

This Report is structured as follows:

Section 1	Introduction
Section 2	Project Background
Section 3	Shortlist of Potential Sites
Section 4	Assessment and Site Selection Methodology
Section 5 - 9	Assessment of Potential Sites
Section 10	Preferred Site Selection
Section 11	Next Steps

Following consultation, the preferred site will be submitted as part of the planning application for the upgrade of the Ringsend WwTP. It will also be included separately as part of the planning application for the proposed new Greater Dublin Drainage (GDD) project. An Bord Pleanála will undertake statutory consultation on both applications for planning as part of their assessment of these projects.

Figure 1 gives a graphical representation of the site selection process. In particular, it outlines the non-statutory public consultation process and identifies where we currently are within that process.

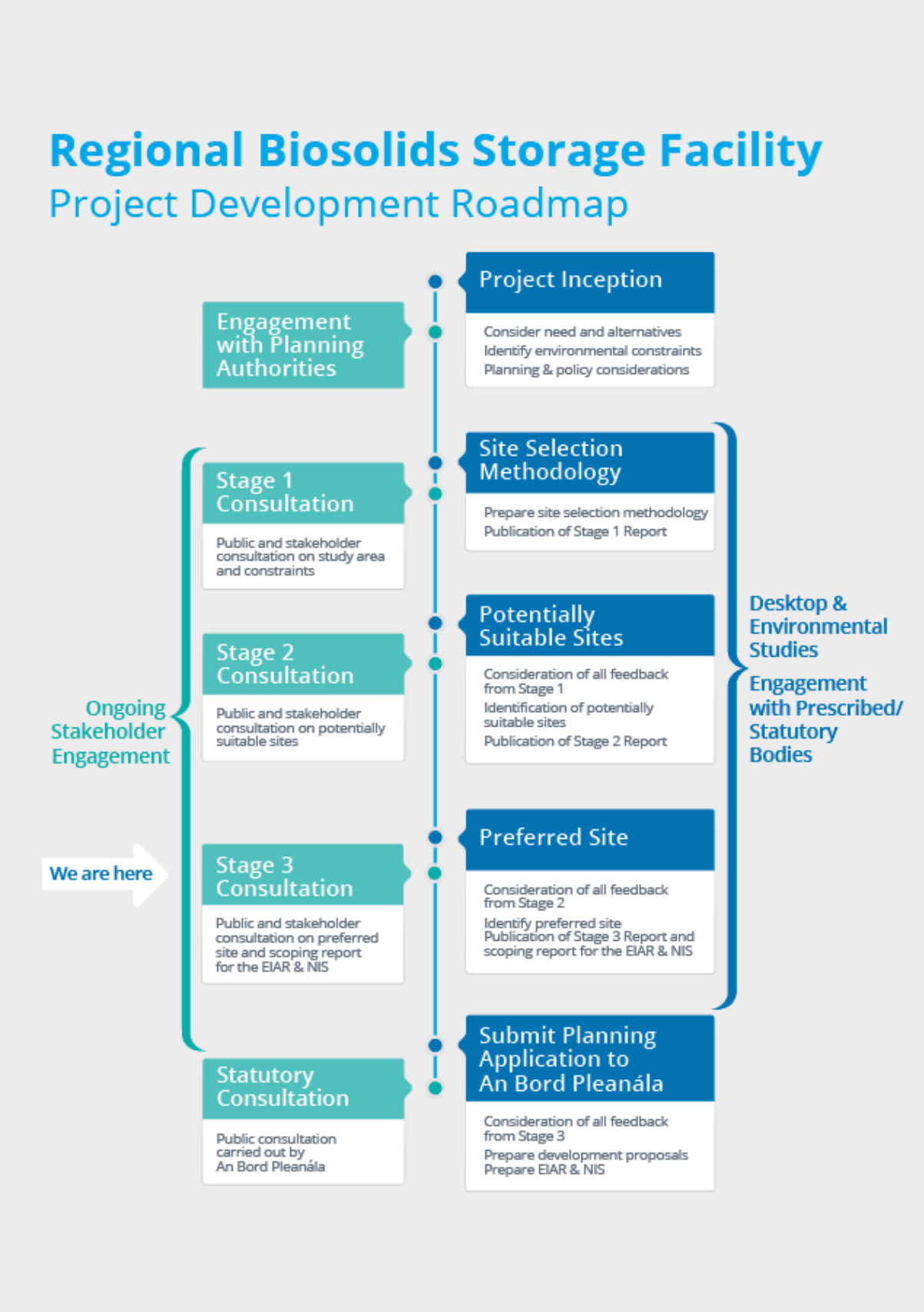

Figure 1 Project Roadmap

2.0 Project Background

2.1 Introduction

The treatment of the wastewater generated in greater Dublin by homes, schools, businesses and industry produces sludge. Wastewater sludge is made up mainly of organic matter that has been removed from the treated water during the treatment process. Further treatment of this sludge is required to enable its safe and efficient re-use or disposal. The further processing of the sludge results in 'biosolids', a biologically stable product free of harmful pathogens (viruses, bacteria) and containing high levels of plant nutrients, e.g. nitrogen and phosphorus. This treatment of sludge all happens at the wastewater treatment plant before the sludge is transported to a biosolids storage facility. Most of the biosolids produced in Ireland (98%) is currently reused on agricultural lands as a soil conditioner and as a replacement for chemical fertilisers. The use of biosolids on agricultural lands is strictly regulated under European and National law. One of the conditions of use is a strict prohibition on spreading biosolids on land over the winter period (October to January). This restriction means that biosolids reused in agriculture need to be stored for certain periods over each calendar year. The need for a regional storage facility serving greater Dublin has been identified by Irish Water in the National Wastewater Sludge Management Plan published in October 2016.

The spread lands currently used for application of biosolids produced at the existing Ringsend WwTP are located in South Leinster and parts of Munster. These lands will continue to be used for spreading of the biosolids to be stored at the proposed RBSF. There is no proposal to change the location of the spread lands.

2.2 Biosolids Description

The aim of the treatment processes used at municipal wastewater treatment plants is to remove both solid and dissolved waste from wastewater and to discharge only clear unpolluted water. Organic and inorganic solids in the wastewater (both solid and dissolved) end up in a sludge which is subject to further separate treatment on the WwTP site. The sludge is treated to recover gas (whose energy is used to run the plant), to reduce its volume, and to eliminate pathogens (bacteria and viruses). The level of pathogen reduction from the treatment process (99.9999%) 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. At the Ringsend WwTP the treated sludge is also dewatered or dried to give two final products for transport to storage: a wet 'cake' (26% dry solids) or a dry granular material (92% dry solids). Both of these materials are high in nutrients and are used as soil conditioners and organic fertilisers in agriculture. Both are generically termed 'biosolids', i.e. a fully treated sludge product which is biologically stable, has a low odour and is free of harmful pathogens (viruses and bacteria).

2.3 Policy Background

Biosolids, and activities associated with their treatment, storage or disposal, generally fall under the provisions of Waste Management legislation, most of which stems from EU Directives, the primary one being Directive 2008/98/EC known as the Waste Framework Directive.

Under Article 28 of the Waste Framework Directive, EU Member States are required to draw up waste management plans for their entire geographical area. Waste management planning is the cornerstone of national, regional and local policy on waste management. For the purposes of waste management planning, Ireland is divided into three regions: Southern, Eastern-Midlands and Connacht-Ulster. The Eastern-Midlands Waste Management Plan (EMWMP) was published in May 2015 and is the relevant plan for the purposes of this Report.

The Waste Management Plan (WMP) is a statutory planning document setting out the policies for the development of waste treatment infrastructure and sits on the same planning tier as the city and county development plans. The EMWMP interacts with other statutory and non-statutory waste planning documents including the National Wastewater Sludge Management Plan (NWSMP) adopted in October 2016 by Irish Water.

The quantity of wastewater sludge generated nationally is expected to increase significantly by 2040 as new and upgraded plants are completed to treat our wastewater. The management of this wastewater sludge poses economic, planning and environmental challenges. In order to address these challenges and in line with the strategic objectives of the Water Services Strategic Plan (WSSP), Irish Water developed the first National Wastewater Sludge Management Plan (NWSMP). The NWSMP was subject to an Strategic Environmental Assessment and was issued for public consultation. The plan was formally adopted by Irish Water in October 2016. The NWSMP is recognised as a key component of the EMWMP.

The NWSMP outlines Irish Water's strategy to ensure a nationwide standardised approach for managing wastewater sludge over the next 25 years. This national and sustainable approach to wastewater sludge management will ensure efficiency and ongoing improvements to the benefit of the public and the environment we all live in.

The NWSMP explains that sludge storage facilities will no longer be considered solely on a per-plant or per-county basis. Where appropriate, sludge storage facilities will be developed to serve a number of local plants and/or a wider regional need. It is stated in the NWSMP that the upgrade to the Ringsend WwTP and the proposed GDD WwTP will result in a significant increase from current sludge volumes with a consequent increase in biosolids storage requirements. Therefore, a dedicated biosolids storage facility should be developed in conjunction with the expansion of Ringsend WwTP to meet its requirements and to take account of other future needs in the region.

2.4 Existing Scenario

There are currently 8 large municipal wastewater treatment plants within the Greater Dublin Strategic Drainage Study (GDSDS) area located at: Ringsend, Leixlip, Shanganagh, Osberstown, Malahide, Swords, Portrane and Barnageeragh. Irish Water is also at an advanced stage of planning for a new wastewater treatment plant at Clonshagh (Clonshaugh), known as the Greater Dublin Drainage (GDD) project. Irish Water has considered the biosolids storage requirements for the GDSDS area as a whole.

Biosolids from Ringsend WwTP is currently stored at a facility in Thornhill, County Carlow and there is no further treatment of the stored material. Truck movements from the Ringsend WwTP are via the Dublin Port Tunnel, south along the M50 and south along the M7. The biosolids are then applied to agricultural lands located in south Leinster and parts of Munster. These are the "spread lands". Land spreading occurs mainly during the spring and autumn periods. There is no proposal to move away from these spread lands and it is proposed that the biosolids stored at the proposed RBSF would continue to be applied to those lands during the appropriate times of the year.

Sludge from WwTPs at Swords, Barnageeragh, Portrane and Malahide is removed from those plants and is transported to a facility in the midlands from where it is distributed onto agricultural land after treatment. Sludge from Shanganagh, Lexilip and Osberstown WwTPs all undergo treatment before being applied to agricultural land.

2.5 Proposed Future Scenario

Irish Water has concluded that the preferred strategic approach to providing sludge storage for greater Dublin is to select a site capable of being developed to meet the entire 3.6 million PE demand in the GDSDS region (to 2050). Irish Water proposes applying to An Bord Pleanála for planning approval for development of the facility based on a 20-year design horizon (up to 2040), which requires that the facility can store already treated wastewater sludge from Ringsend and the proposed GDD WwTPs, and wastewater sludge from the other Fingal WwTPs (Swords, Malahide, Barnageeragh and Portrane) giving a total requirement of approximately 3.0 million PE. It is proposed that the wastewater sludge from the Fingal WwTPs would be treated at the proposed GDD WwTP, before being transported and stored at the proposed RBSF. Irish Water will review the storage requirements within greater Dublin in the medium to long term, and develop the proposed RBSF further within the space provided on the selected site if and as required. This further development would require planning consent before it could proceed.

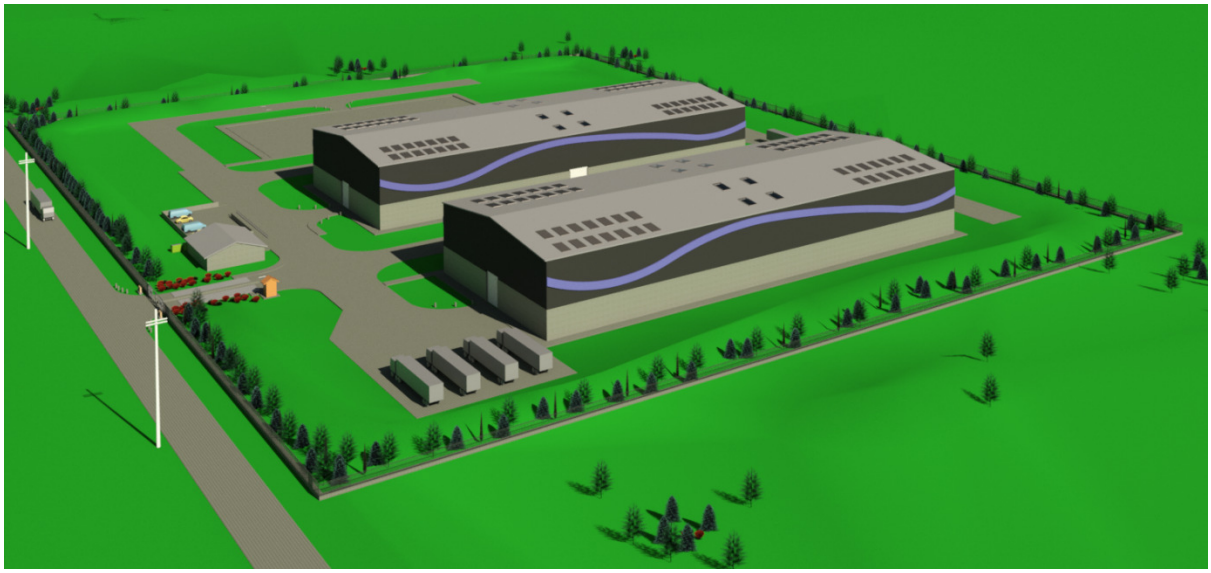

Figure 2 Indicative layout of the proposed Regional Biosolids Storage Facility

In summary, it is proposed to select a site for the proposed RBSF that is capable of storing the biosolids arising from 3.6 million PE, but to seek planning permission only for buildings to cater for a capacity of 3.0 million PE for the 2040 design horizon. An indicative layout of a typical RBSF is shown in Figure 2 and further details are provided in Appendix B.

3.0 Shortlist of Potential Sites

3.1 Introduction

Five sites were identified in the *Stage 2 Report – Identification of Potential Sites*. They are listed in Table 1 and located as shown on Figure 3. These sites were provided for public consultation and following feedback, were assessed to identify a preferred location. The assessment methodology is described in section 4.0 and the findings of the assessment of each site are described in sections 5.0 to 9.0.

Table 1 Shortlist of Potential Sites

Site Name	***Address***
Bracetown/Gunnocks	Bracetown, Dunboyne, Co. Meath
Gunnocks	Gunnocks, Dunboyne, Co. Meath
Greenogue	Collegeland, Newcastle, Co. Dublin
Newtown/Kilshane	Newtown, Dublin 11
Kilshane	Kilshane, Dublin 11

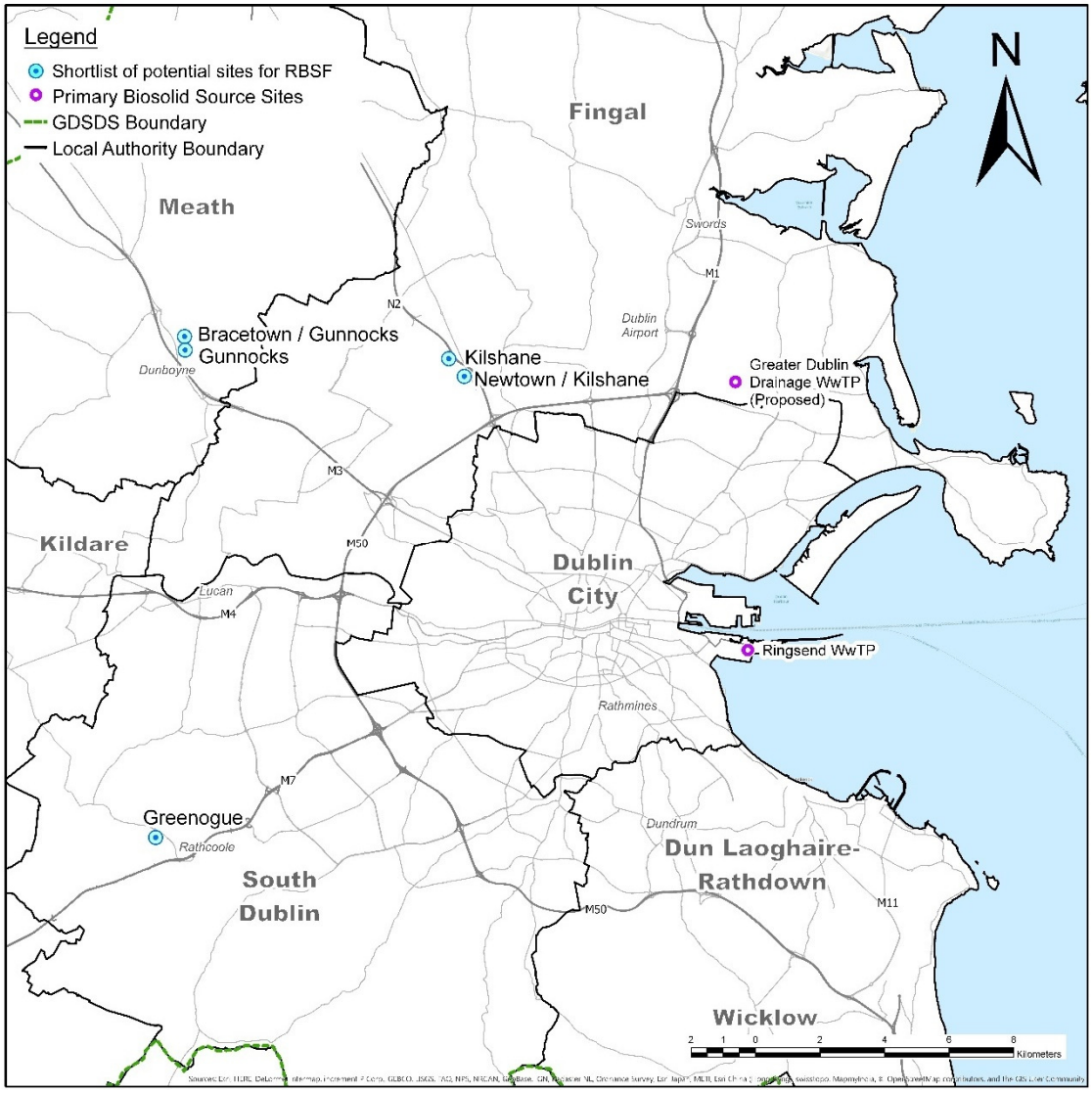

Figure 3 Location of shortlisted potential sites for RBSF

3.2 Bracetown/Gunnocks, Co. Meath

The Bracetown/Gunnocks site is located northeast of Dunboyne town within the townlands Bracetown and the Gunnocks. It is 12.5 hectares in area and situated to the south of Bracetown Business Park and the Hub Logistic Park as shown in Figure 4. The site is bounded to the east by agricultural lands and to the west by the R147 regional road and M3 motorway. The transport routes to and from the site are shown in Figure 4. The site is accessible via the R147 from junction 5 Dunboyne on the M3 motorway, which is approximately 1.5km to the north.

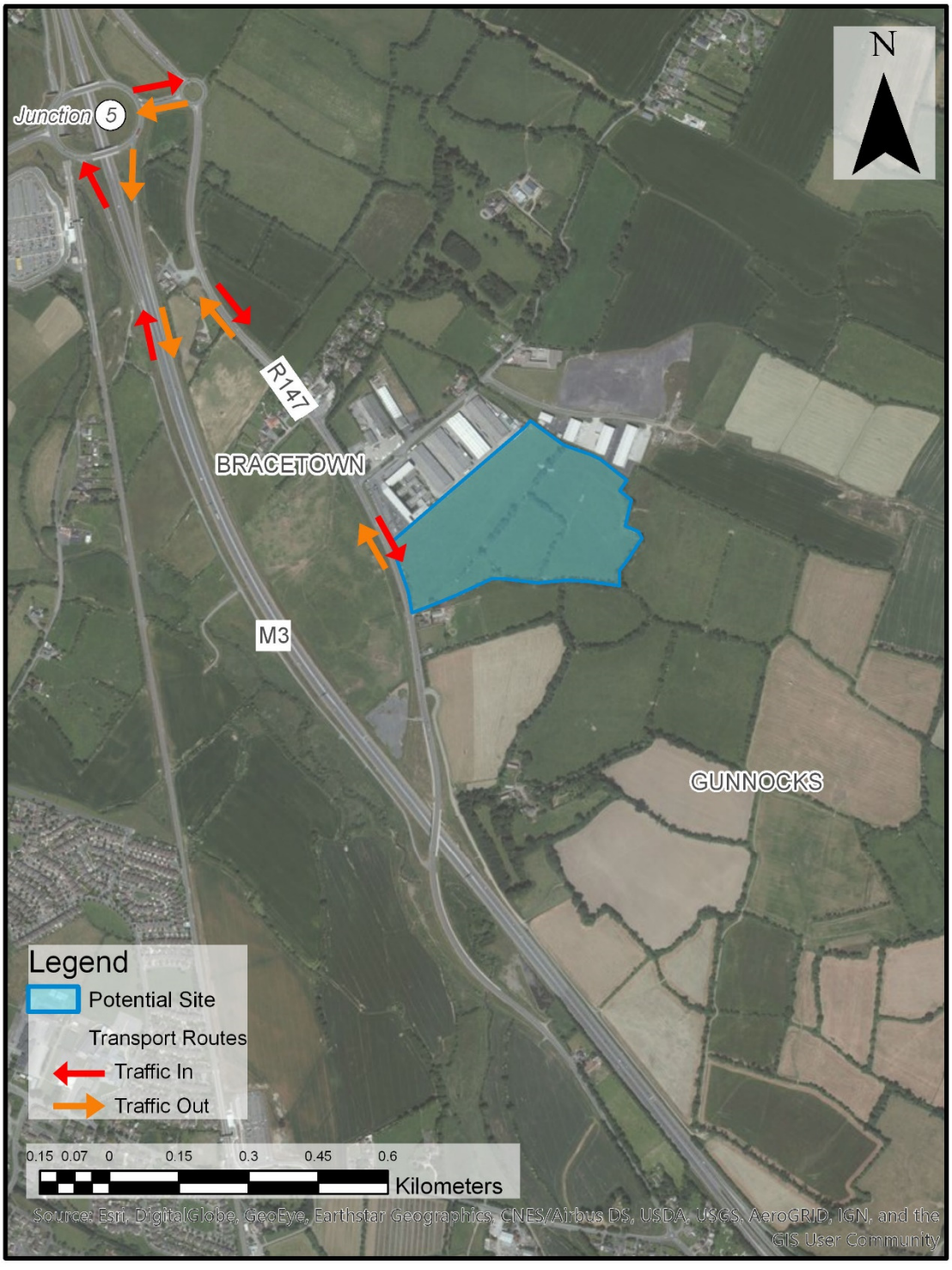

Figure 4 Location of potential site and transport routes at Bracetown & Gunnocks, Co. Meath

3.3 Gunnocks, Co. Meath

The Gunnocks site is located close to Dunboyne town within the townlands of the Gunnocks. It is 14.5 hectares in area and is situated to the south of Bracetown Business Park and the Hub Logistic Park as shown in Figure 5. The site is bounded to the east by agricultural land and to the west by the R147 regional road and M3 motorway. The transport routes to and from the site are shown in Figure 5. The site is accessible via the R147 from junction 5 Dunboyne on the M3 motorway, which is approximately 1.7km to the north of the site.

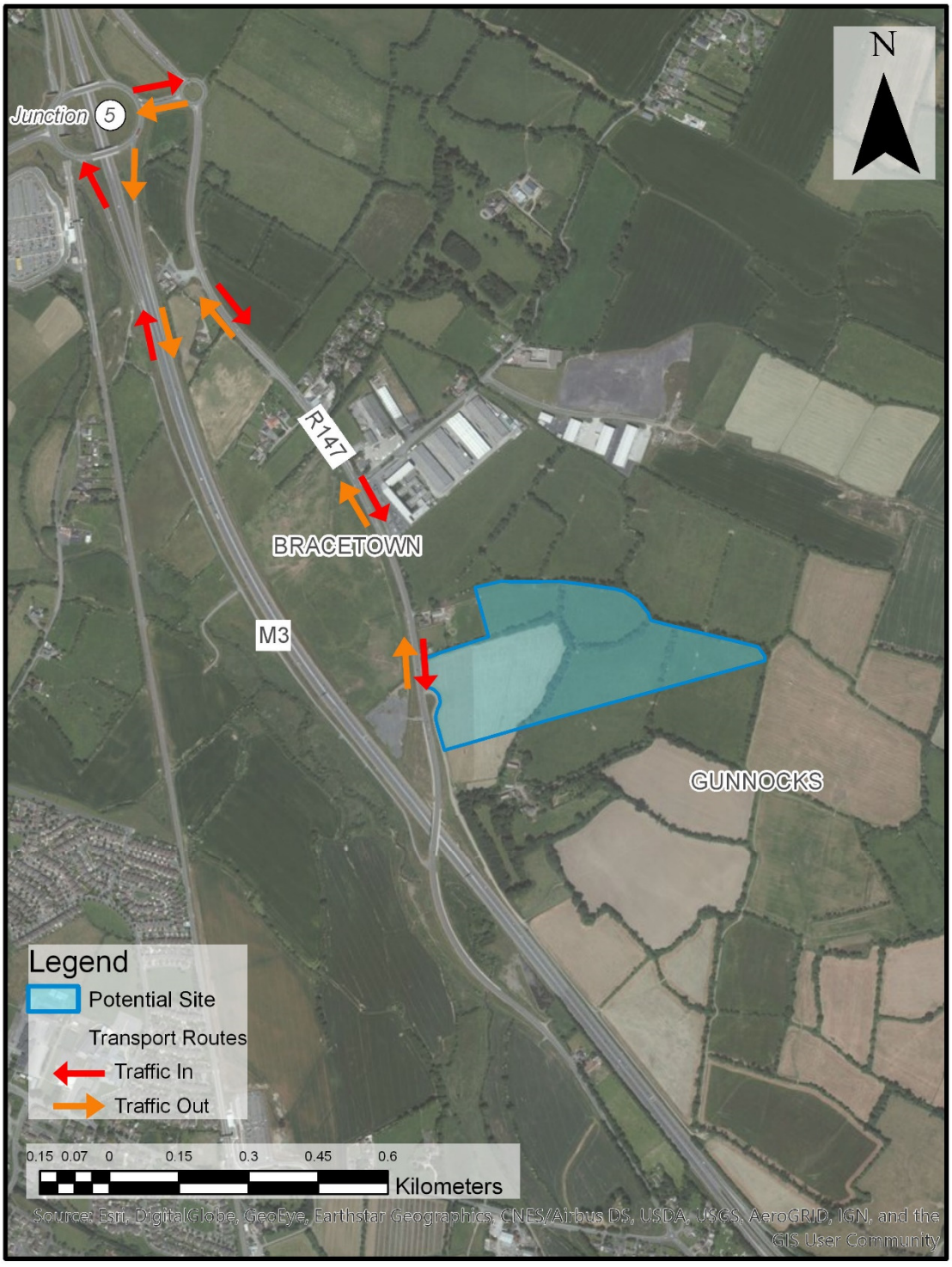

Figure 5 Location of potential site and transport routes at Gunnocks, Co. Meath

3.4 Greenogue, Co. Dublin

The Greenogue site is located in South Dublin between Rathcoole and Newcastle, in the townlands of Collegeland and Commons. The site is 12.5 hectares in area. The Greenogue Business Park is located to the north and Casement Aerodrome, a military airfield, is located to the north-east of the site. The transport routes to and from the site are shown in Figure 6. The site is accessible via the R120 from junction 4 Rathcoole on the N7, which is approximately 1.6km to the south.

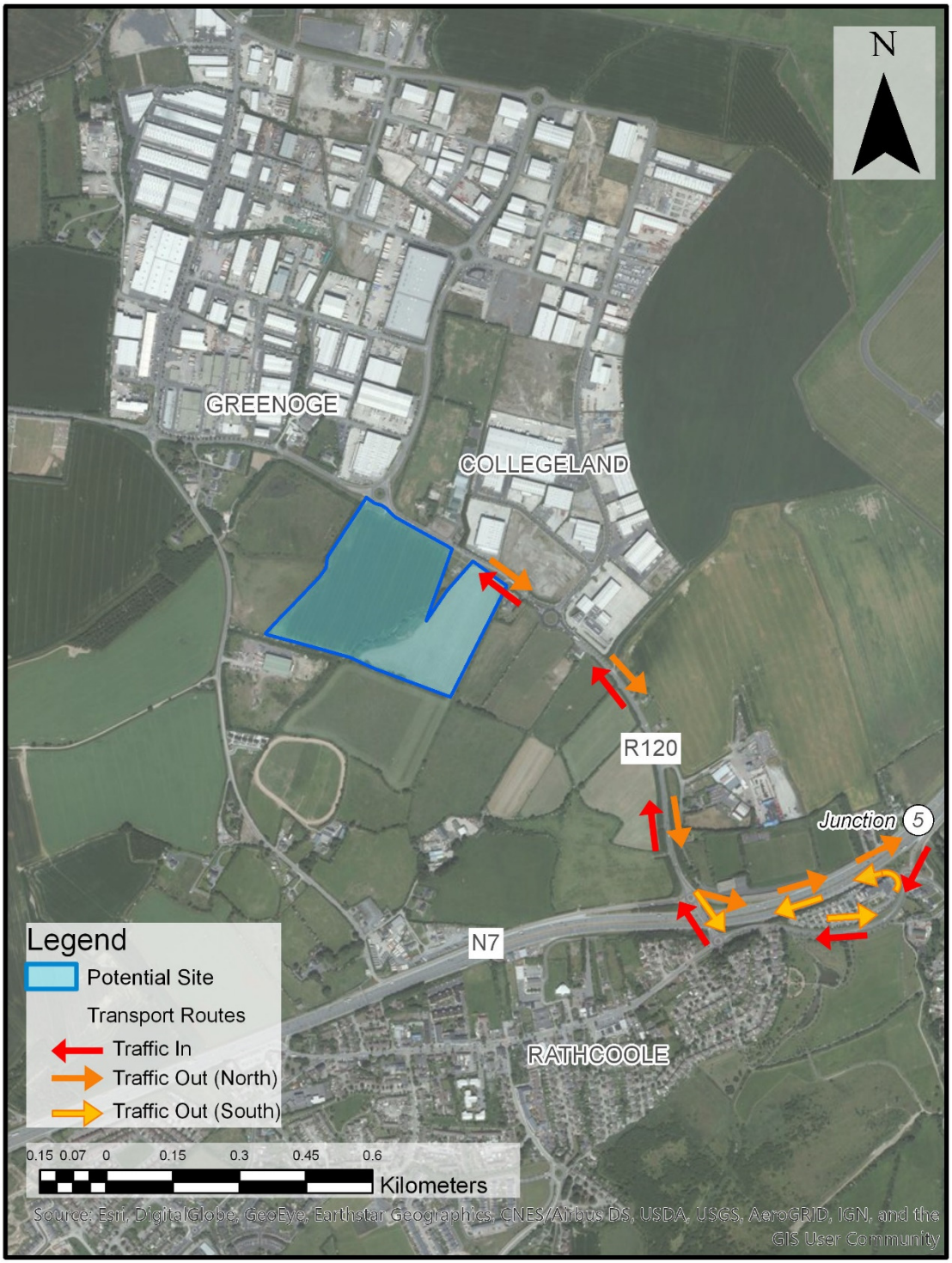

Figure 6 Location of potential site and transport routes at Greenogue, Co. Dublin

3.5 Newtown/Kilshane, Dublin 11

The Newtown/Kilshane site is located adjacent to the N2 national primary road and within the townland of the Newtown. It is 11.4 hectares in area is situated to the east of Roadstone Quarry and to the northeast of Huntstown power station as shown in Figure 7. It is accessible via the R135 regional road from an exit on the N2, which is 0.7km to the south. Vehicles returning towards the M50 motorway, access the N2 from junction 2 St. Margaret's, some 0.7km from the site.

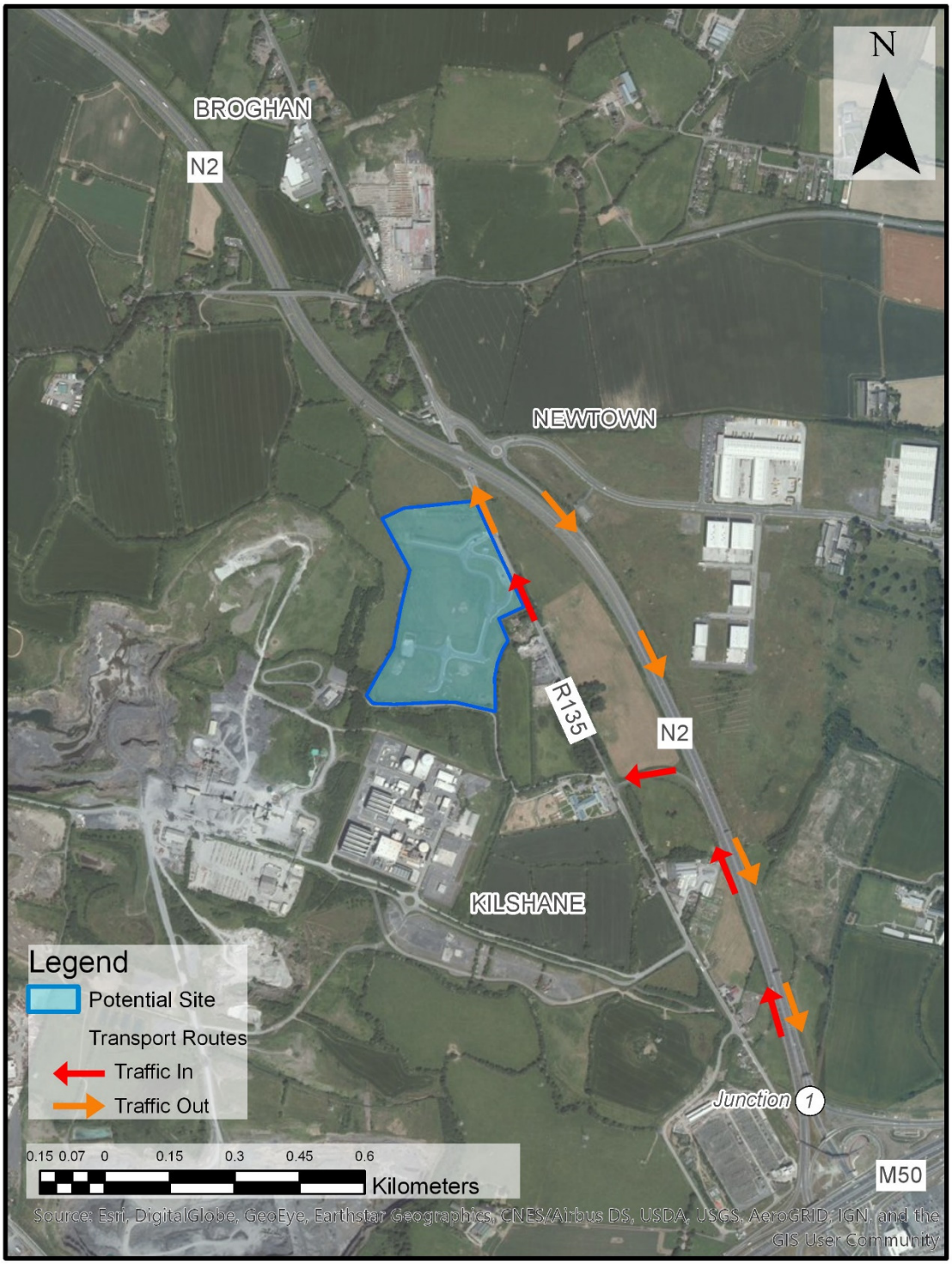

Figure 7 Location of potential site and transport routes at Newtown & Kilshane, Dublin 11

3.6 Kilshane, Dublin 11

The Kilshane site is located adjacent to the N2 national primary road and within the townland of the Kilshane. It is 11.3 hectares in area and is shown in Figure 8. The site is situated to the north of Roadstone Quarry and Huntstown power station. It is accessible via the R135 regional road from an exit on the N2, which is 1.7km to the south. Vehicles returning towards the M50 motorway, access the N2 from junction 2 St Margaret's, some 1.2km from the site.

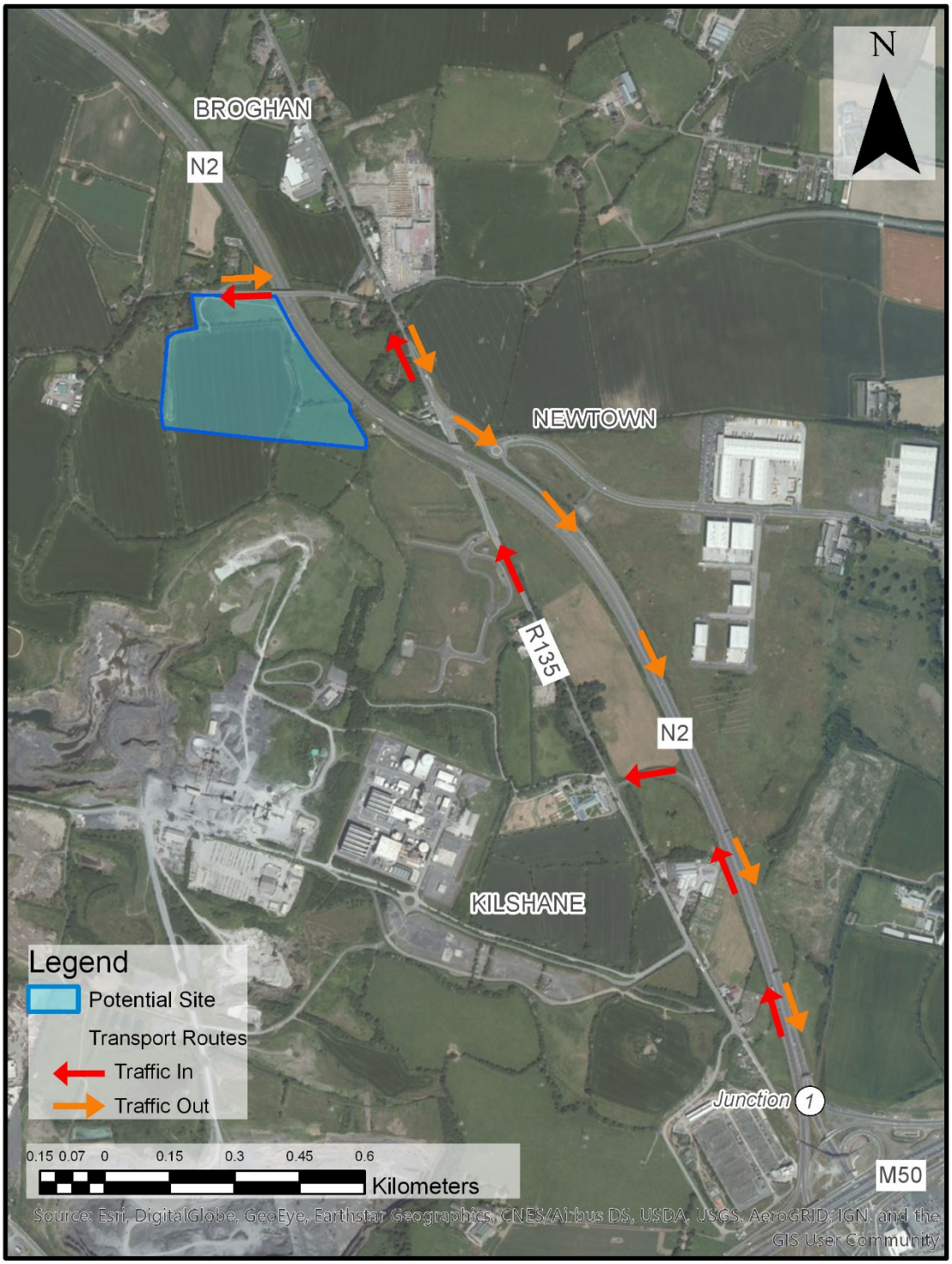

Figure 8 Location of potential site and transport routes at Kilshane, Dublin 11

4.0 Assessment and Site Selection Methodology

4.1 Introduction

The proposed methodology by which a suitable site will be selected for the RBSF was first set out in the *Stage 1 Report – Site Selection Methodology,* which was published by Irish Water on 2 February 2017. That report provided the background to the project and explained the proposed methodology in general terms for shortlisting potentially suitable sites.

Irish Water requested feedback on the proposed selection process during the four-week consultation period that followed the publication of the Stage 1 Report. The received feedback was considered and a shortlist of potential sites was identified. The sites and details of the methodology adopted in selecting them was provided in *Stage 2 Report – Identification of Potential Sites,* published on 11 May 2017.

The selection process for Stage 2 involved a Scoping Phase followed by a Shortlisting Phase. The objective of the Scoping Phase was to identify suitable areas, in general terms, within the GDSDS region. Environmental designated areas were ruled out and land use zoning considered suitable for the development were selected for further consideration. The primary source sites for biosolids, existing waste facilities and sites suggested during consultation were also investigated for suitability.

The suitable areas identified in the Scoping Phase were then subjected to assessment at the Shortlisting Phase. The Shortlisting Phase was structured into a sequential process involving 8 steps. Less suitable sites, in terms of specific criteria set out at each step, were eliminated from the process until a final shortlist was arrived at.

4.2 Stage 2 Consultation Submissions

A second phase of non-statutory public consultation for the proposed RBSF was conducted over four weeks from the 11 May 2017 until 15 June 2017. The concerns and issues raised by all stakeholders were reviewed and collated by the project team and documented in the Stage 2 Consultation Report which is enclosed in Appendix A herein. The consultation phase included 3 open days held at locations near the potential sites.

The submissions received during the Consultation process comprised feedback from local authorities, state agencies, community groups, commercial organisations and individuals. Submissions were received during the consultation process and these are categorised under the following headings and subheadings:

- Project Need
- Site Selection Methodology
- Economic Considerations
- Planning Considerations
- Cumulative Impact
- Alternatives
- Biosolids & Storage
- Agronomy
- Environment
    - Air Quality
    - Health
    - Soils, Geology & Hydrogeology
    - Water
    - Visual Impact
    - Noise
    - Archaeology
- Traffic
- Operation of The Facility

- Communication & Consultation

The project need and decision to develop a regional facility, as opposed to alternative options, is based on the strategy stated in Irish Water's *National Wastewater Sludge Management Plan* (NWSMP). The NWSMP, published in 2016, was subject to an Strategic Environmental Assessment (SEA). The Plan sets out Irish Water's strategy for managing wastewater sludge and biosolids over the next 25 years. In accordance with the objectives of the NWSMP, a RBSF is to be developed for storage of biosolids serving the WwTPs for the greater Dublin region.

There were further submissions relating to the site selection process and suggested approaches to the selection methodology. This feedback has been considered and incorporated, where appropriate, into the methodology adopted for identification of the preferred site during Stage 3. The details of the methodology are explained the following sections. Consideration of planning regulations in the site selection methodology is explained in section 4.6 and the findings are detailed in the dedicated planning sections throughout this Report.

Further details of the design of the RBSF and future procedures for operation will be provided in the Environmental Impact Assessment Report (EIAR) and potential impacts of the proposed design at the preferred site will be assessed in accordance with EPA and EU requirements. Control measures will be implemented at the site to ensure that odour does not give rise to nuisance at the site boundary. Noise during operation will be limited to levels set out in best practice guidance. Buildings will be set back from the site boundaries and landscaping will be provided to screen the buildings from neighbouring areas. Haulage trucks will be covered to contain biosolids as it is delivered to or away from the site and all loading and unloading will occur within the storage buildings. The buildings on site will store material for three to four months before it can be sent to spread lands for use as a soil conditioner or fertilizer. No treatment will take place at the RBSF.

The use of biosolids in agriculture is governed primarily by two main pieces of legislation, both of which implement aspects of various EU Directives:

- the Waste Management (Use of Sewage Sludge in Agriculture) Regulations, 1998 as amended, (these regulations implement the EU's Sewage Sludge Directive in Ireland); and
- European Union (Good Agricultural Practice for Protection of Waters) Regulations 2014.

Feedback was received in relation to a number of environmental topics and potential impacts on sensitive receptors was also raised during consultation. This feedback was considered, and incorporated, as far as practicable, in the Stage 3 site selection methodology. Sensitive receptors, in terms of the relevant potential environmental impacts, were considered. The methodology is described in the following sections of this Report. Furthermore, potential impacts of the proposed RBSF at the preferred site will be provided in the Environmental Impact Assessment Report (EIAR) and will be assessed in accordance with EPA and EU requirements.

Traffic was the subject of submissions relating to all five potential sites. Section 4.5.1 explains how this feedback was taken on board in the site comparison assessments. Traffic volumes, to and from the proposed RBSF, is dependent on the spreading seasons for biosolids and thus will vary throughout the year. Traffic will be greater in the spring and autumn time when there will be demand for biosolids, as a soil conditioner and fertilizer, on agricultural lands. Traffic levels will be lower in winter months, when spreading of biosolids is not permitted, and in the summer growing season.

As part of the terms of reference of the Stage 2 consultation, Irish Water requested feedback on how the project can better communicate with stakeholders and members of the public. Feedback was provided on a number of aspects of the consultation process and Irish Water will address a number of these suggestions as part of the Stage 3 consultation period. In addition to continuing to make project reports publicly available, increased efforts will be made to promote the consultation process and facilitate engagement with the project team. A letter drop to the neighbouring areas of the preferred site will be extended to include a greater number of stakeholders and key community facilities not already identified will be contacted directly to increase awareness. Venues for information events will be assessed to ensure that they are easily accessible and the finish time of information events will be extended to make attendance easier. As at the previous stages of the project, all relevant elected representatives will be contacted at the commencement

of the consultation to ensure that they are aware of the project and can, in turn, encourage constituents to engage as part of the consultation.

4.3 Assessment Methodology

The site selection methodology involved assessing sites under multiple environmental and technical criteria. The selected criteria and specialist assessors for each assessment criterion are summarised in Table 2 below. The criteria are in line with the proposed criteria and headings explained in the Stage 2 Report. They are based on environmental guidance published by EPA, assessment methodologies adopted by Transportation Infrastructure Ireland (TII) for roads and motorway service area projects, and specific requirements for biosolids storage as outlined in the National Wastewater Sludge Management Plan. Feedback received during consultation has also been considered in selecting the criteria.

Assessments involved both desktop studies and visual inspections of the potential sites. It was originally intended that the assessments for Ecology and Landscape & Visual would involve visits to the five potential sites. However, access could not be arranged for some of the sites. In order to assess all sites equally, it was decided that the assessment team would not enter any of the sites. Visual inspections were therefore carried out from the boundary of each site and from other suitable vantage points. Given the assessments were for the purpose of site selection, it was considered that such inspections were adequate in the circumstances.

Table 2 Assessment Criteria and Assessors

Assessment Criteria	***Assessor***
Environmental	
• Air Quality	AWN Consulting
• Odour	Royal Haskoning DHV
• Noise	AWN Consulting
• Landscape & Visual	Brady Shipman Martin
• Geology & Hydrogeology	J.B. Barry & Partners
• Hydrology	J.B. Barry & Partners
• Ecology	Natura Environmental Consultants
• Archaeology, Cultural & Architectural Heritage	Dr. Charles Mount
Economic & Engineering	
• Traffic	J.B. Barry & Partners
• Road Safety	
• Service & Utility Connections	
• Geotechnical	
• Distance from Biosolids Source	
• Capital & Operating Costs	
Planning	
• Land Use Zoning	Stephen Little & Associates
• Planning Policies & Objectives	
• Planning History & Current Usage	
• Population & Sensitive Receptors	
• Adjacent Land Use	
Social & Community	
• Material Assets	J.B. Barry & Partners
• Neighbourhood Character	

The overall assessment of the potential sites for the RBSF and the selection of the preferred site is based on advantages and disadvantages of the potential sites in relation to each other in accordance with the environmental and technical criteria. This comparative assessment allocates either *More Favourable*, *Less Favourable* or *Neutral* classifications to each site for the criteria identified. For each of the criteria, a qualitative approach was adopted and therefore expert judgement was applied in determining classifications. The

selection of the final preferred site is based on a cumulative consideration of the classifications. Table 3, below, shows the classifications applied to compare specific site characteristics.

Table 3 Classifications for Comparative Assessment of Sites

4.4 Environmental Criteria

4.4.1 Air Quality

In the assessment of air quality, the impact of traffic during the operation of the proposed RBSF and construction activities was considered. The assessment of impact on air quality due to traffic is based on guidance provided by *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (TII, 2011). The assessment involves air dispersion modelling to determine an index of change in overall exposure. Typically, inputs to the air dispersion model consist of road layouts, receptor locations, annual average daily traffic movements (AADT), percentage heavy goods vehicles, annual average traffic speeds and background concentrations. However, in the early stage of the assessment it became apparent that, based on the guidance, the estimated traffic volumes for the proposed development were not significant enough to warrant assessment through modelling. It was ascertained that for all sites traffic-derived pollutants would be negligible with an overall insignificant impact on air quality.

The assessment of impact on air quality during the construction phase of the proposed development is based on *Assessment of dust from demolition and construction* (IAQM, 2014). While construction dust tends to be deposited within 200m of a construction site, the majority of the deposition occurs within the first 50m. According to IAQM guidance, a development such as the RBSF would be defined as minor-scale with the potential for nuisance dust soiling effects within 25m of the dust generating activity with standard mitigation measures in place. However, a conservative approach is taken with this assessment and all sensitive receptors within 50m of the five potential sites were considered. The factors that can affect dust deposition levels include site activities, rainfall, wind speed and direction, activities in the surrounding region and proximity to roads.

While a conservative approach was taken for the assessment, it is worth noting that construction dust impacts can be mitigated using best practice measures during the construction phase of the project at any of the proposed sites.

4.4.2 Odour

Submissions were received during consultation in relation to concerns about the potential odour generated at the facility. Odour control measures will be designed and fully implemented at the proposed RBSF to avoid any odour nuisance to nearby receptors. The assessment methodology and the potential effects described in this Report is for purposes of site selection. The assessment considers, conservatively, odours without controls in place.

The assessment of the potential risk of odour effects was carried out using the methodology provided in *Guidance on the Assessment of Odour for Planning* (IAQM, 2014) combined with additional detailed analysis of both the number and locations of receptors and a detailed review of meteorological conditions.

The methodology consisted of a predictive, qualitative risk-based assessment based upon the Source-Pathway-Receptor concept. This means that the risk assessment accounted for the likelihood of exposure combined with the effect on the receptor if the exposure took place. The assessment was carried out in accordance with three main steps of the IAQM guidance, as detailed below:

- Step 1 - Evaluation of the potential for odour release from the sources, including the magnitude of odour release, and unpleasantness of the odour;
- Step 2 - Determination of the pathway effectiveness of the odour from source to receptor, including the distance, the frequency of winds from the source to receptor, release parameters and the topography and terrain between the source and receptor; and,

- Step 3 - Identification of receptor sensitivity, which will consider the level of amenity to be expected at the site, and the duration that people would reasonably be expected to be present at the site.

A high level review of the potential baseline conditions at the sites was also conducted. This comprised a desktop review of each location to identify any existing odour sources that may have the potential for cumulative impacts with the RBSF. The review did not identify any large scale industrial, waste or wastewater processes in the vicinity (500m) of any of the five potential site options. This assessment therefore assumed that there is no difference in the baseline odour conditions at any of the RBSF site options.

At the early stage of assessment, it was determined the potential for odour release from source was the same for all potential sites. The proposed RBSF will store two types of biosolids - dewatered wet 'cake' and dried granular material, both of which have the potential to generate odours. The material will be transported in covered trucks and all sludge loading/unloading and handling will be conducted within the enclosed RBSF building. Odour from the stored material will potentially be greatest immediately after its production, when the material has both its highest moisture content and availability of biodegradable material. With appropriate storage, the moisture content and availability of biodegradable material are both likely to reduce as the age of the material increases. Disturbance of the material may also increase localised odour emissions; this could occur during loading/unloading activities or during any movement of material for internal stockpiling or storage purposes.

Odour monitoring of fresh biosolids (created within hours of odour sampling) was undertaken in August 2016. The samples were tested for their hedonic tone, a measure of pleasantness. At concentrations, comparable to commonly used odour assessment criteria, i.e. less than 10 $ou_E\ m^{-3}$, the maximum result was deemed to be moderately unpleasant. Using the IAQM odour guidance, the odour potential of the RBSF is classified as 'Large'. This is a conservative classification and does not take account of the odour control system which will be installed in the proposed buildings to treat and remove offensive odours.

The risk of odour impacts at the proposed receptor locations, for a scenario where no mitigation has been provided, was categorised based on the pathway effectiveness and the source odour potential. The assessment considered the number of receptors within 250m and 500m of the site boundary to provide an indication of potential public exposure. The source odour potential and pathway effectiveness were then considered together to predict the risk of odour exposure (impact) at the proposed receptors with consideration for receptor sensitivity.

However, it is important to note that odour control measures will be designed and fully implemented at the proposed RBSF to avoid any odour nuisance to nearby receptors.

The assessment considered that all residential dwellings have a high sensitivity to odour impacts while industrial/warehousing/employment uses have a medium sensitivity to odour impacts. The risk assessment was conducted based on the most sensitive receptor within the study area. The potential sites were ranked based on the significance of the predicted overall effect. The comparative assessment is explained in section 10.2.2.

4.4.3 Noise

Submissions were received during consultation in relation to concerns about the noise generated at the facility. The operational noise levels at the RBSF will be limited in accordance with the most appropriate guidance for a development of this type. Nevertheless, a comparative assessment was undertaken for the five potential sites.

An assessment of the potential impact of each site in terms of noise during operation was undertaken based upon the sensitivity of noise sensitive receptors as well as a determination of the potential impact of each site based on the number and quantity of noise sensitive receptors located nearby. Sensitive receptors were considered to include residential dwellings, schools, healthcare facilities, retirement homes and churches. For this assessment, no further distinction was made between these different types of receptors.

The potential impact of each site was determined by calculating the number of receptors within fixed distance bands of the site boundary, and allocating a score based on the quantity of receptors within different distance bands, up to 300m, from the site boundary. This approach is based on the procedure outlined in *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* (TII, 2004). Although this document

relates to the assessment of national road schemes, the methodology is considered appropriate for this selection process. This information was then used to establish a Potential Impact Rating (PIR) for each site in accordance with the TII guidelines.

The sensitivity of noise sensitive receptors in the vicinity of each site was determined by reference to the noise contour maps produced in accordance with the requirements of the Environmental Noise Directive (END), EC 2002/49/EC (transposed into Irish Law by the Environmental Noise Regulation 2006, S.I. 140/2006.

4.4.4 Landscape & Visual

The landscape and visual characteristics of the five sites were considered in terms of their relative capacity to accommodate the proposed development.

The landscape context and character of each shortlisted site was considered, including its topography, vegetation, particular landscape features, degree of openness or enclosure, and the nature of adjoining or nearby land uses. The Landscape Planning context was also reviewed by reference to the relevant County Development Plan, and including identification of designated Landscape Character Areas, the presence of any designated scenic routes, protected views and prospects, nearby landmarks or recorded monuments, and other landscape policies and objectives that might inform the nature or scale of potential development at each of the sites.

4.4.5 Geology and Hydrogeology

In the assessment of geology and hydrogeology the underlying geological and hydrogeological attributes (aquifer classification, vulnerability, karst features) and the proximity to sensitive groundwater receptors (NHAs, and major groundwater users), along with their importance, were determined for the potential sites.

The aspects of the proposed development that have the potential to impact on the geological and hydrogeological environment were then examined. These aspects include activities during construction and operation of the facility.

Each site was assessed to determine which of the sites would provide the least impact on its geological and hydrogeological settling comparatively with the other potential sites.

The potential impacts on the geological environment were considered in terms of sensitive geological receptors, which included:

- Geology/Quarries
- Karst
- Soils
- Geological Heritage
- Landfill/Contaminated Land

In considering the implications of the proposed development on the hydrogeological environment, the potential sites and their environs were considered in terms of potential impacts on the groundwater regime (flow and quality). This assessment considered:

- Aquifer Classification
- Aquifer Vulnerability
- Public /Group Scheme Abstractions
- Groundwater Dependent Terrestrial Ecosystems

The soils, geology and hydrogeology information was obtained from spatial mapping published by Geological Survey of Ireland (GSI) and site investigation information where it was available.

The overall impact on the geological and hydrogeological environment was determined following a qualitative assessment of all of the above-mentioned aspects combined.

4.4.6 Hydrology

Submissions were received during consultation in relation to concerns about flooding at, or near, the five potential sites. The hydrology assessment included a thorough review of flooding history at all sites and considered the potential impact of flood risk following the proposed development.

The assessment was a desk-based study to compare the suitability of each site in terms of its hydrology. This involved a collation of existing hydrological information of each site in order to identify, quantify and assess its potential hydrological impacts on the potential sites and surrounding lands. This assessment comprised the following criteria:

Potential Flood Risk – Each site was assessed for flood risk relating to coastal, fluvial, pluvial, groundwater and artificial drainage systems. The Flood Zone criteria from *The Planning System and Flood Risk Management, Guidelines for Planning Authorities* (OPW, 2009) were used to identify the flood zones of the potential sites. Data required for the potential flood risk assessment was obtained from the following sources:

- Preliminary Flood Risk Assessment (PFRA) maps obtained from www.cfram.ie
- Meath County Council Strategic Flood Risk Assessment 2013-2019
- South Dublin County Council Strategic Flood Risk Assessment 2016-2022
- Fingal County Council Strategic Flood Risk Assessment 2017-2023

Potential Drainage Discharge – The greenfield runoff rates for each site were initially estimated using the method from *Report 124* (The Institute of Hydrology). Information obtained from the *Flood Studies Update Web Portal* was used in conjunction with contour levels obtained from www.gsi.ie to assess the existing drainage regime of the site. Nearby watercourses were identified at each site and examined as potential drainage discharge locations. The conveyance capacity of the watercourse and the feasibility of constructing a potential outfall were considered.

Potential Downstream Flooding – The potential to increase flooding downstream of the potential sites due to the proposed development was considered. Historic flood data of each site was obtained from the *National Flood Hazard Mapping* website (www.floodmaps.ie) in order to identify any historic floods occurring in the area. The loss of flood plain storage and the consequence on flooding downstream was also considered.

The overall hydrological assessment was determined following a qualitative review of these combined criteria.

4.4.7 Ecology

The ecology of the five potential sites was assessed and compared using methods based on *Best Practice Guidance for Habitat Survey and Mapping* (Smith *et al.* 2011) and habitats were classified according to *A Guide to Habitats in Ireland* (Fossitt 2000). At each site, habitat types were identified by observation from the perimeter of the sites on 2nd June 2017. Attention was given to treelines, mature tree species and hedgerows bordering and throughout the sites. Watercourses in the surrounding areas were also investigated, especially in relation to drainage from the sites. Salmonid rivers were identified by reference to *Rivers of Ireland: a flyfisher's guide* (O'Reilly, 2009) and feedback submitted by Inland Fisheries Ireland (IFI) through consultation. Large scale aerial photographs of the sites were also carefully examined to measure the area for various habitat types. Through this assessment the importance of habitats was compared for the potential sites.

A comparative evaluation of the potential of habitats present for various fauna groups was undertaken using remote methods. On-site surveys for signs of large mammals and bat activity were not carried out because the sites were not accessible and surveys for breeding birds were not assessed due to seasonal constraints.

The relevant habitat classifications, as defined in *A Guide to Habitats in Ireland,* are referenced within parentheses for each site in sections 5.0 to 10.0.

4.4.8 Archaeology, Cultural & Architectural Heritage

The assessment of cultural heritage was a desk-based study. It involved a collation of existing written and graphic information in order to identify the archaeology, cultural & architectural heritage potential of the

potential sites and the area in the vicinity of each. The methodology is based on the *Environmental Impact Assessment of National Road Schemes – A Practical Guide* (National Roads Authority, 2008) and *Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes* (The National Road Authority). The overall study area for the potential sites extended 0.2km from the site boundaries.

The records and documents examined for the assessment were as follows:

- Record of Monuments and Places (RMP) for County Dublin and County Meath;
- The Archaeological Survey Database (SMR);
- The Record of Protected Structures in the County Development Plans;
- The National Inventory of Architectural Heritage;
- Aerial photographs;
- Excavation reports; and
- Cartography.

It is not possible to definitively rule out the potential for the presence of sub-surface archaeological features at each potential site. A geophysical survey and archaeological testing are required for this and these will be carried out when the preferred site has been identified.

4.5 Economic & Engineering Criteria

4.5.1 Traffic

Submissions were received during consultation in relation to concerns about additional traffic generated at the facility and its impact on roads in the area of the potential sites. The assessment of traffic at the potential sites involved determining the potential impacts of vehicles arriving and leaving the proposed RBSF during its operation. The assessment was based on guidance provided in the following publications:

- NRA Traffic and Transport Assessment Guidelines;
- TII Standards and Technical Publications;
- TII Automatic Traffic Counter Statistics; and
- RSA Ireland Road Collisions Counter Statistics.

The assessment commenced with a review of the site plans for each site. Suitable entrance points for each site were determined with the engineering team. The potential sites were visited to inspect the local road network near each site. The junctions and roads considered most likely to be impacted by traffic movements associated with the proposed RBSF were assessed in terms of suitability and road safety.

In response to concerns raised during consultation, the assessment was expanded to include additional traffic surveys. Existing traffic volumes on the adjoining roads and junctions were surveyed at eight separate junctions between 7am and 7pm at the potential sites. The surveys took place on the same date, 1st June 2017. The measured data was used to assess and compare potential impacts and to support observations by traffic engineers of traffic patterns at the sites, which were carried out during a number of visits.

The following criteria were examined in the assessment of traffic at each of the potential sites:

Access - Visibility at these concept access junctions was analysed and compared with the desirable minimum distance based on the existing speed limit on the adjoining road.

Traffic Volumes - The Annual Average Daily Traffic (AADT) was estimated from traffic counts undertaken on the surrounding road network. The AADT was then compared to the capacity of the road network to determine the locations where reserve capacity was available on the road network.

Operation of surrounding junctions - Junction modelling software was utilised to estimate the Ratio of Flow to Capacity (RFC) and the maximum queue length on each arm of the junctions on the road network surrounding the potential sites.

4.5.2 Road Safety

A Road Safety Impact Assessment (RSIA) as per *PE-PMG-02001* (TII) was undertaken for the RBSF. The RSIA considered the safety implications of the proposed development at each of the potential site locations. The following factors were considered in the assessment:

Geometry and visibility – Site accesses which require steep gradients and/or have restricted visibility can result in conflicts with mainline vehicles and will be less favourable than accesses with flatter gradients and unrestricted visibility.

Proximity to junctions – Sites located near existing junctions may result in rear-end type collisions, therefore sites which are located remote from existing junctions will be preferable from a safety perspective.

Horizontal and vertical curvature – collision frequency increases at crests and dips, and embankments/cuttings or bridge abutments may impact forward visibility to the merge/diverge, therefore sites located on straighter/flatter/at-grade sections of mainline are considered preferable.

Roadside features – sites located near existing roadside features, such as culvert headwalls or attenuation ponds which may present a hazard will be less preferable to those sites where no such hazards exist.

Submissions were received during consultation in relation to concerns about traffic safety and it was suggested collision data should be reviewed as part of the site selection process. As part of the road safety assessment, the Road Safety Authority (RSA) database for road collisions was reviewed.

4.5.3 Service & Utility Connections

Each of the candidate sites were assessed in terms of the availability of the following utilities required to service the proposed RBSF:

- Wastewater discharge;
- Surface water discharge;
- Potable Water supply;
- Electricity supply; and
- Telecommunications supply.

The assessment involved a review of the Irish Water records to assess the availability of the watermain and wastewater connections in the area. Local authority engineers were also consulted to gather local knowledge and further information on the most appropriate connection for each potential site, and on surface water (storm) sewers, where appropriate.

Records from ESB were reviewed in relation to electricity supply.

Where it was found that sewers or watermains were not available near candidate sites, alternative solutions for drainage discharge and water supply were considered. Typical solutions can include on-site treatment of wastewater, construction of additional sewers for drainage disposal, abstraction of groundwater for potable water supply, installation of booster pumps to satisfy potential fire requirements. If there was potential for alternative solutions, the complexity in achieving them was considered in the overall comparative assessment of the candidate sites.

4.5.4 Geotechnical

The five proposed sites were reviewed in relation to the engineering properties of the ground material present at each of the sites.

If soft ground is present at a site, this would result in excavation of the poor material and replacement with suitable fill. The poor material would also require removal off site or disposal in berms within the site. If rock is present at the site, excavation of rock would require additional time and effort. If karst is identified, this would produce an engineering challenge, requiring additional site investigation to fully establish the issues and corresponding solutions.

The assessment was based on information available from the GSI mapping website and supplemented by site investigation information where it was available.

4.5.5 Distance from Biosolids Source

Locating the proposed RBSF near the main biosolids load sources is more sustainable and would provide the greatest flexibility in respect of future outlets for biosolids. The majority of biosolids material stored at the RBSF will originate from Ringsend WwTP and the proposed GDD WwTP at Clonshaugh. A centre point representing the load source was selected on the road network between the Ringsend and GDD WwTP, positioned closer to Ringsend to reflect the estimated larger proportion of biosolids material that will originate there. Distances were measured along the transport routes from this centre to each of the candidate sites. In terms of this criterion, the sites closest to the load source were deemed more favourable.

4.5.6 Capital & Operating Costs

The assessment of capital and operating costs of the development at the potential sites involved the determination of a Base Cost order of magnitude for a notional site, referred to as the Base Cost Site. The Base Cost Site is a very low risk proposition site that requires minimum fill and that has appropriate utility connections in close proximity. The Base Cost Site was also considered as a site where no additional unforeseen work is required, the topography is relatively flat and minimal accommodation works are required. The Base Cost only addresses site development works because the cost of building construction is not expected to differ significantly between the potential sites. The Base Cost was adopted as the cost comparator for the five potential sites.

The Base Cost was derived using a recent TII database schedule of rates (February 2016) and these rates were applied to estimated quantities, derived from the design details provided in the Stage 2 Report and experience from recent projects of a similar scale and nature.

The potential sites were then individually assessed and an addition or deduction from this Base Cost was established. The assessment comprised of visual inspection of the sites, an inspection of design information provided in the Stage 2 Report and an assessment by the engineering design team. The findings, which are summarised for each site in section 5.0 to section 9.0, resulted in either a cost addition or a cost reduction from this Base Cost for each site. The five potential sites are compared with one another in section 10.0.

Operating costs were also assessed for each site. Operating costs for buildings and staff will be generally the same regardless of location. Transport costs were identified as a differentiating factor. It will be less costly to transport biosolids from the main biosolids sources at Ringsend and Clonshaugh (GDD) to the sites closest to them.

4.6 Planning Criteria

4.6.1 Land Use Zoning

The land use zoning for the potential sites was determined from a review of the zoning maps and written statements of the relevant Local Authority County Development Plan. The development plans are summarised in Table 4 below. The maps were cross referenced with the written statement to provide an overview of the parameter of the specific zoning for the candidate site. Consideration was given to the uses outlined which closely described the activities of the RBSF (e.g. Waste Recovery and Disposal). Zonings which suggested these uses were 'permitted in principle' were deemed most appropriate.

Table 4 County Development Plans

Potential Sites	***Planning Document***
Bracetown/Gunnocks	Meath County Council Development Plan 2013 – 2019
Gunnocks	
Greenogue	South Dublin County Council Development Plan 2016 – 2022
Newtown/Kilshane	Fingal County Development Plan 2017 – 2023
Kilshane	

4.6.2 Planning Policies & Objectives

An assessment was carried out of the Zoning Maps contained in the relevant City/County Development Plan to identify any map based objectives. An assessment of the Written Statement was carried out to identify the appropriate policies or objectives specific to the candidate site.

4.6.3 Planning History & Current Usage

In assessing the planning history and usage of a candidate site, planning records were reviewed through the website of the relevant Planning Authority and, where necessary, the website of An Bord Pleanala. Consideration was given to the history of the site from a land use perspective. Current uses or planning applications granted, which are similar to the activities of the RBSF were deemed most appropriate.

4.6.4 Population & Sensitive Receptors

The population levels within 100m, 250m, and 500m of the potential site boundaries was estimated based on information from an address database (GeoDirectory) and data from Census 2016 (www.cso.ie). The results were cross-checked with property locations identifiable from aerial photography or maps provided by Google and Ordnance Survey Ireland. Average occupancy rates were adopted for the methodology, which may not reflect actual local occupancy especially when assessing smaller areas of interest. In addition, there may have been local changes in population since publication of the reference data. However, the approach is consistent across the five potential sites and is considered appropriate for this assessment.

During consultation, submissions were received in relation to how sensitive receptors were being considered in the selection process. As described in section 4.4, sensitive receptors were considered in relation to the relevant environmental criteria. In addition to these assessments, a broader review was carried out in the assessment for the Population & Sensitive Receptors criteria. Hospitals were identified from information available from the Health Service Executive (www.hse.ie) and nursing homes were identified from information available from the Health Information and Quality Authority (www.hiqa.ie). Primary, post primary and special education schools were identified from Department of Education and Skills (www.education.ie) and childcare facilities were identified from information available from Túsla – Child and Family Agency (maps.pobal.ie).

The number and proximity of residential properties and other sensitive receptors were compared to determine which sites have the least potential impacts on population and sensitive receptors.

4.6.5 Adjacent Land Use

The assessment of adjacent land use was carried out by reference to zoning maps contained in the relevant City/County Development Plan and online searches to determine adjoining land uses. Land uses in proximity to the candidate site were assessed on the basis of compatibility with the activities expected within the RBSF. Industrial uses would be considered most appropriate whereas residential would be considered least appropriate.

4.7 Social and Community Criteria

4.7.1 Material Assets

This section has been assessed in terms of the likely effect, if any, of the proposed RBSF on the material assets on the surrounding environment and access roads for each potential site. EPA guidelines define “resources that are valued and that are intrinsic to specific places are called ‘material assets’”. In the assessment the sustainable use of physical resources, which may be of either human or natural origin, both onsite and within the surrounding environment were investigated.

The following categories of material assets have been selected for the purposes of this Report:

- Non-renewable resources (e.g. minerals, soils, oil, gas, etc.);
- Cities, towns, villages and settlements;
- Transportation infrastructure (roads, railways, airports etc);
- Major utilities (water supplies, sewage, power systems, telecommunication systems etc.);
- Commercial and Industrial Development;
- Property;

- Tourism & Recreational Infrastructure; and
- Archaeology, Cultural & Architectural Heritage.

The assessment included a desktop review of the five sites using ordnance survey mapping, aerial photography, utility records, address databases and public registers available from the Health Service Executive and Department of Education and Skills in each of the areas. The assessment was based on a qualitative ranking approach. A site where there is the least potential for impact on material assets, as a result of the proposed development, was considered more favourable.

4.7.2 Neighbourhood Character

For each site under consideration, the likely impact on the area from a community perspective was considered and compared. Often defined as the 'look and feel of an area', in particular a residential area, neighbourhood character not only includes the physical and architectural characteristics, but also the community activities that occur there.

5.0 Assessment of Bracetown/Gunnocks Site

5.1 Site Description

The site comprises 12.5ha of existing agricultural grassland situated to the northeast of Dunboyne. The grassland is actively grazed and contains a series of mature treelines. The site slopes very gradually from northwest to southeast. Set to the east of the M3 motorway, the commercial and industrial developments of Bracetown Business Park and the Hub Logistics Park are located on the northern boundary. The site is accessed from the R147 regional road. A small watercourse, a tributary of the River Pinkeen, bounds the eastern side of the site.

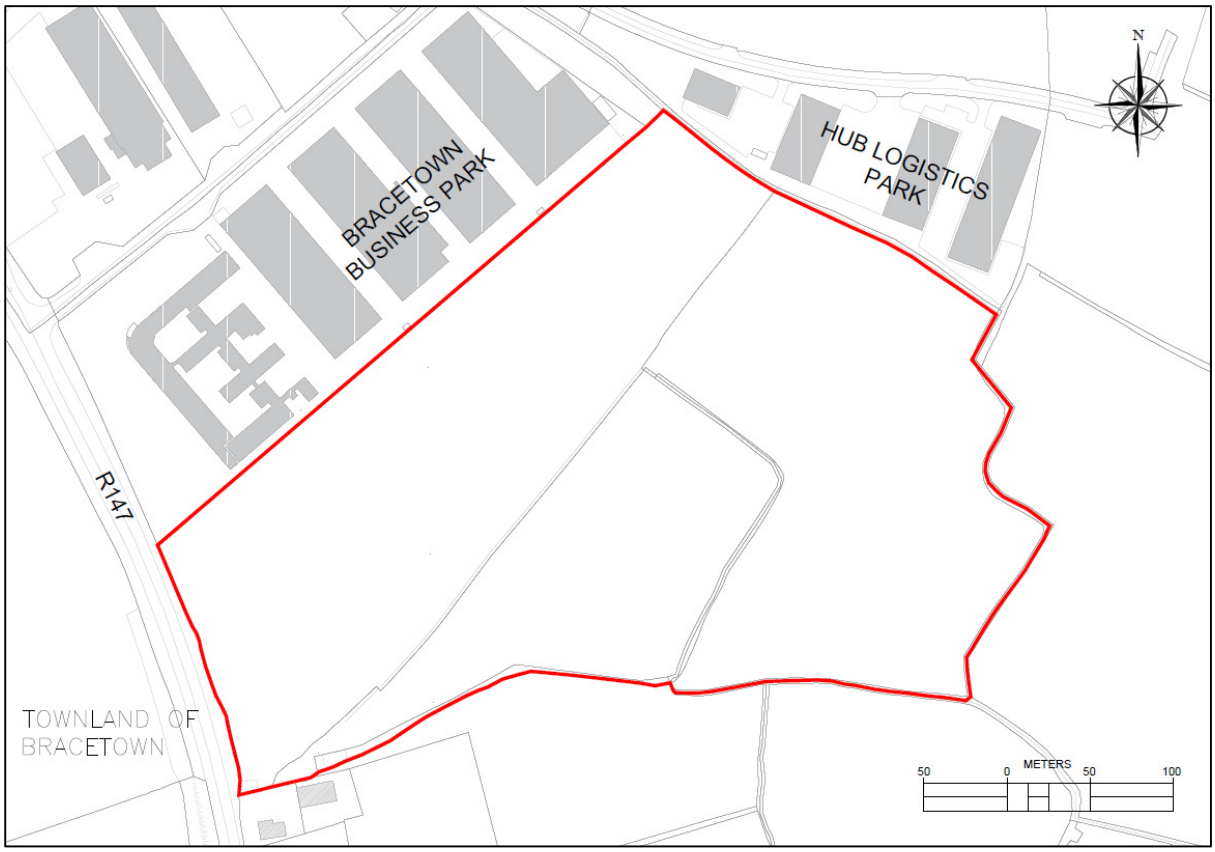

Figure 9 Site Plan at Bracetown/Gunnocks

5.2 Environmental

5.2.1 Air Quality

When the methodology provided in the TII guidelines is applied to this candidate site it is found that the change in traffic, in terms of impact on air quality and traffic-derived pollutants, would be negligible. The expected impact on air quality is insignificant.

In the assessment of the impact of dust during construction, the number of receptors within 50m of the candidate site boundaries was considered. There is one residential property adjacent to the potential site and another less than 100m from the site. These residential areas and commercial properties in the business park are receptors in terms of short-term construction dust impacts. It is considered that this site option will have a minor negative air quality impact without any mitigation measures being put in place. Once consideration is given to standard good practice measures to control dust emissions during the construction phase it is considered that this site option can be developed whilst having no significant air quality impacts.

5.2.2 Odour

The outcome of the 3-step odour assessment, described in section 4.4.2, for an unmitigated scenario at the Bracetown/Gunnocks site is outlined below.

Step 1. Evaluation of the potential for odour release. The potential for odour release was found to be the same for all sites. As described in section 4.4.2, the odour potential of the RBSF was conservatively classified as Large. This classification was considered appropriate for site selection, but when an odour mitigation system has been installed, the impact of Large odour classification will be significantly reduced and no odour nuisance will occur at the site boundary or beyond.

Step 2. Determination of the pathway effectiveness. In assessing the pathway effectiveness, the emission point characteristics remain the same for each site. An 'Ineffective Pathway' classification, which limits the transfer of odours from the source to the receptor, was determined. This was based on the likely odour control system to be provided at the proposed RBSF.

The assessment considered the number of receptors within 250m and 500m of the site boundary to provide an indication of potential public exposure. A summary of the investigation of receptors is summarised in Table 5.

Table 5 Odour Receptors considered in assessment of Bracetown/Gunnocks site

Receptors within 250m	• 10-15 Industrial/Commercial Units to the north of the site boundary • 3 residential properties to the north of the site boundary • 2 residential properties to the south of the site boundary
Additional Receptors within 500m	• Approximately 15 residential units to the north-west of the site boundary

Analysis of the meteorological data was undertaken to determine the long-term frequency of wind direction at the candidate site. There is a greater potential for odour exposure when there is an elevated proportion of downwind hours as this provides a more effective pathway from the source to the receptor. The predominant wind direction is from the southwest. There are sensitive receptors near to Bracetown/Gunnocks that are downwind of the proposed RBSF for approximately 35% of the hours in the assessed 30-year meteorological dataset.

Step 3. Definition of Receptor Sensitivity. The assessment has considered that all residential receptors have a high sensitivity to odour impacts while industrial/warehousing uses have a medium sensitivity to odour impacts. The risk assessment is conducted on the basis of the highest sensitivity receptors.

The risk of odour effects was determined by combining the source odour potential, the pathway effectiveness and receptor sensitivity using the IAQM methodology. The results from the qualitative risk-based assessment for candidate site is 'Moderate Adverse Effect'. This result is prior to the application of odour control measures at the proposed facility. When an odour mitigation system has been installed the result of 'Moderate Adverse Effect' will be significantly reduced and no appreciable odour will occur at the site boundary or beyond.

5.2.3 Noise

The Potential Impact Rating for the candidate site, which is based number of noise sensitive areas within four distance bands from the site, was calculated to be 13. The lowest PIR rating was 9 (Gunnocks) and the highest rating was 35 (Greenogue). This rating of 13 indicates a lower potential impact in comparison to the other sites. The assessment identified a total of 5 sensitive receptors within the 300m assessment range. No other sensitive receptors (i.e. schools, retirement homes, hospitals) were noted within this range.

The candidate site is located near a national road. A high-level review of the receiving environment from the Meath Noise Action Plan indicated the candidate site lies within the 50 to 65 and 45 to 55 decibel level ranges for the day-evening and night time noise indicators respectively. The receiving environment is not located within a *"quiet area"* or area of low background noise.

Depending on the site layout there is potential minor negative impacts on the receptors located north of the site (existing commercial and industrial buildings) as a result of the proposed RBSF at this site location.

5.2.4 Landscape & Visual

The candidate site is located at the edge of 'The Ward Lowlands' and adjoins the 'South East Lowlands' according to a Landscape Character Assessment (LCA) included in the Meath County Development Plan 2013-2019. The Ward Lowlands landscape area is described as of low value and high sensitivity and the landscape importance is described as regional. Gunnocks House, a protected structure, lies approximately 500m south of the site, however no other important landmarks are identified in the landscape area in the vicinity of the proposed site. The entirety of the landscape character area is located between the 50 and 100m contours, and except for built-up areas, the landscape is a mix of medium to large pasture and arable fields as well as areas of commercial development.

5.2.5 Geology & Hydrogeology

The candidate site is underlain by tills derived chiefly from limestone and depth to bedrock is unknown. Low permeability subsoil underlies the site. Geological Heritage sites were not identified at the site. A glaciofluvial terrace containing gravels lies adjacent to the site and contains a gravel pit which has not been commercially developed and a mega scale glacial lineation runs through the site. The proposed site has no previous historical use that might result in the presence of contaminated ground.

The site is underlain by a Locally Important Aquifer with bedrock which is moderately productive only in local zones. Vulnerability is identified as low to moderate. The businesses in the adjoining industrial park are dependent on groundwater for their water supply needs.

5.2.6 Hydrology

Information regarding flood risk to the candidate site was obtained from Preliminary Flood Risk Assessment Maps, Strategic Flood Risk Assessments (Meath County Development Plan) and from OPW records of flooding near the site. No CFRAM or FEMFRAM flood maps were available for the candidate site during assessment.

A review of the PFRA map at the candidate site indicated there is no foreseeable flood risk. The National Flood Hazard Mapping does not show any historic floods events occurring at the candidate site. However, there has been instances of flooding at the River Tolka near the site. In 2002, a storm flood event in excess of 1% AEP (or "1 in 100 year" event) resulted in flooding of the River Tolka at Loughsallagh Bridge and Clonee bridge, approximately 1.5km southeast of the candidate site. A flood relief scheme has now been constructed in this area as part of the River Tolka Flood Study commissioned by Dublin City Council in association with Fingal County Council, Meath County Council and the OPW. With the flood relief scheme in place, it is not expected that the candidate site will be vulnerable to flooding from this area.

The Flood Studies Update (FSU) portal identifies the candidate site is contained within the River Tolka catchment which naturally discharges to a point approximately 2.4km to the southeast. The catchment size of the River Tolka where the runoff from the site enters the river is approximately 68km^2, the site itself is approximately 0.1271km^2 and does not significantly contribute to the flow rate of the River Tolka. Information from the Geology Survey Ireland indicates that the topography of the candidate site is sloping from a north-western region towards a south-eastern region, which supports the information of the FSU that the runoff from the site drains to the River Tolka.

A tributary of the River Pinkeen (the Pace Stream) flows in a south easterly direction at the north-eastern boundary of the candidate site. This is the most likely outfall for surface runoff from the site. The Pace Stream flows in an easterly direction before joining downstream of all previously recorded major flood events. The Fingal County Council Strategic Flood Risk Assessment shows no signs of historical flooding downstream of the confluence of the River Pinkeen and River Tolka.

As noted above the subsoil at the potential site is till derived chiefly from limestone with low permeability. The maximum recharge capacity of the soil is approximately 200mm/year and an effective rainfall of 432 mm/year. This indicates that the site could contribute a high proportion of surface runoff relative to total precipitation. An initial estimation, using the IoH Report 124 method, shows the expected greenfield discharge rate from the site is approximately 32l/s. Considering the runoff is to be attenuated to existing greenfield run-off rates using suitable sustainable drainage systems, it is not envisaged there will be a sudden increase in flow rates in the tributary caused by the increase in impermeable area.

5.2.7 Ecology

The candidate site comprises three relatively large, open fields containing improved agricultural grassland (GA1) with active grazing. Three mature treelines (WL2), containing Ash, Hawthorn and Elder, separate the fields in addition to hedgerows (WL1) containing mainly of Hawthorn and Elder. The total length of mature treelines, internally on the site, is approximately 400m. The site lies approximately 250m away from the main channel of the Tolka River (FW2) and slopes very gently in a south-east direction towards this river.

The assessment of the habitats present confirms that the site is of local ecological value only. All the habitats present are common and widespread and none is listed for protection in the EU Habitats Directive. The proximity of the main channel of the Tolka River to the site increases the site's importance as the river contains salmonids. This river also discharges to Dublin Bay which contains four Natura 2000s sites designated under the EU Habitats Directive.

5.2.8 Archaeology, Cultural & Architectural Heritage

A review of the *Sites and Monuments Record* established that there are no undesignated monuments in the database at the candidate site or within 200m of the site.

An analysis of the 6-inch and 25-inch Ordnance Survey maps at the candidate site or within 200m of the site did not indicate any previously unrecorded archaeological sites or monuments. Examination of the Ordnance Survey imagery along with imagery of the area did not indicate any additional unrecorded archaeological sites or monuments at the candidate site or within 200m of the site.

A search for reports of archaeological test excavations and licensed monitoring found no such investigations have been carried out at the candidate site or within 200m of the site.

An examination of the Meath County Development Plan 2013 - 2019 established that there are no buildings listed as protected structures at the candidate site or within 200m of the site. A review of the National Inventory of Architectural Heritage (NIAH) found no listed buildings within the boundary or 200m of the candidate site. Furthermore, there are no known heritage sites situated within the boundary or 200m of the candidate site.

5.3 Economic & Engineering

5.3.1 Traffic

The R135 Regional Road is located to the west of the proposed site and runs in a north/south direction. The R135 has a carriageway width of 12m and 80kph speed limit within the study area The Annual Average Daily Traffic (AADT) was estimated as 7,558 based on traffic counts.

The M3 motorway is located to the west of the proposed site and runs in a north/south direction. The M3 has a carriageway width of approximately 25m and a 120kph speed limit within the study area. The AADT was recorded as 32,995 vehicles according to TII 2016 traffic counter figures.

The traffic count locations were situated at the roundabout on the R147 to the north of the site. The counts showed that the morning network peak hour at this location occurred between 08:00 and 09:00 and the evening network peak hour occurred between 16:00 and 17:00.

In terms of access arrangement, the visibility distances of 215m to the right and 240m to the left at the likely access point to the site are adequate when compared to the minimum desirable distance of 160m.

The links on the road network adjoining the potential site are the M3 and the R147 immediately adjacent the proposed site. The assessment found that the M3 is currently operating at approximately 64% of its theoretical capacity and the R120 is operating at 36% of its capacity. The provision of the proposed RBSF will result in marginal increases in Ratio of Flow to Capacity on the both the M3 and R147.

A traffic capacity assessment of the key junction, the roundabout on the R147 to the north of the site, was undertaken utilising the surveyed traffic flows and traffic modelling software. The roundabout junction currently has capacity for additional traffic from the proposed RBSF including both the morning and evening peak hours considered.

An overall comparative assessment of this site and the other potential sites is provided in section 10.3.1.

5.3.2 Road Safety

A Road Safety Impact Assessment (RSIA) was undertaken by the assessment team. It was found that the positive safety aspects of the candidate site are the low existing traffic volumes on R147 at the site entrance/exit. This will minimise potential conflicts with vehicles past the site.

A negative aspect of the candidate site is the requirement for HGVs exiting the site to turn right onto R147. High vehicle speed were also observed on R147 during the assessment.

An overall comparative assessment of this site and the other potential sites is provided in section 10.3.2.

5.3.3 Service & Utility Connections

The candidate site is not developed and therefore services are not readily available.

There are no wastewater or surface water sewers near the site and therefore, connections to a private or public sewer in the area are less feasible. A potential solution for wastewater flows generated by staff during operation of the RBSF would be onsite treatment with the treated effluent discharging, subject to local authority approval, to either a nearby watercourse or to groundwater. An outfall point for surface water run-off to the Pace Stream would be required for the proposed RBSF. This would be limited to flows to replicate current greenfield run-off rates as per GDSDS policy guidelines.

There is no public watermain running near the site. The existing public watermain (75mm diameter) which services the adjoining Bracetown Business Park does not have the capacity to supply potable water to the site. A ground water abstraction is a potential option for providing both fire water and potable water to the site. To reduce ground water abstraction volumes, rainwater harvesting could be implemented to recycle water where appropriate.

Electricity supply and telecommunications are available adjacent to the candidate site.

5.3.4 Geotechnical

The depth to bedrock for the candidate site is unknown. The site is underlain by tills derived chiefly from limestone. It is estimated that approximately 1 metre of fill across the building and site development areas may be required at the candidate site in order to provide a level base for construction. Evidence from GSI records do not indicate a requirement for excavation of soft ground or rock excavation at the candidate site. Nor do the records show a presence of karst.

5.3.5 Distance from Biosolids Sources

Haulage vehicles travelling to the candidate site from the biosolids sources will follow the M50 motorway. Vehicles from Ringsend WwTP will join the M50 at Junction 1 (south entrance to Dublin Port Tunnel), while vehicles from the proposed GDD WwTP will join at Junction 3 near Clonshaugh. Vehicles will continue on the M50 to Junction 6 and then travel on the N3/M3 to Junction 5 of the M3, a short distance north of Dunboyne. Here, vehicles will join the R147 and travel 1.2km to the candidate site. The overall transport distance from the source centre point, as defined in section 4.5.5, to the candidate site is 29.5km.

5.3.6 Capital & Operating Costs

An analysis of the percentage cost difference for the candidate site indicates a range of between 2% and 25% above the Base Cost. The additional cost is attributed to the likely requirement for relatively large volumes of fill material and the potential requirement for a noise barrier. The lack of availability of public water and sewers near the candidate site was also accounted for in the assessment.

Transport costs in bringing biosolids to this candidate site during the operation of the facility are estimated to be 10% less than that of the site with the highest cost, namely Greenogue.

5.4 Planning

5.4.1 Land Use Zoning

The candidate site is considered in the context of the current *Meath County Council Development Plan 2013 – 2019*, which is the statutory land-use plan governing the candidate site. The candidate site does not form part of a Local Area Plan. The site is currently zoned under the plan as 'E2' General Enterprise &

Employment/'E3' Warehousing & Distribution with the objectives: "E2 - To provide for the creation of enterprise and facilitate opportunities for employment through industrial, manufacturing, distribution, warehousing and other general employment/enterprise uses in a good quality physical environment" and "E3 - To facilitate logistics, warehousing, distribution and supply chain management inclusive of related industry facilities which require good access to the major road network."

Under E2 and E3 zoning categories noted in the development plan a Waste Recycling/Transfer/Sorting Centre is a use which is "open for consideration". The Development Plan states that E2 zoned land constitutes "an important land bank for employment use which must be protected. The development of E2 lands seek to provide for the creation and production of enterprise and facilitate opportunities for industrial, manufacturing, distribution, warehousing and other general employment/enterprise uses in a good quality physical environment."

5.4.2 Planning Policies & Objectives

In addition to the land use zoning descriptions, the *Meath County Council Development Plan 2013 – 2019* further states that development on lands zoned for the E2 and E3 category requires:

- The preparation of a non-statutory Masterplan to ensure the provision of the necessary physical infrastructure, the appropriate density and design of layout and the interface between proposed uses and existing development;
- That all processes being operated near the site, similarly zoned E2, are classified as light industrial in nature, as defined in the Planning and Development Regulations 2001-2017, as amended;
- That the site is located adjacent to a public transport corridor and is served by an adequate road network; and
- That any application is accommodated by a viable Mobility Management Plan.

The candidate site is near one of five key strategic employment sites referred to in the Development Plan and there are many references in Development Plan to the employment opportunities in the area north of Dunboyne near the M3 Parkway train station.

The *Meath County Council Development Plan 2013 – 2019* for the Dunboyne/Dunboyne North/Clonee area indicates plans for a 'Major Distributor Road' to the east of the candidate site. This road will link the existing Hub logistics park to the R156 regional road to the south.

Public Safety Zones and Noise Zones for Dublin Airport, and the associated development management measures, are referenced in the *Meath County Council Development Plan 2013 – 2019*. It states that there is a need to minimise the adverse impact of noise without placing unreasonable restrictions on development and that, in relation to safety zones, the Council will follow the advice of the Irish Aviation Authority regarding the effects of proposed development on the safety of aircraft and the safe and efficient navigation thereof.

A review of the safeguarding zones for Dublin Airport published in the Fingal Development Plan show that the candidate site is located approximately 50m from the Dublin Airport Outer Public Safety Zone and 400m from the Outer Noise Zone.

5.4.3 Planning History & Current Usage

A review of the Meath County Council planning database shows no planning history at the candidate site. The land is currently utilised for agricultural purposes and a review of historic maps, both 6-inch and 25-inch, would suggest the site has not been subject to a previous development.

5.4.4 Population & Sensitive Receptors

The estimated population within 100m, 250m and 500m of the boundary of the candidate site is summarised in Table 6 below.

Table 6 Estimated Population near Bracetown/Gunnocks site

Distance from Site Boundary	***Estimated Population***
100m	5
250m	14
500m	59

There are no hospitals near the candidate site. There is a nursing home 1.5km to the southeast of the candidate site on the opposite side of the M3 motorway, just off the R147.

There are four primary schools and one post-primary school to the southwest of the candidate site on the opposite side of the M3 motorway in the town of Dunboyne. These schools are located between 1km and 1.6km from the candidate site.

5.4.5 Adjacent Land Use

The site is primarily bounded by farmlands to the south and east, the R147 regional road to the west and Bracetown Business Park to the north. The Bracetown Business has been subject to several planning applications over a period of 20 years which includes:

- MCC Reg. Ref. 0184: Permission sought by Group Properties Holdings for an extension to existing offices & provision of crèche plus associated site works. Permission granted by Meath County Council in February 2002.
- MCC Reg. Ref. DA70233: Permission sought by Group Properties Holdings for the addition of a three storey extension (483.6sqm) to office Block B, demolition of existing switchroom/security kiosk (27.5 sqm) and minor alterations to elevations, roof plan, section and site layout. Permission granted by Meath County Council in August 2007.
- MCC Reg. Ref DA50233: Permission was sought by Hickwell Ltd. for the construction of a logistics, warehousing and light industrial development comprising of 6no. units. Permission granted by Meath County Council in December 2010.
- The house located in the south-east corner of the site was granted permission by Meath County Council in July 1999 to raise the roof height to accommodate an attic version (MCC Reg. Ref. 99687).

5.5 Social and Community

5.5.1 Material Assets

In the context of material assets, the Bracetown/Gunnocks site is utilised for agriculture and is located approximately 1.5km northeast of the residential area of Dunboyne, which has a population of approximately 10,000 people. The site is accessed from the R147 regional road via Junction 5 of the M3 motorway, both of which are designed to accommodate HGV traffic. The Hub Logistics Park and Bracetown Business Park, which consists of industrial and commercial businesses are located to the north of the site. The candidate site has no previous use that may result in the presence of contaminated ground.

There are two foreign direct investment projects to be constructed within 2.5km of the candidate site. Shire Pharmaceuticals are developing a processing facility to the north of the candidate site and Facebook are developing a data centre to the south.

There are four primary schools and one post primary school located within the town of Dunboyne and within 2km of the candidate site. These include St. Peters NS, Dunboyne Jnr NS, Dunboyne Snr NS, Gaelscoil Thulach Na Nóg and St. Peter's College.

There are no hospitals, nursing homes or primary care units located within 1km of the candidate site. There are small number of medical practitioners situated in town of Dunboyne.

The Archaeology, Cultural & Architectural Heritage assessment (section 5.2.8) established that there are no recorded monuments within the site candidate or within 200m of the site boundary. There are no SPAs or SACs located near the candidate site. However, the River Tolka and its catchment area discharges to the South Dublin Bay SAC (000210) and South Dublin Bay and River Tolka Estuary SPA (004024), approximately 16km downstream. Rye Water Valley/Carton SAC (001398) is the nearest Natura 2000 site and is located 15km from the candidate site.

The nearest public sewers are located approximately 3km to the East in Damastown. As a result, effluent and surface run off from the RBSF development would need be treated and discharged to the adjacent watercourse. Based on the low number of staff, it may also be feasible to treat effluent and discharge it to

groundwater. The nearby Bracetown Business Park operates its own wastewater treatment system and has a licence to discharge to the River Tolka via a pumped rising main.

It will be necessary to discharge surface water run-off to the adjacent watercourse. Potable water is not available from a public source, thus requiring a supply from a groundwater well. The business park utilises groundwater from local wells to service its requirements.

5.5.2 Neighbourhood Character

The candidate site is located next to an emerging employment and enterprise area to the northeast of Dunboyne town and adjacent to the M3 motorway. The site and surrounding area is predominantly an agricultural setting except for the Hub Logistics Park and Bracetown Business Park to the north. The business parks contain some office based employment. However, the majority are industrial-based premises. The business parks contain some office based employment. However, the majority are industrial based premises. Further northwest of the business parks, at a distance of 300m from the site, there are two housing estates comprising a total of approximately 15 houses. There are other one-off houses in the area, with two houses located beside the site at its southwest corner.

6.0 Assessment of Gunnocks Site

6.1 Site Description

The site comprises 14.5ha of existing grassland, which appears to be utilised for silage, situated to the northeast of the town of Dunboyne. The site consists of 5 fields and contains a series of mature treelines. The site slopes very gradually from northwest to southeast. Set to the east of the of the M3 motorway, the commercial and industrial developments of Bracetown Business Park and the Hub Logistics Park are located 300m to the north. The site is accessed from the R147 regional road. A small watercourse, a tributary of the River Pinkeen, bounds the eastern side of the site.

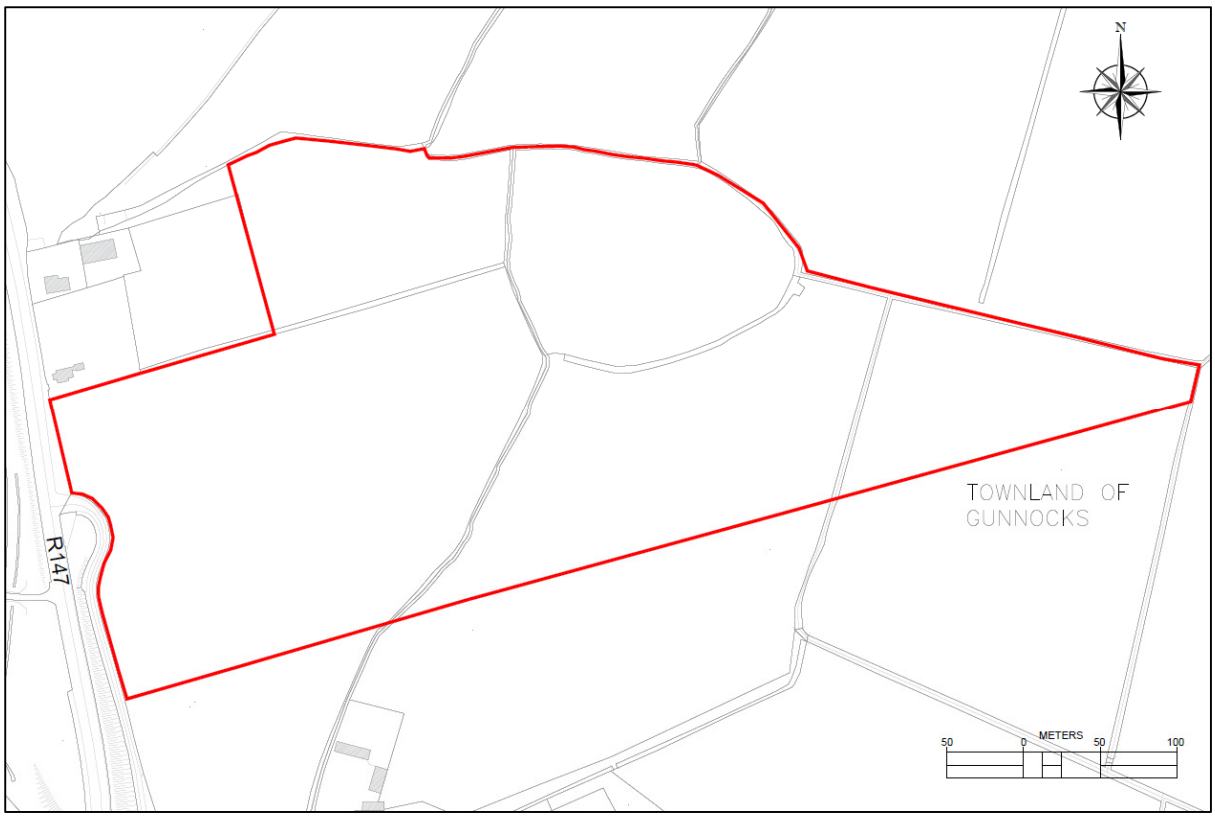

Figure 10 Site Plan at Gunnocks

6.2 Environmental

6.2.1 Air Quality

When the methodology provided in the TII guidelines is applied to this candidate site it is found that the change in traffic, in terms of impact on air quality and traffic-derived pollutants, would be negligible. The expected impact on air quality is insignificant.

In the assessment of the impact of dust during construction, the number of receptors within 50 m of the candidate site boundaries was considered. There is one residential property less than 1 metre from the potential site boundary and another less than 10m from the site. These residential properties are receptors in terms of short-term construction dust impacts. It is considered that this site option will have a minor negative air quality impact prior to any mitigation measures being put in place.

Once consideration is given to standard good practice measures to control dust emissions during the construction phase it is considered that this site option can be developed whilst having no significant air quality impacts.

6.2.2 Odour

The outcome of the 3-step odour assessment, described in section 4.4.2, for an unmitigated scenario at the Gunnocks site is outlined below.

Step 1. Evaluation of the potential for odour release. The potential for odour release was found to be the same for all sites. As described in section 4.4.2, the odour potential of the RBSF was conservatively classified as Large. This classification was considered appropriate for site selection, but when an odour mitigation system has been installed, the impact of Large odour classification will be significantly reduced and no odour nuisance will occur at the site boundary or beyond.

Step 2. Determination of the pathway effectiveness. In assessing the pathway effectiveness, the emission point characteristics remain the same for each site. An 'Ineffective Pathway' classification, which limits the transfer of odours from the source to the receptor, was determined. This was based on the likely odour control system to be provided at the proposed RBSF.

The assessment considered the number of receptors within 250m and 500m of the site boundary to provide an indication of potential public exposure. A summary of the investigation of receptors is summarised in Table 7.

Table 7 Odour Receptors considered in assessment of Gunnocks site

Receptors within 250m	• 2 residential units to the north-west of the site boundary • 1 residential property to the south-west of the site boundary
Additional Receptors within 500m	• 10-15 Industrial/Commercial Units to the north of the site boundary

Analysis of the meteorological data was undertaken to determine the long-term frequency of wind direction at the candidate site. There is a greater potential for odour exposure when there is an elevated proportion of downwind hours as this provides a more effective pathway from the source to the receptor. The predominant wind direction is from the southwest. There are sensitive receptors near to the Gunnocks site that are downwind of the proposed RBSF for approximately 25% of the hours in the assessed 30-year meteorological dataset.

Step 3. Definition of Receptor Sensitivity. The assessment has considered that all residential receptors have a high sensitivity to odour impacts while industrial/warehousing uses have a medium sensitivity to odour impacts. The risk assessment is conducted on the basis of the highest sensitivity receptors.

The risk of odour effects was determined by combining the source odour potential, the pathway effectiveness and receptor sensitivity using the IAQM methodology. The results from the qualitative risk-based assessment for candidate site is 'Moderate Adverse Effect'. This result is prior to the application of odour control measures at the proposed facility. When an odour mitigation system has been installed the result of 'Moderate Adverse Effect' will be significantly reduced and no appreciable odour will occur at the site boundary or beyond.

6.2.3 Noise

The Potential Impact Rating for the candidate site, which is based number of noise sensitive areas within four distance bands from the site, was calculated to be 9. The was the lowest rating of the five potential sites. The highest rating was 35 (Greenogue). This rating indicates a lower potential impact in comparison to the other sites. The assessment identified a total of 3 sensitive receptors within the 300m assessment range. No other sensitive receptors (i.e. schools, retirement homes, hospitals) were noted within this range.

The candidate site is located near a national road. A high-level review of the receiving environment from the Meath Noise Action Plan indicated the candidate site lies within the 50 to 65 and 50 to 55 decibel level ranges for the day-evening and night time noise indicators respectively. The receiving environment is not located within a *"quiet area"* or area of low background noise.

Depending on the site layout there is potential for minor negative impacts to occur as a result of the proposed RBSF in this location.

6.2.4 Landscape & Visual

The candidate site is located at the edge of 'South East Lowlands' and adjoins the 'The Ward Lowlands' according to a Landscape Character Assessment (LCA) included in the Meath County Development Plan 2013-2019. The Ward Lowlands landscape area is described as of low value and high sensitivity and the landscape importance is described as regional. Gunnocks House, a protected structure, lies approximately 500m south of the site. However, no other important landmarks are identified in the landscape area in the vicinity of the proposed site. The entirety of the landscape character area is located between the 50 and 100m contours, and except for built-up areas, the landscape is a mix of medium to large pasture and arable fields as well as areas of commercial development.

6.2.5 Geology & Hydrogeology

The candidate site is underlain by tills derived chiefly from limestone and depth to bedrock is unknown. Geological Heritage sites were not identified at the site. A glaciofluvial terrace containing gravels lies adjacent to the site and contains a gravel pit which has not been commercially developed and a mega scale glacial lineation runs through the site. The proposed site has no previous historical use that might result in the presence of contaminated ground.

A Locally Important Aquifer underlies the candidate site with bedrock which is moderately productive only in local zones. Vulnerability is identified as low to moderate. The businesses in the adjoining industrial park are dependent on groundwater for their water supply needs.

6.2.6 Hydrology

Information regarding flood risk to the candidate site was obtained from Preliminary Flood Risk Assessment (PRFA) Maps, Meath County Council Strategic Development Plan and from OPW records of flooding near the site. No CFRAM or FEMFRAM flood maps were available for the candidate site during assessment.

A review of the PFRA map at the candidate site indicated there is no foreseeable flood risk. The National Flood Hazard Mapping does not show any historic flood events occurring at the candidate site. However, there has been instances of flooding at the River Tolka near the site. In 2002, a storm flood event in excess of 1% AEP (or "1 in 100 year" event) resulted in flooding of the River Tolka at Loughsallagh Bridge and Clonee bridge, approximately 1.2km southeast of the candidate site. A flood relief scheme has now been constructed in this area as part of the River Tolka Flood Study commissioned by Dublin City Council in association with Fingal County Council, Meath County Council and the OPW. With the flood relief scheme in place, it is not expected that the candidate site will be vulnerable to flooding from this area.

The Flood Studies Update (FSU) portal identifies the candidate site is within the River Tolka catchment which naturally discharges to a point approximately 2.4km to the southeast. The catchment size of the River Tolka is approximately 68km^2 and the site itself is approximately 0.145km^2. The site is not expected to significantly contribute to the flow rate of the River Tolka. Data from Geology Survey of Ireland indicates that the topography of the candidate site is sloping from a north-western region towards a south-eastern region, which supports the FSU information that the site drains to the River Tolka.

A tributary of the River Pinkeen (the Pace Stream) flows in a south easterly direction at the north-eastern boundary of the candidate site. This is the most likely outfall for surface runoff from the site. The Pace Stream flows in an easterly direction before re-joining the River Tolka at Damastown Industrial Estate, which is located downstream of all previously recorded major flood events. The Fingal County Council Strategic Flood Risk Assessment shows no signs of historical flooding downstream of the confluence of the River Pinkeen and River Tolka.

The subsoil at the candidate site is till derived chiefly from limestone with a low permeability. The maximum recharge capacity of the soil is approximately 200mm/year and an effective rainfall of 432 mm/year. This indicates that the site could contribute a high proportion of surface runoff relative to total precipitation. An initial estimation, using the IoH Report 124 method, shows the expected greenfield discharge rate from the site is approximately 36l/s. Considering the runoff is to be attenuated using suitable sustainable drainage systems, it is not envisaged there will be a sudden increase in flow rates in the tributary caused by the increase in impermeable area.

6.2.7 Ecology

The candidate site comprises five moderately sized, open fields and aerial imagery suggests a homogenous nature to the site. The portion of the site nearest the road access contains improved agricultural grassland which was being actively used for silage making at the time of the survey. Two mature treelines (WL2) were visible containing Ash and Sycamore in addition to hedgerows (WL1) comprising mainly Hawthorn and Elder. The total length of mature treelines, internally on the site, is approximately 820m. The site lies approximately 150m from the main channel of the Tolka River (FW2) and slopes very gently in a south-east direction towards this river.

The assessment of the habitats present confirms that the site is of local ecological value only. All the habitats present are common and widespread and none is listed for protection in the EU Habitats Directive. The proximity of the main channel of the Tolka River to the site increases the site's importance as the river contains salmonids. This river also discharges to Dublin Bay which contains four Natura 2000s sites designated under the EU Habitats Directive.

6.2.8 Archaeology, Cultural & Architectural Heritage

A review of the *Record of Monuments and Places* established that there are no undesignated monuments entered in the database at the candidate site, however there is one recorded monument, an 18th/19th century house (ME051-008), situated 200m to the south of the candidate site.

A review of the *Sites and Monuments Record* established that there are no undesignated monuments entered in the database at the candidate site or within 200m of the site.

An analysis of the 6-inch and 25-inch Ordnance Survey maps at the candidate site or within 200m of the site did not indicate any previously unrecorded archaeological sites or monuments. Examination of aerial imagery did not indicate any additional unrecorded archaeological sites or monuments at the candidate site or within 200m of the site.

A search for reports of archaeological test excavations and licensed monitoring found no such investigations have been carried out at the candidate site, however several archaeological investigations have been carried out within 200m of the candidate site. These test investigations (04E0489) were carried out as part of an assessment for the main section of M3 motorway from Clonee to Dunshaughlin. A geophysical survey suggested that the area had the potential to contain archaeological sites. 79 test-trenches carried out in the area confirmed that some of the anomalies recorded in the geophysical survey were archaeological sites.

An examination of the Meath County Development Plan 2013-19 established that there are no buildings listed as protected structures within the boundary however as noted above an 18th/19th century house is situated within 200m of the candidate site. A review of the National Inventory of Architectural Heritage (NIAH) found no listed buildings within the boundary or 200m of the candidate site. Furthermore, there are no known heritage sites situated within the boundary, however there is archaeology within 75m of the candidate site.

6.3 Economic & Engineering

6.3.1 Traffic

The R135 Regional Road is located to the west of the proposed site and runs in a north/south direction. The R135 has a carriageway width of 12m and 80kph speed limit within the study area. The Annual Average Daily Traffic (AADT) was estimated as 7,558 based on traffic counts.

The M3 motorway is located to the west of the proposed site and runs in a north/south direction. The M3 has a carriageway width of approximately 25m and a 120kph speed limit within the study area. The AADT was recorded as 32,995 vehicles according to TII 2016 traffic counter figures.

The traffic count locations were situated at the roundabout on the R147 to the north of the site. The counts showed that the morning network peak hour at this location occurred between 08:00 and 09:00 and the evening network peak hour occurred between 16:00 and 17:00.

In terms of access arrangement, the visibility distances of 240m to the right and 260m to the left at the likely access point to the site are adequate when compared to the minimum desirable distance of 160m.

The links on the road network adjoining the potential site are the M3 and the R147 immediately adjacent the proposed site. The assessment found that the M3 is currently operating at approximately 64% of its theoretical capacity and the R120 is operating at 36% of its capacity. The provision of the proposed RBSF will result in marginal increases in Ratio of Flow to Capacity on the both the M3 and R147.

A traffic capacity assessment of the key junction, the roundabout on the R147 to the north of the site, was undertaken utilising the surveyed traffic flows and traffic modelling software. The roundabout junction currently has capacity for additional traffic from the proposed RBSF including both the morning and evening peak hours considered.

An overall comparative assessment of this site and the other potential sites is provided in section 10.3.1.

6.3.2 Road Safety

A Road Safety Impact Assessment (RSIA) was undertaken by the assessment team. It was found that the positive safety aspect of the candidate site is the low existing traffic volumes on R147 at the site entrance/exit. This will minimise potential conflicts with vehicles past the site.

The negative aspect of the candidate site is the requirement for HGVs exiting the site to turn right onto R147 and the high vehicle speed observed on R147 during the assessment. In addition, interaction of proposed entrance with existing entrances may require a departure from standard for visibility and proximity to one another.

An overall comparative assessment of this site and the other potential sites is provided in section 10.3.2.

6.3.3 Service & Utility Connections

The candidate site is not developed and therefore services are not readily available.

There are no wastewater or surface water sewers near the site and therefore, connections to a private or public sewer in the area is less feasible. A potential solution for wastewater flows generated by staff during operation of the RBSF would be onsite treatment with the treated effluent discharging, subject to local authority approval, to either a nearby watercourse or to groundwater. An outfall point for surface water run-off to the Pace Stream would be required for the proposed RBSF. This would be limited to flows to replicate current greenfield run-off rates.

There is no public watermain running near the site. The existing public watermain (75mm diameter) which services the adjoining Bracetown Business Park does not have the capacity to supply potable water to the site. A ground water abstraction is a potential option for providing both fire water and potable water to the site. To reduce ground water abstraction volumes, rainwater harvesting could be implemented to recycle water where appropriate.

Electricity supply and telecommunications is available adjacent to the candidate site.

6.3.4 Geotechnical

The depth to bedrock for the candidate site is unknown. The site is underlain by tills derived chiefly from limestone. It is estimated that approximately 1.5m of fill across the building and site development areas may be required at the candidate site in order to provide a level base for construction. Evidence from GSI records do not indicate a requirement for excavation of soft ground or rock excavation at the candidate site. Nor do the records show a presence of karst.

6.3.5 Distance from Biosolids Sources

Haulage vehicles travelling to the candidate site from the biosolids sources will follow the M50 motorway. Vehicles from Ringsend WwTP will join the M50 at Junction 1 (Dublin Port Tunnel), while vehicles from the proposed GDD WwTP will join at Junction 3 near Clonshaugh. Vehicles will continue on the M50 to Junction 6 and then travel on the N3/M3 to Junction 5 of the M3, a short distance north of Dunboyne. Here, vehicles will join the R147 and travel 1.2km to the candidate site. The overall transport distance from the source centre point, as defined in section 4.5.5, to the candidate site is 29.7km.

6.3.6 Capital & Operating Costs

An analysis of the percentage cost difference for the candidate site indicates a range of between 2% and 25% above the Base Cost. The additional cost is attributed to the likely requirement for relatively large volumes of fill material and the potential requirement for a noise barrier. The lack of availability of public sewers near the candidate site was also accounted for in the assessment.

Transport costs in bringing biosolids to this candidate site during the operation of the facility are estimated to be 10% less than that of the site with the highest cost, namely Greenogue.

6.4 Planning

6.4.1 Land Use Zoning

The candidate site is considered in the context of the current *Meath County Council Development Plan 2013 – 2019*, which is the statutory land-use plan governing the candidate site. The candidate site does not form part of a Local Area Plan. The site is currently zoned under the plan as 'E2' General Enterprise & Employment/'E3' Warehousing & Distribution with the objectives: "E2 - To provide for the creation of enterprise and facilitate opportunities for employment through industrial, manufacturing, distribution, warehousing and other general employment/enterprise uses in a good quality physical environment" and "E3 - To facilitate logistics, warehousing, distribution and supply chain management inclusive of related industry facilities which require good access to the major road network."

Under E2 and E3 zoning categories noted in the development plan a Waste Recycling/Transfer/Sorting Centre is a use which is "open for consideration". The Development Plan states that E2 zoned land constitutes "an important land bank for employment use which must be protected. The development of E2 lands seek to provide for the creation and production of enterprise and facilitate opportunities for industrial, manufacturing, distribution, warehousing and other general employment/enterprise uses in a good quality physical environment."

6.4.2 Planning Policies & Objectives

In addition to the land use zoning descriptions, the *Meath County Council Development Plan 2013 – 2019* further states that development on lands zoned for the E2 and E3 category requires:

- The preparation of a non-statutory Masterplan to ensure the provision of the necessary physical infrastructure, the appropriate density and design of layout and the interface between proposed uses and existing development.
- That all processes being operated near the site, similarly zoned E2, are classified as light industrial in nature, as defined in the Planning and Development Regulations 2001-2017, as amended;
- That the site is located adjacent to a public transport corridor and is served by an adequate road network, and;
- That any application is accommodated by a viable Mobility Management Plan.

The candidate site is near one of five key strategic employment sites referred to in the Development Plan and there are many references in Development Plan to the employment opportunities in the area north of Dunboyne near the M3 Parkway train station.

The Development Plan for the Dunboyne North/Dunboyne/Clonee area indicates plans for a 'Major Distributor Road' to the east of the candidate site. This road will link the existing Hub logistics park to the R156 regional road to the south.

Public Safety Zones and Noise Zones for Dublin Airport, and the associated development management measures, are referenced in the *Meath County Council Development Plan 2013 – 2019*. It states that there is a need to minimise the adverse impact of noise without placing unreasonable restrictions on development and that, in relation to safety zones, the Council will follow the advice of the Irish Aviation Authority regarding the effects of proposed development on the safety of aircraft and the safe and efficient navigation thereof.

A review of the safeguarding zones for Dublin Airport published in the Fingal Development Plan show that the candidate site is located approximately 400m from the Dublin Airport Outer Public Safety Zone and 150m from the Outer Noise Zone.

6.4.3 Planning History & Current Usage

A review of the Meath County Council planning database shows no planning history at the candidate site. The land is currently utilised for agricultural purposes and a review of historic maps, both 6-inch and 25-inch, would suggest the site has not been subject to a previous development.

6.4.4 Population & Sensitive Receptors

The estimated population within 100m, 250m and 500m of the boundary of the candidate site is summarised in Table 8 below.

Table 8 Estimated Population near Gunnocks site

Distance from Site Boundary	*Estimated Population*
100m	5
250m	8
500m	11

There are no hospitals near the candidate site. There is a nursing home 1.2km to the southeast to the candidate site on the opposite side of the M3 motorway, just off the R147.

There are four primary schools and one post-primary school to the southwest of the candidate site on the opposite side of the M3 motorway in the town of Dunboyne. These schools are located between 800m and 1.5km from the candidate site.

6.4.5 Adjacent Land Use

The site is primarily bounded by farmlands to the south and east, the R147 regional road to the west and Bracetown Business Park is 300m to the north. The Bracetown Business has been subject to several planning applications over a period of 20 years which includes:

- MCC Reg. Ref. 0184: Permission sought by Group Properties Holdings for an extension to existing offices & provision of crèche plus associated site works. Permission granted by Meath County Council in February 2002.
- MCC Reg. Ref. DA70233: Permission sought by Group Properties Holdings for the addition of a three storey extension (483.6sqm) to office Block B, demolition of existing switchroom/security kiosk (27.5 sqm) and minor alterations to elevations, roof plan, section and site layout. Permission granted by Meath County Council in August 2007.
- MCC Reg. Ref DA50233: Permission was sought by Hickwell Ltd. for the construction of a logistics, warehousing and light industrial development comprising of 6no. units. Permission granted by Meath County Council in December 2010.
- The house located in the south-east corner of the site was granted permission by Meath County Council in July 1999 to raise the roof height to accommodate an attic version (MCC Reg. Ref. 99687).

6.5 Social and Community

6.5.1 Material Assets

The candidate site is utilised for agriculture and is located approximately 1.5km northeast of the residential area of Dunboyne, which has a population of approximately 10,000 people. The site is accessed from the R147 regional road via Junction 5 of the M3 motorway, both of which are designed to accommodate HGV traffic. The Hub Logistics Park and Bracetown Business Park, which consists of industrial and commercial businesses are located to the north of the site. The candidate site has had no previous use that may result in the presence of contaminated ground.

There are two foreign direct investment projects to be constructed within 2.5km of the candidate site. Shire Pharmaceuticals are developing a processing facility to the north of the candidate site and Facebook are developing a data centre to the south.

There are four primary schools and one post primary school located within the town of Dunboyne and within 2km of the candidate site. These include St. Peters NS, Dunboyne Jnr NS, Dunboyne Snr NS, Gaelscoil Thulach Na Nóg and St. Peter's College.

There are no hospitals, nursing homes or primary care units located within 1km of the candidate site. There are small number of medical practitioners situated in the town of Dunboyne.

The Archaeology, Cultural & Architectural Heritage assessment (section 6.2.8) established that there are no recorded monuments within the candidate site or within 200m of the site boundary. There are no SPAs or SACs located near the candidate site. However, the River Tolka and its catchment area discharges to the South Dublin Bay SAC (000210) and South Dublin Bay and River Tolka Estuary SPA (004024), approximately 16km downstream. Rye Water Valley/Carton SAC (001398) is the nearest Natura 2000 site and is located 15km from the candidate site.

The nearest public sewers are located approximately 3km to the East in Damastown. As a result, effluent and surface run off from the RBSF development would need be treated and discharged to the adjacent watercourse. Based on the low number of staff, it may also be feasible to treat effluent and discharge it to groundwater. The nearby Bracetown Business Park operates its own wastewater treatment system and has a licence to discharge to the River Tolka via a pumped rising main.

It will be necessary to discharge surface water run-off to the adjacent watercourse. Potable water is not available from a public source, thus requiring a supply from a groundwater well. The business park utilises groundwater from local wells to service its requirements. Electricity supply is available.

A 110Kv runs parallel and approximately 15m to the south of the candidate site boundary.

6.5.2 Neighbourhood Character

The candidate site is located within 300m of an emerging employment and enterprise area to the northeast of Dunboyne town and adjacent to the M3 motorway. The site and area is predominantly an agricultural setting except for the Hub Logistics Park and Bracetown Business Parks to the north. The business parks contain some office based employment. However, the majority are industrial based premises. Further northwest of the business parks, at a distance of 550m from the site, there are two housing estates comprising a total of approximately 15 houses. There are other one-off houses in the area, with two houses located beside the site at its northwest corner.

7.0 Assessment of Greenogue Site

7.1 Site Description

The site is approximately 12.5ha and is situated between the towns of Newcastle and Rathcoole. The site is accessed from the R120 regional road. The site comprises two fields containing crops and ungrazed grassland and both contain mature treelines. The site slopes from south to north. The commercial and industrial developments of Aerodrome and Greenogue Business Parks are located to the northeast of site, on the opposite side of the R120. There are two houses beside the candidate site and another house on the opposite side of the R120. Watercourses flow in a north-easterly direction, across the central portion of the site and along the southeastern boundary, and are within the catchment of the River Griffeen.

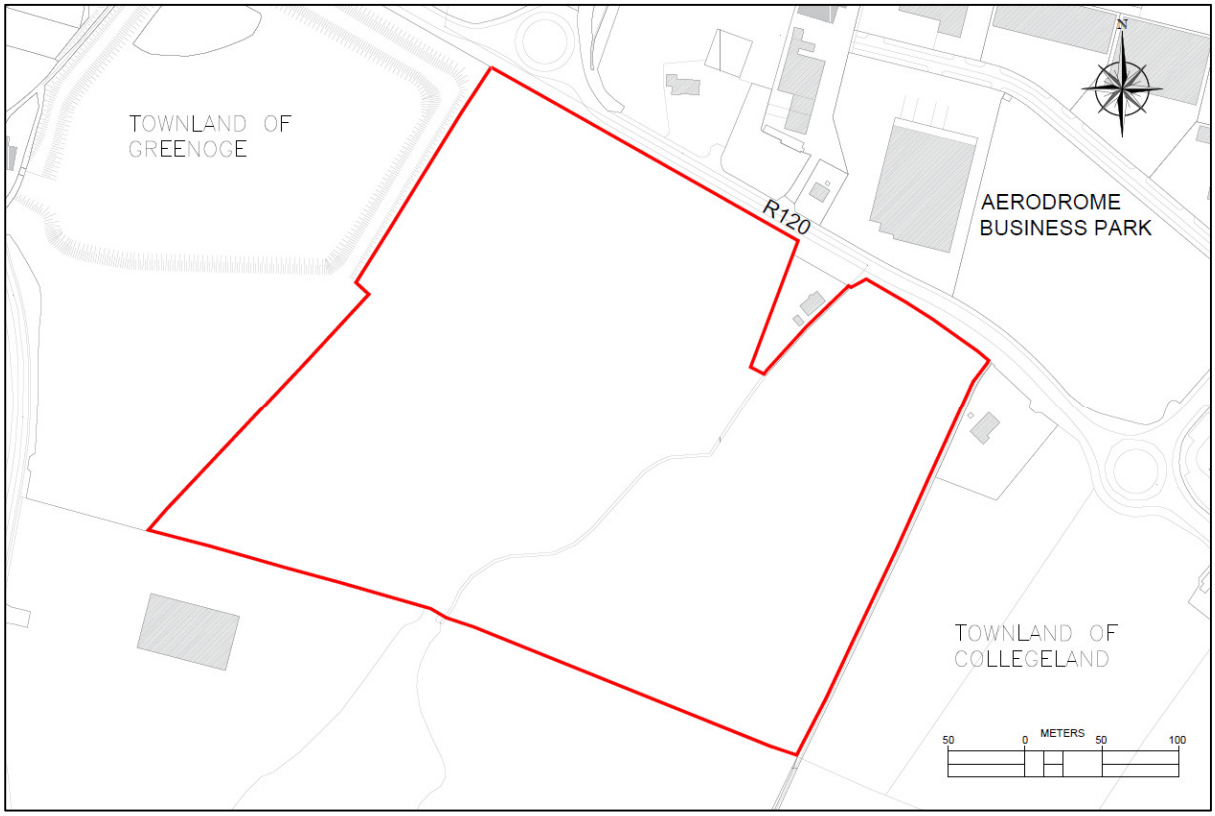

Figure 11 Site Plan at Greenogue

7.2 Environmental

7.2.1 Air Quality

When the methodology provided in the TII guidelines is applied to this candidate site it is found that the change in traffic, in terms of impact on air quality and traffic-derived pollutants, would be negligible. The expected impact on air quality is insignificant.

In the assessment of the impact of dust during construction, the number of receptors within 50m of the candidate site boundaries was considered. There are three residential properties within 30m of the site, two of which are directly adjacent to the site. These residential properties are receptors in terms of short-term construction dust impacts. There is also a regional road (R120) in the area of the site. It is considered that this site option will have a minor negative dust impact with no mitigation measures in place.

Once consideration is given to standard good practice measures to control dust emissions during the construction phase it is considered that this site option can be developed whilst having no significant air quality impacts.

7.2.2 Odour

The outcome of the 3-step odour assessment, described in section 4.4.2, for an unmitigated scenario at the Greenogue site is outlined below.

Step 1. Evaluation of the potential for odour release. The potential for odour release was found to be the same for all sites. As described in section 4.4.2, the odour potential of the RBSF was conservatively classified as Large. This classification was considered appropriate for site selection, but when an odour mitigation system has been installed, the impact of Large odour classification will be significantly reduced and no odour nuisance will occur at the site boundary or beyond.

Step 2. Determination of the pathway effectiveness. In assessing the pathway effectiveness, the emission point characteristics remain the same for each site. An 'Ineffective Pathway' classification, which limits the transfer of odours from the source to the receptor, was determined. This was based on the likely odour control system to be provided at the proposed RBSF.

The assessment considered the number of receptors within 250m and 500m of the site boundary to provide an indication of potential public exposure. A summary of the investigation of receptors is summarised in Table 9.

Table 9 Odour Receptors considered in assessment of Greenogue site

Receptors within 250m	• 7 residential properties to the south-west of the site boundary • 1 residential property to the east of the site boundary • 1 residential property to the north of the site boundary • Multiple commercial/warehousing units to the north of the site boundary
Additional Receptors within 500m	• Up to 10 residential receptors to the north-west of the site boundary

Analysis of the meteorological data was undertaken to determine the long-term frequency of wind direction at the candidate site. There is a greater potential for odour exposure when there is an elevated proportion of downwind hours as this provides a more effective pathway from the source to the receptor. The predominant wind direction is from the southwest. There are sensitive receptors near to the Greenogue site that are downwind of the proposed RBSF for approximately 40% of the hours in the assessed 30 year meteorological dataset.

Step 3. Definition of Receptor Sensitivity. The assessment has considered that all residential receptors have a high sensitivity to odour impacts while industrial/warehousing uses have a medium sensitivity to odour impacts. The risk assessment is conducted on the basis of the highest sensitivity receptors.

The risk of odour effects was determined by combining the source odour potential, the pathway effectiveness and receptor sensitivity using the IAQM methodology. The results from the qualitative risk-based assessment for candidate site is 'Moderate Adverse Effect'. This result is prior to the application of odour control measures at the proposed facility. When an odour mitigation system has been installed the result of 'Moderate Adverse Effect' will be significantly reduced and no appreciable odour will occur at the site boundary or beyond.

7.2.3 Noise

The Potential Impact Rating for the candidate site, which is based number of noise sensitive areas within four distance bands from the site, was calculated to be 35. This is the highest rating of the five potential sites. The lowest PIR rating was 9 (Gunnocks). This rating indicates a higher potential impact in comparison to the other sites. The assessment identified a total of 19 sensitive receptors within the 300m assessment range. A childcare facility, 285m to the west of site boundary, is included in the receptors identified. No other sensitive receptors (i.e. schools, retirement homes, hospitals) were noted within this range.

The candidate site is located near a national road. A high-level review of the receiving environment from the Dublin Agglomeration Environmental Noise Action Plan indicated the candidate site lies within the 70 to 75 and 65 to 70 decibel level ranges for the day-evening and night time noise indicators respectively. The receiving environment is not located within a *"quiet area"* or area of low background noise.

Due to the extent and proximity of receptors to the site, it is expected that this candidate site could give rise to the most significant noise impacts of the five potential sites as a result of the proposed RBSF development.

7.2.4 Landscape & Visual

The candidate site is located within the *'Newcastle Lowlands'* according to a Landscape Character Assessment (LCA) included in the South Dublin County Council Development Plan 2016-2022. The Newcastle Lowlands landscape area is described as medium overall landscape sensitivity with medium to high landscape value and resulting in a low capacity to change.

There are no landmarks identified in the landscape area near the proposed site. The closest features are two archaeological sites, recorded on the *Record of Monuments and Places* as a possible cist (RMP 021-028) and an enclosure (RMP 021-029), approximately 300 to 400m south of the site. The site itself, and the lands to the east, are generally at 100m contour, and are at the western extent of the flat lowlands before the land begins to rise and gently undulate to the west of the Newcastle Road. The landscape of the overall LCA consists of a mix of small pasture fields with some large arable fields, estate landscapes, and built up areas. The landscape of the immediate site environs is characterised by increasing influence of urban activities closer to the national roads infrastructure, including substantial commercial and industrial development and Baldonnell Airport.

Several elevated protected Views and Prospects are identified within the *South Dublin County Council Development Plan 2016-2022* that are located between 2.5km and 6.0km to the west, south west, south and south east. These protected views include Athgoe Hill, Bustyhill, Windmill Hill, Saggart Hill, Vershoyle's Hill, Lugmore/Tallaght Hill and Knockannavea.

From all such views, the potential impact of development at the site is limited by being seen at considerable distance and against a backdrop of the existing Greenogue Business Park. This existing business park is more extensive than the RBSF. It contains a range of buildings sizes, some of which are comparable in size to the proposed RBSF buildings. Views from the Newcastle Road to the west of the site are also protected, however these views are westwards over the rural lowlands and to the elevated landforms at Athgoe Hill and Bustyhill, and as such are not relevant to the consideration of this site.

7.2.5 Geology & Hydrogeology

The candidate site is underlain by tills derived chiefly from limestone and lower Palaeozoic sandstone and shales with some bedrock near the surface. Depth to bedrock on this site is unknown. Geological Heritage sites were not identified at the site. The proposed site has no previous historical use that might result in the presence of contaminated ground.

A Locally Important Aquifer underlies the candidate site with bedrock which is moderately productive only in local zones. Vulnerability is identified as "High" to "Extreme", with "X-rock" (rock at or near surface) at the northwest corner of the site.

7.2.6 Hydrology

Information regarding flood risk to the candidate site was obtained from Preliminary Flood Risk Assessment (PFRA) Maps, South Dublin County Council Strategic Flood Risk Assessment and OPW records of flooding.

A review of the PFRA map at the candidate site indicated there is minor pluvial flooding on the candidate site. A review of the South Dublin County Council Strategic Flood Risk Assessment indicates that a segment near the centre of the candidate site lies along the fluvial Flood Zone A. This narrow corridor through the site is subject to higher risk of fluvial flooding. Buildings for the proposed development would need to be located outside this corridor. It should be noted that there have been no recorded instances of fluvial flooding within the vicinity of the candidate site.

A review of historical flood events indicated that in October 2011 a flood occurred at Greenogue Business Park downstream of the candidate site. This flood event occurred due to heavy rainfall when surface water accumulated within a natural depression. Records show one property within the business park was directly impacted by this pluvial flooding.

A tributary of the River Griffeen flowing along the eastern boundary of the site is the most likely discharge point for surface water. A review of the FSU Web Portal identified that the run off from the candidate site

discharges to both the abovementioned tributary and River Griffeen. If surface water from the RBSF is discharged to this tributary then further assessment would be required to determine its suitability to convey the additional attenuated flow. This additional flow arises from the redirection of surface water run-off from the River Griffeen to this tributary.

Discharge of surface water westward to the River Griffeen is less preferred due to potential impact on the existing nearby attenuation pond and requirement for access through third party lands. The stream near the centre of the site is not proposed as a discharge point as its conveyance capacity is less than the other options.

The maximum recharge capacity of the soil is approximately 200mm/year and an effective rainfall of 416 mm/year all of which indicate that site contributes a high proportion of surface runoff relative to total precipitation. An initial estimation, using the IoH Report 124 method, shows the expected greenfield discharge rate from the site is approximately 31l/s. Considering the runoff is to be attenuated using suitable sustainable drainage systems, it is not envisaged there will be a sudden increase in flow rates in the adjacent watercourses caused by the increase in impermeable area.

7.2.7 Ecology

The candidate site comprises two large, open fields. The larger western field contains agricultural land with an unidentified arable crop (BC1) present. The smaller eastern field contains improved agricultural grassland, which was not being grazed at the time of the survey. The site contains three mature treelines (WL2) containing Ash, Hawthorn, Elder, Sycamore, Birch and Willow as well as hedgerows (WL1) containing mainly Hawthorn and Elder. The site lies approximately 100m from the River Griffeen, which discharges into the River Liffey in Lucan village approximately 7.5km to the north. The total length of mature treelines, internally on the site, is approximately 200m. The site itself slopes gently to the northeast.

The assessment of the habitats present confirms that the site is of local ecological value only. All the habitats present are common and widespread and none is listed for protection in the EU Habitats Directive. The site is within the catchment of the Griffeen River. This is a tributary of the River Liffey which contains salmonids. This river also discharges to Dublin Bay which contains four Natura 2000s sites designated under the EU Habitats Directive.

7.2.8 Archaeology, Cultural & Architectural Heritage

A review of the *Record of Monuments and Places* established that there are no recorded monuments entered in the database at the candidate site, however there one recorded monument, a low-lying area of rough pasture (DU021-029), situated 225m to the southeast of the candidate site.

A review of the *Sites and Monuments Record* established that there are no undesignated monuments entered in the database at the candidate site, however there is one undesignated monument, a ring-ditch (DU021-103), situated 150m north-east of the candidate site.

An analysis of the 6-inch and 25-inch Ordnance Survey maps at the candidate site or within 200m of the site did not indicate any previously unrecorded archaeological sites or monuments. Examination of aerial imagery did not indicate any additional unrecorded archaeological sites or monuments at the candidate site or within 200m of the site.

A search for reports of archaeological test excavations and licensed monitoring found no such investigations have been carried out at the candidate site or within 200m of the site. An examination of the South Dublin County Development Plan 2016-22 established that there are no buildings listed as protected structures within the boundary or 200m of the candidate site.

A review of the National Inventory of Architectural Heritage (NIAH) found no listed buildings within the boundary or 200m of the candidate site. Furthermore, there are no known heritage sites situated within the boundary, however there is archaeology within 150m to 225m of the candidate site.

7.3 Economic & Engineering

7.3.1 Traffic

The R120 Regional Road is located to the northeast of the proposed site and runs in a northwest/southeast direction. The R120 has a carriageway width of 7.5m and 80kph speed limit within the study area The Annual Average Daily Traffic (AADT) was estimated as 23,044 based on traffic counts.

The N7 National Primary Road is located to the south of the proposed site and runs in a southwest/northeast direction. The N7 has a carriageway width of approximately 23m and 100kph speed limit within the study area. The AADT was recorded as 101,984 vehicles according to TII 2016 traffic counter figures.

The traffic count locations were situated at the roundabouts on the R120 to the east of the site and N7 junction to the west of the site. The counts showed that the morning network peak hour at this location occurred between 08:00 and 09:00 and the evening network peak hour occurred between 16:00 and 17:00.

In terms of access arrangement, the visibility distances of 130m to the right and 140m to the left at the likely access point to the site are adequate when compared to the minimum desirable distance of 90m.

The links on the road network adjoining the potential site are the N7 and the R120 immediately adjacent the proposed site. The assessment found that the N7 is currently operating at approximately 50% over its theoretical capacity and the R120 is operating 100% over its capacity. The provision of the proposed RBSF will result in marginal increases in Ratio of Flow to Capacity on the both the N7 and R120.

A traffic capacity assessment of four key junctions, as shown in the figure below, was undertaken utilising the surveyed traffic flows and traffic modelling software. Roundabouts No. 2 and No. 3 are currently operating over the design threshold and theoretical traffic carrying capacity in the morning peak hour. Queuing lengths at Roundabout 3 is also significant in the morning peak hour. Furthermore, there is an indication from on-site observations by the assessors that this is impacting on the Roundabouts No. 1 and No. 2.

An overall comparative assessment of this site and the other potential sites is provided in section 10.3.1.

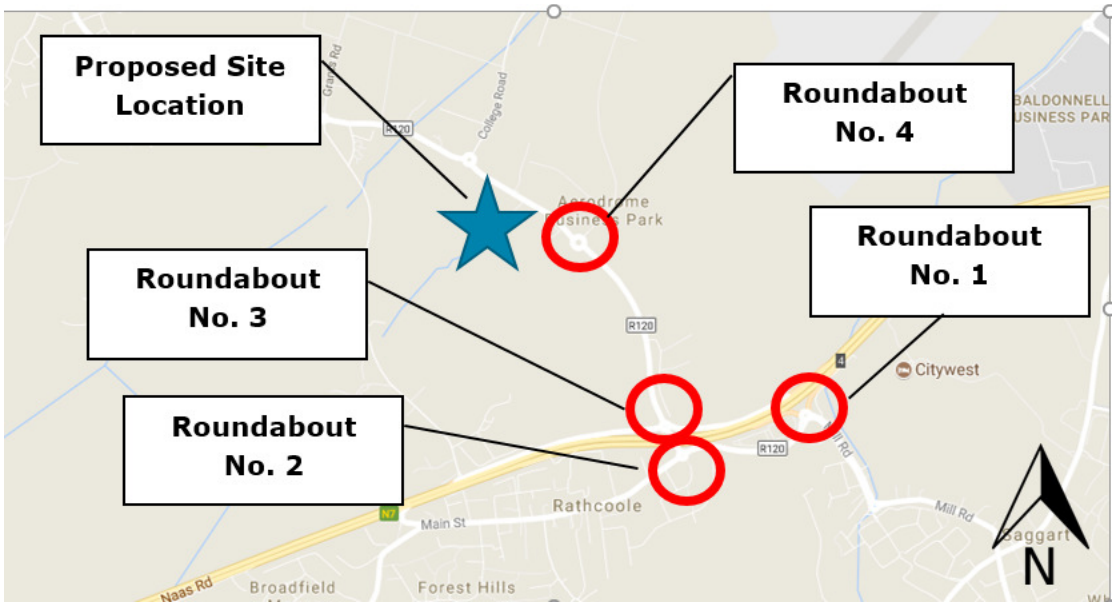

Figure 12 Key Junctions at Greenogue Site

7.3.2 Road Safety

A Road Safety Impact Assessment (RSIA) was undertaken by the assessment team. The negative aspects of the candidate site were the requirement for HGVs exiting the site to turn right onto R120 and the high traffic volumes observed on R120 during the assessment.

An overall comparative assessment of this site and the other potential sites is provided in section 10.3.2.

7.3.3 Service & Utility Connections

The candidate site is currently undeveloped and no services are available on the site itself, however drainage and watermain services are available in the adjacent roads.

Discharge of wastewater is feasible by a connection to the Greenogue Industrial Estate foul network, which connects to the Newcastle pumping station. Surface water discharge could be provided to the River Griffeen tributary which bounds the east of the candidate site. However, the capacity of this watercourse may require further assessment at planning stage if the candidate site is selected. Alternatively, surface water could be discharged to the River Griffeen to the north. This solution would require a route through third party lands.

Potable water is available from a 150mm watermain in the R120 road beside the site.

ESB supply and telecommunications is available at the candidate site.

7.3.4 Geotechnical

The candidate site is underlain by tills derived chiefly from limestone and lower Palaeozoic sandstone and shales with bedrock generally 1-3m below ground level and near surface at the north-eastern side of the site. It is estimated that approximately 0.6m of fill across the building and site development areas may be required at the candidate site in order to provide a level base for construction. Evidence from GSI records do not indicate a requirement for excavation of soft ground or rock excavation at the candidate site. Nor do the records show a presence of karst.

7.3.5 Distance from Biosolids Sources

Haulage vehicles travelling to the candidate site from the biosolids sources will follow the M50 motorway. Vehicles from Ringsend WwTP will join the M50 at Junction 1 (Dublin Port Tunnel), while vehicles from the proposed GDD WwTP will join at Junction 3 near Clonshaugh. Vehicles will continue on the M50 to Junction 9 and then travel on the N7 to Junction 4 of the N7 at Rathcoole. Here, vehicles will join the R120 and travel 2km to the candidate site. The overall transport distance from the source centre point, as defined in section 4.5.5, to the candidate site is 35km.

7.3.6 Capital & Operating Costs

An analysis of the percentage cost difference for the candidate site indicates a range of between 1% and 23% above the Base Cost. The additional cost is attributed to the likely requirement for relatively large volumes of fill material and the potential requirement for channeling or enclosing the existing watercourse.

Transport costs in bringing biosolids to this candidate site during the operation of the facility are estimated to be the highest of the five potential sites.

7.4 Planning

7.4.1 Land Use Zoning

The candidate site is considered in the context of the current *South Dublin County Council Development Plan 2016 – 2022*, which is the statutory land-use plan governing the candidate site. The candidate site does not form part of a Local Area Plan. The site is currently zoned under the plan as 'EE' Enterprise & Employment with the objective "To provide for enterprise and employment related uses."

Under the 'EE' zoning category noted in the development plan a Refuse Transfer Station is 'permitted in principle'. The Development Plan defines a Refuse Transfer Station as "A structure or land usually enclosed and screened and which is used for the temporary storage of waste materials pending transfer to a final disposal facility, or for re-use. The definition includes a baling station, recycling facility, civic amenity facility, materials recovery facility, and materials recycling facility."

The Development Plan further states "Enterprise and Employment (EE) zoned lands will accommodate low to medium intensity enterprise and employment uses."

7.4.2 Planning Policies & Objectives

According to the *South Dublin County Council Development Plan 2016 – 2022*, the policy applied by the Department of Defence at the nearby Casement Aerodrome (military aerodrome) are the *ICAO Standards*

and Recommended Practices. The Department of Defence also applies restricted areas of its own, a circular 'Inner Zone' of 2km radius and a 'Security Zone'. Furthermore, the Development Plan, under IE8 Objective 4, states that it is a policy of the local authority to prohibit and restrict development in the environs of Casement Aerodrome in specific ways such as restricting building heights, controlling activities that may attract birds, and limiting the extent of external lighting, among others.

Similarly, IE8 Objective 1 of the South Dublin County Development Plan states that it is an objective of the council to ensure the safety of military air traffic to and from Casement Aerodrome with full regard for the safety of persons on the ground as well as the necessity for causing the least possible inconvenience to local communities.

A review of the safeguarding zones relating to Casement Aerodrome reveals that the candidate site does not impact on the Inner Approach Area, the Critical Safety Zone, nor the Department of Defence Security Zone. The review shows that a portion of the candidate site lies within the Department of Defence Inner Zone and the Noise Significant Boundary. The Development Plan outlines that no building or structure exceeding 20m in height shall be permitted within the Department of Defence Inner Zone. The Noise Significant Boundary relates to development of residential areas and other land uses impacted by noise, such as nursing homes, schools, hospitals and conference centres.

7.4.3 Planning History & Current Usage

A review of the South Dublin County Council planning database shows no planning history at the candidate site. The land is currently utilised for agricultural purposes and a review of historic maps, both 6-inch and 25-inch, indicate the site has not been subject to a previous development.

7.4.4 Population & Sensitive Receptors

The estimated population within 100m, 250m and 500m of the boundary of the candidate site is summarised in Table 10 below.

Table 10 Estimated Population near Greenogue site

Distance from Site Boundary	***Estimated Population***
100m	11
250m	49
500m	108

There are no hospitals near the candidate site. Peamount Hospital, a facility offering services to older people, was suggested during consultation as a receptor for consideration in site selection. However, the hospital is 2.8km northwest of the candidate site. Greenogue Business Park, Casement Aerodrome, and Newcastle village are located between the candidate site and the hospital. The nearest nursing home is 1.5km to the south of the candidate site on the opposite side of N7 national primary road in the town of Rathcoole.

There are two primary schools and one post-primary school to the southwest of the candidate site on the opposite side of the N7 national primary road in the town of Rathcoole. These schools are located between 600m and 1.4km from the candidate site. There is a childcare facility located 285m to the northwest of the site, a short distance from the R120.

7.4.5 Adjacent Land Use

Greenogue Business Park, located to the northeast of the candidate site, has been subject to several planning applications over a period of 20 years. The Business Park generally comprises light industrial/commercial uses. The following permissions for industrial/warehousing developments are relevant to lands directly adjacent to the candidate site:

- SDCC Reg. Ref. SD03A/0066: Permission was sought by Sandymark Construction Ltd. for a development comprising 98,252 sqm of industrial/warehousing units in 20 no. blocks (varying from 8 to 17m high) including 17,298 sqm of integral related office accommodation on two/three floors together with Alymer Road College Lane Link Road, partial realignment of Aylmer Road and College Lane, partial realignment of River Griffeen and tributaries, provision for park, access roads, outfall drains, service utilities, sub-stations, boundary fences/walls, landscaping, planting, paving parking,

associated site development works and demolition of existing dwelling. The South Dublin County Council decision was appealed to An Bord Pleanala on 16 September 2003 and subsequently granted permission in September 2003.

- SDCC Reg. Ref. SD07A/0048: Permission was sought by Clonmel Enterprises Ltd. for a development comprising a warehousing unit (16.000m high) totalling 4,120sqm including 349 m^2. of ancillary office/staff facilities on 2 floors together with services, utilities, landscaping, planting, paving, parking and site development works. South Dublin County Council granted Permission in April 2007.

7.5 Social and Community

7.5.1 Material Assets

The candidate site is grassland and is located approximately 1.5km to the north of the N7 national primary road. Rathcoole village is located on the southern side of the N7 and residential areas on periphery of Newcastle village are located 1km to the northwest of the site. The site itself is accessed from the R120 regional road via Junction 4 from the N7 National primary road, both of which are designed to accommodate HGV traffic. The candidate site has had no previous historical use that may result in the presence of contaminated ground.

The site is set adjacent to an existing commercial and industrial area with sparse sections of residential housing intertwined within the townlands of Greenogue and Collegeland. The Greenogue and Aerodrome Business Park, situated on the other side of the R120 to the northeast of the candidate site, consists of a mixture of both office and industrial based companies. Casement Aerodrome, a military airport, is 1.5km northeast of the site.

There are two primary schools located within the town of Rathcoole, namely Holy Family National School and Scoil Chrónáin. There are no post primary schools within 2km of the candidate site. There is a creche, Grian na nÓg, located 285m to the northwest of the site boundary. There are no hospitals, nursing homes or primary care units located within the immediate vicinity of the candidate site. There are medical practitioners and Lisheen Nursing Home situated in the town of Rathcoole. Commercials GAA club is located on the adjoining R120 regional road near the junction of the N7. Other amenities and tourist attractions in the surrounding areas include City West Hotel & Golf Club, St. Finans GAA Club, Rathcoole Boys Football Club and Coolmine Equestrian Academy.

The Archaeology, Cultural & Architectural Heritage assessment (section 7.2.8) established that there are no recorded monuments within the site candidate, however there is low-lying area of rough pasture (DU021-029), situated 225m to the south of the candidate site. There are no SPAs or SACs located near the candidate site. However, the River Griffeen and its catchment area discharges to the River Liffey approximately 7km downstream. The Wicklow Mountains SAC (002122), Glenasmole Valley SAC (001209), Rye Water Valley/Carton SAC 001398, Red Bog, Kildare SAC (000397), Wicklow Mountains SPA (004040) and Poulaphouca Reservoir SPA (004063) are located within 15km of the site.

As noted in section 7.3.3 above, services are located in the regional road adjacent to the candidate site. They include a private wastewater sewer, electricity cables, and telecommunications. A 450mm and 150mm watermain are located within the adjacent regional road.

Surface run-off may be required to discharge to the adjacent watercourse on the eastern boundary, which flows into the River Griffeen downstream of Greenogue Business Park.

7.5.2 Neighbourhood Character

The candidate site is situated in a predominantly industrial and commercial area located between two densely populated villages of Rathcoole to the south of the N7 national primary road and Newcastle to the northwest. The proposed RBSF would be of similar size and material to the larger business/warehouse units in the Greenogue Business Park. Furthermore, given the zoning of the lands, it is to be expected that they will be developed for industrial and commercial purposes at some time in the future.

There are one-off houses situated on both sides of the R120 between the N7 junction and Newcastle. At the northeast boundary, there are two houses beside the candidate site and another house on the opposite side of the R120.

8.0 Assessment of Newtown/Kilshane Site

8.1 Site Description

The site comprises 11.4ha of partially developed land. It is situated on the western side of the N2 national primary road and is accessed from the R135. The site is relatively flat. To the west, in Huntstown, there is a quarry and power station. There is a residential property to the east of the site and other one-off housing further from the site in what is a predominantly industrialised townland. The site is currently developed with roads, services, buildings and boundary fencing. A tributary of the River Ward flows along the western boundary of the site.

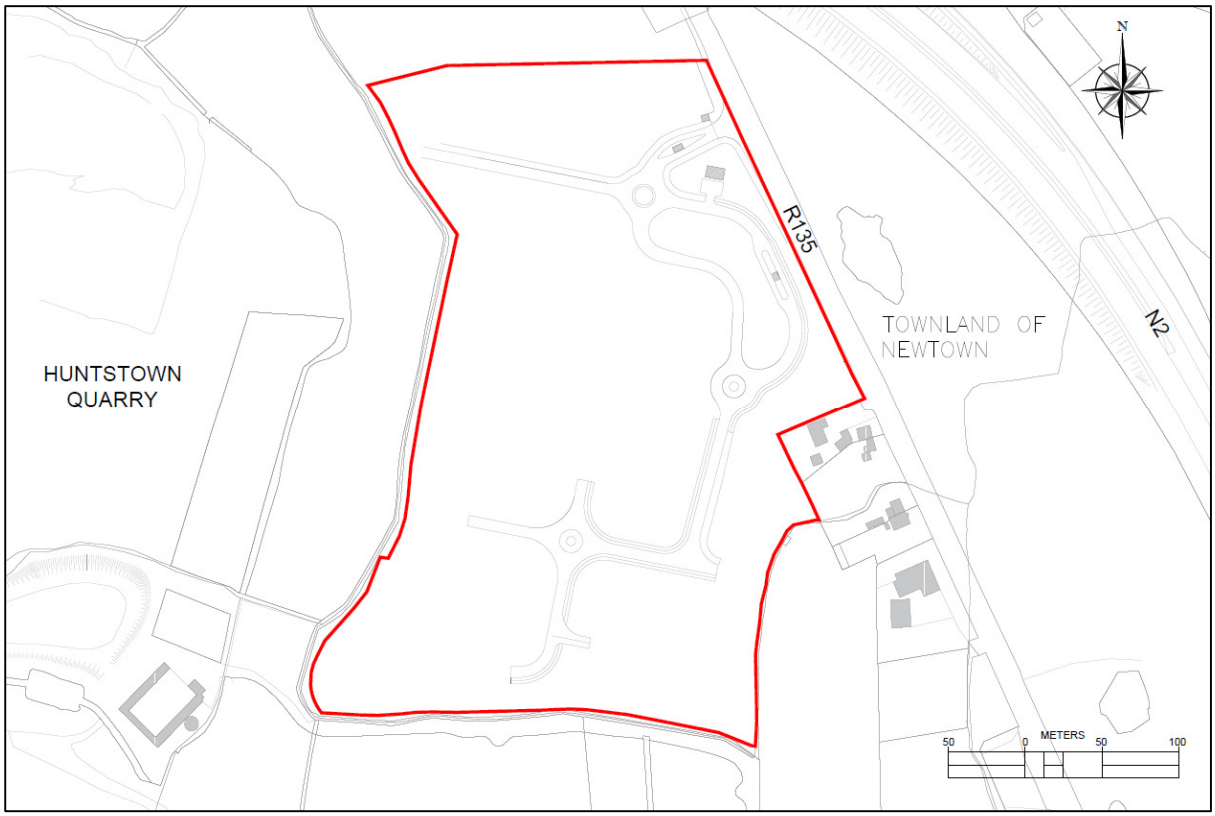

Figure 13 Site Plan at Newtown/Kilshane

8.2 Environmental

8.2.1 Air Quality

When the methodology provided in the TII guidelines is applied to this candidate site it is found that the change in traffic, in terms of impact on air quality and traffic-derived pollutants, would be negligible. The expected impact on air quality is insignificant.

In the assessment of the impact of dust during construction, the number of receptors within 50m of the candidate site boundaries was considered. There is one residential property and a commercial property adjacent to the eastern boundary of the site. These properties are receptors in terms of short-term construction dust impacts. This area also includes the Roadstone Huntstown Quarry which has the potential to cause elevated dust levels in the area. With no mitigation measures in place, it is considered that this site option will have a minor negative impact in terms of dust.

Once consideration is given to standard good practice measures to control dust emissions during the construction phase it is considered that this site option can be developed whilst having no significant air quality impacts.

8.2.2 Odour

The outcome of the 3-step odour assessment, described in section 4.4.2, for an unmitigated scenario at the Newtown/Kilshane site is outlined below.

Step 1. Evaluation of the potential for odour release. The potential for odour release was found to be the same for all sites. As described in section 4.4.2, the odour potential of the RBSF was conservatively classified as Large. This classification was considered appropriate for site selection, but when an odour mitigation system has been installed, the impact of Large odour classification will be significantly reduced and no odour nuisance will occur at the site boundary or beyond.

Step 2. Determination of the pathway effectiveness. In assessing the pathway effectiveness, the emission point characteristics remain the same for each site. An 'Ineffective Pathway' classification, which limits the transfer of odours from the source to the receptor, was determined. This was based on the likely odour control system to be provided at the proposed RBSF.

The assessment considered the number of receptors within 250m and 500m of the site boundary to provide an indication of potential public exposure. A summary of the investigation of receptors is summarised in Table 11.

Table 11 Odour Receptors considered in assessment of Newtown/Kilshane site

Receptors within 250m	• 1 residential property to the south-east of the site boundary
Additional Receptors within 500m	• 3 Residential properties to the north of the site boundary • Industrial/Commercial Units to the south-east of the site boundary

Analysis of the meteorological data was undertaken to determine the long-term frequency of wind direction at the candidate site. There is a greater potential for odour exposure when there is an elevated proportion of downwind hours as this provides a more effective pathway from the source to the receptor. The predominant wind direction is from the southwest. There are sensitive receptors near to the Newtown/Kilshane site that are downwind of the proposed RBSF approximately 8% of the hours in the assessed 30 year meteorological dataset.

Step 3. Definition of Receptor Sensitivity. The assessment has considered that all residential receptors have a high sensitivity to odour impacts while industrial/warehousing uses have a medium sensitivity to odour impacts. The risk assessment is conducted on the basis of the highest sensitivity receptors.

The risk of odour effects was determined by combining the source odour potential, the pathway effectiveness and receptor sensitivity using the IAQM methodology. The results from the qualitative risk-based assessment for candidate site is 'Slight Adverse Effect'. This result is prior to the application of odour control measures at the proposed facility. When an odour mitigation system has been installed the result of 'Slight Adverse Effect' will be significantly reduced and no appreciable odour will occur at the site boundary or beyond.

8.2.3 Noise

The Potential Impact Rating for the candidate site, which is based number of noise sensitive areas within four distance bands from the site, was calculated to be 13. The lowest PIR rating was 9 (Gunnocks) and the highest rating was 35 (Greenogue). This rating of 13 indicates a lower potential impact in comparison to the other sites. The assessment identified a total of 5 sensitive receptors within the 300m assessment range. No other sensitive receptors (i.e. schools, retirement homes, hospitals) were noted within this range.

The candidate site is located near a national road. A high-level review of the receiving environment from the Dublin Agglomeration Environmental Noise Action Plan indicated the candidate site lies within the 60 to 70 and 55 to 60 decibel level ranges for the day-evening and night time noise indicators respectively. The receiving environment is not located within a *"quiet area"* or area of low background noise.

The candidate site is located such that the prevailing noise climate will be significantly higher than the limits applicable to the proposed development.

8.2.4 Landscape & Visual

The candidate site is a previously planned and partially developed waste recycling facility which is set within an existing/emerging industrial context within a wider mix of uses (i.e. agricultural, industrial and commercial) that is interspersed with small settlements. The Fingal County Development Plan 2017-2023 does not identify Views and Prospects within the locality which would influence development on the candidate site. While the R135 retains some of its rural characteristics, its proximity to large scale power generation, extractive industries and the recent N2 upgrade, is such that the industrial and employment character of the locality is prominent. No particular landmarks are identified within the proposed site as part of the assessment however there are some cultural heritage structures noted on the Fingal County Development Plan 2017-2023 which are discussed further in section 8.2.8.

8.2.5 Geology & Hydrogeology

The candidate site is underlain by tills derived chiefly from limestone described as a sandy gravelly clay. Huntstown Quarry, adjacent to the candidate site, is designated a County Geological Site (CGS) and may be recommended for geological Natural Heritage Area as the quarry shows the base of the Tober Colleen Formation where it directly overlies Waulsortian.

The proposed development at the candidate site would have the potential to prevent potential future quarrying of the rock material. However, as the site is partially developed for a recycling park the option to quarry has already been eliminated at this site. The proposed site has no previous historical use that may result in the presence of contaminated ground. A Locally Important Aquifer underlies the candidate site with bedrock which is moderately productive only in local zones. Vulnerability is identified as “Extreme” to “X-rock” (rock at or near surface) according to GSI mapping information, however site-specific borehole information obtained from a historic site investigation indicates a depth to rock of 13m to 22m which consists of a sandy gravelly clay overburden. Consequently, the vulnerability classification is considered Low.

8.2.6 Hydrology

All information regarding flood risk to the candidate site was obtained from Preliminary Flood Risk Assessment Maps, Fingal County Council Strategic Flood Risk Assessment and from OPW records of flooding. No CFRAM or FEMFRAM flood maps were available for the candidate site during this assessment. A review of the PFRA map at the candidate site indicated there is minor pluvial flooding on the candidate site.

A previous EIS for a proposed development on the site identified that a tributary stream to the River Ward flows in a northerly direction along the western boundary of the potential site. This tributary, to which the candidate site naturally drains, discharges to the River Ward approximately 4.5km northeast of the site at Owens Bridge, thus the site is located within the River Ward catchment. A review of the FSU portal confirms the candidate site is contained within the catchment of the River Ward.

A review of historical flood events indicated that in November 2002 a flood occurred at Kilshane Cross downstream of the potential site. This flood event occurred due to surface water accumulating from the surrounding grasslands. A 2005 report from Fingal County Council has identified that drainage works took place as part of road development works to alleviate this problem.

As the existing site already drains to the tributary to the River Ward, and all runoff will be attenuated and discharged at greenfield rates it is not envisaged that there will be an increase in flow volume or peak flow rates to this tributary, therefore no impact is expected to the existing flood regime downstream of the site.

The development at this site is likely to require a discharge of surface water to this stream. An initial estimation, using the IoH Report 124 method, shows the expected greenfield discharge rate from the site is approximately 26l/s. It is not envisaged that this runoff will have a detrimental effect on the streams ability to convey flow as the runoff will be attenuated and discharged to the stream at greenfield rates.

8.2.7 Ecology

The candidate site has been developed and comprises mainly sections of grassland separated by a road network. Most of the sections contain amenity grassland (GA2) of varying sizes. To the north of the site, lying

behind a grassy berm, there is an area of semi-natural, dry meadow grassland (GS2) with some areas of damp ground being actively grazed by horses. The site contains one mature treeline (WL2) comprises Elder and Hawthorn and hedgerows (WL1) containing mainly Hawthorn and Elder. There are no mature treelines on the internal part of the site. A tributary of the Ward River borders the south-west corner of site and the site slopes very gently to the northeast, the same direction as this watercourse.

The assessment of the habitats present confirms that the site is of local ecological value only. All the habitats present are common and widespread and none is listed for protection in the EU Habitats Directive. The proximity of the site to a tributary of the Ward River increases site importance as the river contains salmonids. This river also discharges to Broadmeadow/Malahide Estuary which is a Natura 2000 site designated under the EU Habitats Directive.

8.2.8 Archaeology, Cultural & Architectural Heritage

A review of the *Record of Monuments and Places* established that there are no recorded monuments entered in the database at the candidate site, however there is a levelled recorded monument (Castle - motte and bailey DU014-013), situated adjacent to the candidate site.

A review of the *Sites and Monuments Record* established that there are no undesignated monuments entered in the database at the candidate site or within 200m of the site.

An analysis of the 6-inch and 25-inch Ordnance Survey maps at the candidate site or within 200m of the site did not indicate any previously unrecorded archaeological sites or monuments. Examination of aerial imagery did not indicate any additional unrecorded archaeological sites or monuments at the candidate site or within 200m of the candidate site.

A search for reports of archaeological test excavations and licensed monitoring found investigations have been carried out on the candidate site and within 200m of the candidate site. These test (SMR 14:13: 01E1214, SMR 14:13: 08E0043) investigations were carried out as part of an assessment for a waste recycling park in 2001 and 2008. These assessments identified no archaeology through testing and monitoring of the candidate site.

An examination of the Fingal County Development Plan 2017-2023 established that there are no buildings listed as protected structures within the boundary, however there is one protected structure, Kilshane Moat (RPS No. 662), situated within the vicinity of the land parcel. It should be noted that Kilshane Church (in ruins) and Holy Well were deleted from the Fingal Record of Protected Structures in September 2016. A review of the National Inventory of Architectural Heritage (NIAH) found no listed buildings within the boundary or 200m of the candidate site.

8.3 Economic & Engineering

8.3.1 Traffic

The L3120 Local Road is located to the north of the proposed site and runs in an east/west direction. The L3120 has a carriageway width of 7.5m and 80kph speed limit within the study area The Annual Average Daily Traffic (AADT) was estimated as 8,833 based on traffic counts.

The R135 Regional Road is located to the east of the proposed site and runs in a north/south direction. The R135 has a carriageway width of 12.5m and 60kph speed limit within the study area The Annual Average Daily Traffic (AADT) was estimated as 5,783 based on traffic counts.

The N2 National Primary Road is located to the east of the proposed site locations and runs in a north/south direction. The N2 has a carriageway width of approximately 25m and a 100kph speed limit within the study area. The AADT was recorded as 35,349 vehicles according to TII 2016 traffic counter figures.

The traffic count locations were situated at the junctions on the R135 to the north and south of the candidate site. The counts showed that the morning network peak hour at this location occurred between 08:00 and 09:00 and the evening network peak hour occurred between 17:00 and 18:00.

In terms of access arrangement, the visibility distances of 200m to the right and 210m to the left at the likely access point to the site are adequate when compared to the minimum desirable distance of 90m.

The links on the road network adjoining the potential site are the N2 and the R135 immediately adjacent the proposed site. The assessment found that the N2 is currently operating at approximately 53% of its theoretical capacity and the R135 is operating 37% of its capacity. The provision of the proposed RBSF will result in marginal increases in Ratio of Flow to Capacity on the both the N2 and R135.

A traffic capacity assessment of key junctions, as shown in the figure below, was undertaken utilising the surveyed traffic flows and traffic modelling software.

It was found that priority junction No. 1 is currently operating within its capacity in the evening peak hour but was operating over the design traffic capacity threshold in morning peak hour. However, traffic volumes at this junction were still within its theoretical traffic carrying capacity in the morning peak period.

It is worth noting that vehicles accessing the candidate site would utilise priority junction No.1 to join the R135 from the N2 and vehicles exiting the site would take a separate route to the N2 via junction No.2. The traffic signal junction No. 2 was found to operate well within the design traffic capacity threshold during both the morning and evening peak hours.

An overall comparative assessment of this site and the other potential sites is provided in section 10.3.1.

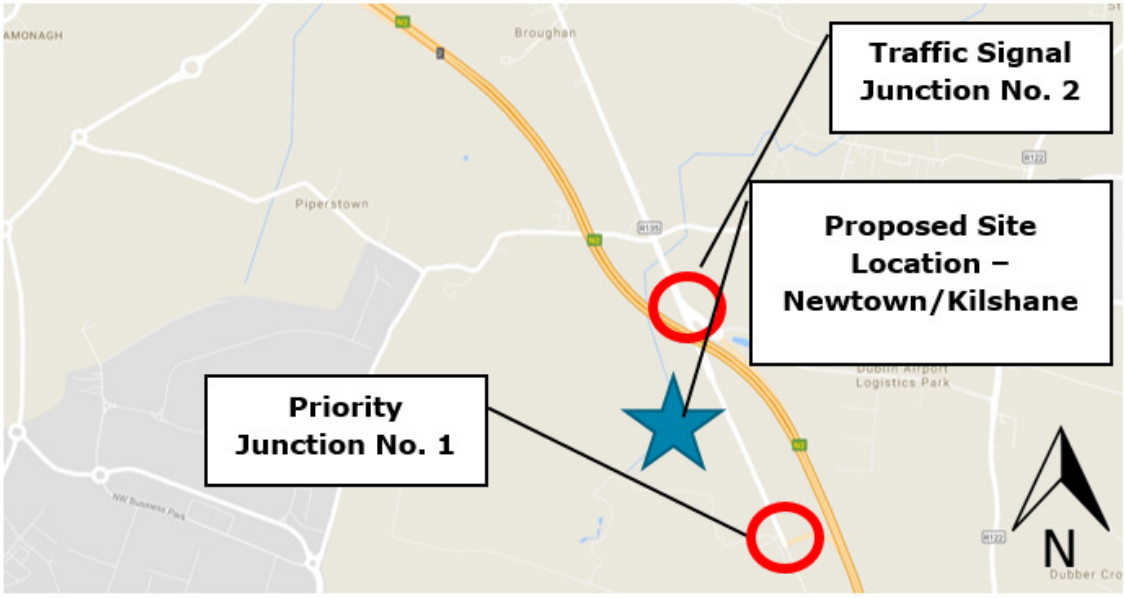

Figure 14 Key Junctions at Newtown/Kilshane Site

8.3.2 Road Safety

A Road Safety Impact Assessment (RSIA) was undertaken by the assessment team. It was found that the positive safety aspects of the candidate site are the low existing traffic volumes on R135 at the site entrance/exit and the 'left-in, left-out' traffic arrangement that can be implemented. Vehicles will arrive at the proposed development from the south and will make a left turn to the enter the site. Vehicles leaving must turn left and travel north to join the N2. This will minimise potential conflicts with vehicles past the site.

A negative aspect of the candidate site is the potential impact on queuing lengths at the junction of the slip lane from the N2 and the R135. The traffic counts show queuing in the morning rush hour. Additional traffic could increase this queue length back towards the N2. This could be mitigated through re-design of the junction and further investigation at planning stage would be required.

An overall comparative assessment of this site and the other potential sites is provided in section 10.3.2.

8.3.3 Service & Utility Connections

The candidate site is currently serviced by existing wastewater and surface water drainage, power and telecommunications. These services were installed as part of the construction works for a planned waste recycling park, which is discussed further in section 8.4. It is expected that most of these services can be

retained for proposed development and the main service points adjacent to the candidate site will remain available.

8.3.4 Geotechnical

Site investigation information from 2002 was referred to for the assessment of the candidate site. It shows rock head level ranges from 13 to 22 metres below ground level and comprises tills derived chiefly from limestone described as sandy gravelly clay and organic clay near surface.

Organic clay was encountered to 0.6m below ground level. If this material is still in-situ, it will require removal and replacement with suitable fill. This material will be suitable for use in bunds across the site. It may have been removed when the site was previously developed. While buildings were never constructed, internal roads and landscaping earth bunds were completed. However, this could not be confirmed during the assessment.

There is no requirement for rock excavation and there is no known presence of karst.

8.3.5 Distance from Biosolids Sources

Haulage vehicles travelling to the candidate site from the biosolids sources will follow the M50 motorway. Vehicles from Ringsend WwTP will join the M50 at Junction 1 (Dublin Port Tunnel), while vehicles from the proposed GDD WwTP will join at Junction 3 near Clonshaugh. Vehicles will continue on the M50 to Junction 5 and then travel 1.3km along the N2 and will leave the N2 at a slip road leading to the R135. Once on the R135, they will travel 650m to the candidate site. The overall transport distance from the source centre point, as defined in section 4.5.5, to the candidate site is 18km.

8.3.6 Capital & Operating Costs

An analysis of the percentage cost difference for the candidate site indicates a range of between 5% and 22% below the Base Cost. The reduction arises from the feasibility of incorporating the existing infrastructure into the proposed development and the proximity of Huntstown Quarry, which can readily provide construction materials for construction.

Transport costs in bringing biosolids to this candidate site during the operation of the facility are estimated to be 15% less than that of the site with the highest cost, namely Greenogue.

8.4 Planning

8.4.1 Land Use Zoning

The candidate site is considered in the context of the current Fingal County Council Development Plan 2017 – 2023, which is the statutory land-use plan governing the candidate site. The candidate site does not form part of a Local Area Plan. The site is currently zoned under the plan as *HI - Provide for heavy industry.*

Under 'HI' zoning category noted in the development plan, a Waste Disposal and Recovery Facility (High Impact) is a use which is 'permitted in principle'. The Development Plan states that 'HI' zoned land shall "facilitate opportunities for industrial uses, activities and processes which may give rise to land use conflict if located within other zonings. Such uses, activities and processes would be likely to produce adverse impacts, for example by way of noise, dust or visual impacts. HI areas provide suitable and accessible locations specifically for heavy industry and shall be reserved solely for such uses."

8.4.2 Planning Policies & Objectives

The Fingal County Development Plan 2017 – 2023 refers to Local Objective 78 within the general area of the candidate site, which states "Facilitate the development of infrastructure for waste management, including construction and demolition waste processing, biological treatment of organic waste, a sludge treatment facility and a waste transfer station."

Huntstown power station, located 300m to the south of the candidate site, is classified as a lower tier Seveso III site under the Fingal County Council Development Plan 2017 – 2023. The power station was granted planning permission under F98A/1313.

The *Fingal County Development Plan 2017 – 2023* includes objectives in relation to development near Dublin Airport. The plan's objectives outline commitments to the promotion of appropriate land use patterns in the

vicinity of the flight paths. It states that the Council will take into account relevant publications issued by the Irish Aviation Authority in respect of the operations of and development in and around Dublin Airport and will take account of the advice of the Irish Aviation Authority with regard to the effects of any development proposals on the safety of aircraft or the safe and efficient navigation thereof.

The Development Plan shows the Public Safety Zones and Noise Zones for Dublin Airport. The candidate site is located within the Dublin Airport Outer Noise Zone. While the northeast corner of the sites appears to be at the boundary of the Outer Public Safety Zone, the majority of the site and any proposed buildings will be outside the zone.

8.4.3 Planning History & Current Usage

There is a previously granted planning permission pertaining to the candidate site based on database available from Fingal County Council and a review of An Bord Pleanála applications. The land is partially developed for industrial purposes and a review of historic maps, both 6-inch and 25-inch, would suggest the site has not been subject to development prior to 2006.

In mid-2016 Irish Water became aware of this site and the planning permission granted in 2006 for a wastewater sludge hub, a construction and demolition waste facility, waste transfer facility and a composting facility. These facilities were not developed on the site although Fingal County Council, as owner of the site, has constructed internal roads and services in accordance with planning permission PLO6F.EL.2045. An Bord Pleanála considered that once compliance with the Conditions of the permission were met and the proposed development being constructed and operated in accordance with a Waste Licence from EPA, then the proposed development "would not have an unacceptable impact on the amenities of residential properties in the vicinity, would not seriously injure the visual amenities of the area, would not interfere to any significant extent with exiting land uses in the vicinity, would not be likely to result in significant adverse effects on the environment, would not have a significant effect on the archaeological heritage of the area, would be acceptable in terms of traffic safety and convenience, would not be contrary to the proper planning and sustainable development of the area."

8.4.4 Population & Sensitive Receptors

The estimated population within 100m, 250m and 500m of the boundary of the candidate site is summarised in Table 12 below.

Table 12 Estimated Population near Newtown/Kilshane site

Distance from Site Boundary	***Estimated Population***
100m	8
250m	11
500m	27

There are no hospitals or nursing homes near the candidate site. The nearest school is St Margaret's National School, which is 2km northeast of the candidate site.

8.4.5 Adjacent Land Use

There is an adjoining site to the east of the Newtown Kilshane site which has had a recent planning permission (FCC Reg. Ref. FW14A/0162). Permission was sought by the Peter McVerry Trust for development comprising the demolition of existing two two-storey semi-detached dwellings with single storey extensions to rear and construction of six one-bedroom, single storey houses and single storey community building containing sitting room, meeting room and offices in two blocks and all associated site works. Fingal County Council granted permission in April 2015 but the permission has yet to be implemented.

At the time of this planning application the site was designated under Local Objective 418 of the *Fingal County Development Plan 2011 – 2017* which aims to "provide for additional units to accommodate homeless persons". This Local Objective is no longer identified in the current Development Plan as an objective for this area. This permission was granted at a time when the Permission for the Council's Waste Facility was active.

A planning permission was granted in May 2017 for the nearby Huntstown Quarry to the east of the candidate site. FCC Reg. Ref. FW17A/0012, which was sought by Roadstone Ltd., provides for continuation and

intensification of waste recovery activity at the established construction and demolition waste recovery facility (Planning Ref. F02A/0602) on a 1.9-hectare site within the central quarry in the immediate near-term (up to 2-3 years). It also provides for relocation of construction and demolition waste recovery activities to the north-eastern corner of the Huntstown Quarry Complex and construction of a hardstanding area, waste processing shed, surface water processing shed, surface water management infrastructure and internal access roads at the new recovery facility. The proposed development requires a review of the existing waste licence by the Environmental Protection Agency.

8.5 Social and Community

8.5.1 Material Assets

The candidate site is partially developed at present and is located approximately 1.5km to the northwest of the M50 motorway, where most of the population (i.e. electoral division) is situated, and 1.5km west of Dublin Airport. The site is set within an industrial area with some sparse areas of residential housing situated predominantly in an industrial setting of the townlands of Newtown, Kilshane and Huntstown. The development works onsite include the installation of drainage networks, road infrastructure, boundary treatments, administrative buildings, power and telecommunications infrastructure. An ESB 110kV overhead transmission line and a 38kV underground cable traverse the southwestern corner of the candidate site. There is a proposal to build a new 1000mm watermain to replace the existing Ballycoolen to Kingstown trunk main located approximately 200m to the north of the candidate site.

The site is accessed from the R135 regional road via Coldwinters exit from the N2 National primary road, both of which are intended for HGV movements. Huntstown Quarry and Power Station adjoin the site to the west and south respectively; the second of these being noted as a lower tier Seveso III site, which is a site which must be managed to avoid the risk of a major accident involving dangerous substances. Dublin Airport is located 1.2km to the east of the candidate site, however the site is situated outside the flight paths. There are no schools, hospitals or other amenities located within 1km of the candidate site.

The Huntstown Quarry, adjacent to the site, would have quarry assets which potentially extend into the candidate site. However, quarrying would be prevented due to the partially developed recycling park. The quarry is designated a County Geological Site (CGS) and may be recommended for geological Natural Heritage Area as the quarry demonstrates the base of the Tober Colleen Formation where it directly overlies Waulsortian. The site has no previous historical use that may result in the presence of contaminated ground.

A review of the Archaeology, Cultural & Architectural Heritage, refer to section 8.2.8 above, established that there are no recorded monuments within the site candidate, however there is a levelled recorded monument (Castle - motte and bailey, DU014-013) situated to the north of the candidate site. Site investigations confirmed that this asset remains outside the candidate site.

There are no SPAs or SACs located within or adjacent to the candidate site. The River Ward and its catchment area discharges to the Malahide Estuary SAC (000205) and Broadmeadow/Swords Estuary SPA (004025) approximately 12km downstream. South Dublin Bay cSAC (000210), Rye Water Valley/Carton SAC (001398), Malahide Estuary SAC (000205), North Dublin Bay cSAC (000206), Howth Head cSAC (000202), South Dublin Bay and River Tolka Estuary SPA (004024), North Bull Island SPA (004006), Baldoyle Bay SPA (004016), Broadmeadow/Swords Estuary SPA (004025) and Rogerstown Estuary SPA (004015) are within 15km of the site.

8.5.2 Neighbourhood Character

The site is located within a predominantly heavy industry area with some sparsely located commercial businesses and residential areas. The nearest densely populated areas are located to the south of the M50 motorway. The heavy industrial areas are primarily situated north of the M50 motorway and to the west of the candidate site.

While the area retains some of its rural characteristics, its proximity to large scale power generation, extractive industries and the recent N2 upgrade, is such that the industrial and employment character of the locality predominates.

9.0 Assessment of Kilshane Site

9.1 Site Description

The site comprises 11.3ha of agricultural crop and grasslands. It is situated on the western side of the N2 national primary road and is accessed from the L3120. The site is relatively flat. To the south, in Huntstown, there is a quarry and power station. There are four residential properties to the north of the site, one of which is located near the boundary at the northwest corner. A tributary of the River Ward is located to the south.

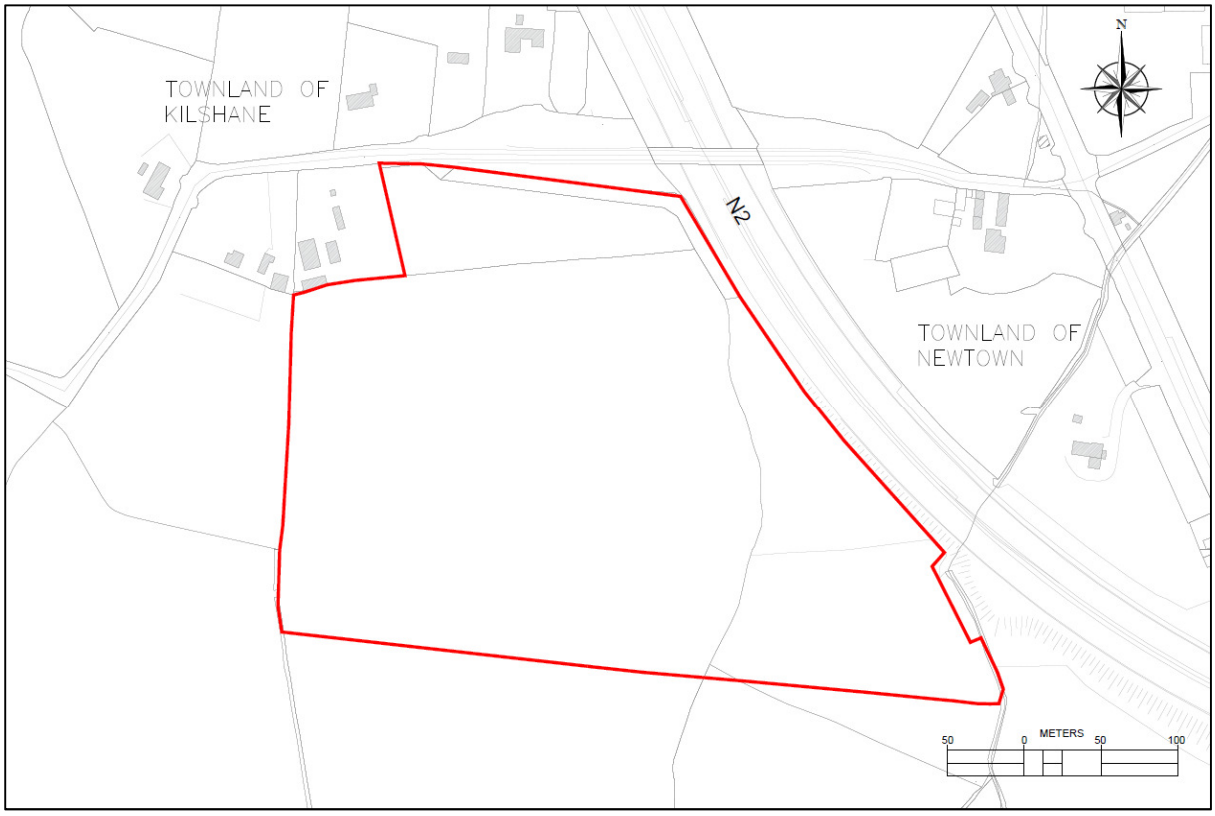

Figure 15 Site Plan at Kilshane

9.2 Environmental

9.2.1 Air Quality

When the methodology provided in the TII guidelines is applied to this candidate site it is found that the change in traffic, in terms of impact on air quality and traffic-derived pollutants, would be negligible. The expected impact on air quality is insignificant.

In the assessment of the impact of dust during construction, the number of receptors within 50m of the candidate site boundaries was considered. There are two residential properties to the north and west of the site boundary. These properties are receptors in terms of short-term construction dust impacts. The Roadstone Huntstown Quarry, which is approximately 200m from the candidate site, has the potential to cause elevated dust levels in the area. It is considered that this site option will have a minor negative dust impact with no mitigation measures in place.

Once consideration is given to standard good practice measures to control dust emissions during the construction phase it is considered that this site option can be developed whilst having no significant air quality impacts.

9.2.2 Odour

The outcome of the 3-step odour assessment, described in section 4.4.2, for an unmitigated scenario at the Kilshane site is outlined below.

Step 1. Evaluation of the potential for odour release. The potential for odour release was found to be the same for all sites. As described in section 4.4.2, the odour potential of the RBSF was conservatively classified as Large. This classification was considered appropriate for site selection, but when an odour mitigation system has been installed, the impact of Large odour classification will be significantly reduced and no odour nuisance will occur at the site boundary or beyond.

Step 2. Determination of the pathway effectiveness. In assessing the pathway effectiveness, the emission point characteristics remain the same for each site. An 'Ineffective Pathway' classification, which limits the transfer of odours from the source to the receptor, was determined. This was based on the likely odour control system to be provided at the proposed RBSF.

The assessment considered the number of receptors within 250m and 500m of the site boundary to provide an indication of potential public exposure. A summary of the investigation of receptors is summarised in Table 11.

Table 13 Odour Receptors considered in assessment of Kilshane site

Receptors within 250m	• 4 residential property to the northwest of the site boundary • 5 residential property to the northeast of the site boundary
Additional Receptors within 500m	• None

Analysis of the meteorological data was undertaken to determine the long-term frequency of wind direction at the candidate site. There is a greater potential for odour exposure when there is an elevated proportion of downwind hours as this provides a more effective pathway from the source to the receptor. The predominant wind direction is from the southwest. There are sensitive receptors near to the Kilshane site that are downwind of the proposed RBSF for approximately 12% of the hours in the assessed 30 year meteorological dataset.

Step 3. Definition of Receptor Sensitivity. The assessment has considered that all residential receptors have a high sensitivity to odour impacts while industrial/warehousing uses have a medium sensitivity to odour impacts. The risk assessment is conducted on the basis of the highest sensitivity receptors.

The risk of odour effects was determined by combining the source odour potential, the pathway effectiveness and receptor sensitivity using the IAQM methodology. The results from the qualitative risk-based assessment for candidate site is 'Slight Adverse Effect'. This result is prior to the application of odour control measures at the proposed facility. When an odour mitigation system has been installed the result of 'Moderate Adverse Effect' will be significantly reduced and no appreciable odour will occur at the site boundary or beyond.

9.2.3 Noise

The Potential Impact Rating for the candidate site, which is based number of noise sensitive areas within four distance bands from the site, was calculated to be 23. The lowest PIR rating was 9 (Gunnocks) and the highest rating was 35 (Greenogue). This rating of 23 indicates a higher potential impact in comparison to the 3 of the other sites, but a lower potential impact than Greenogue. The assessment identified a total of 12 sensitive receptors within the 300m assessment range. No other sensitive receptors (i.e. schools, retirement homes, hospitals) were noted within this range.

The candidate site is located near a national road. A high-level review of the receiving environment from the Dublin Agglomeration Environmental Noise Action Plan indicated the candidate site lies within the 60 to 70 and 55 to 60 decibel level ranges for the day-evening and night time noise indicators respectively. The receiving environment is not located within a "quiet area" or area of low background noise.

Depending on the site layout there is potential for moderate negative impacts to occur due to the extent and proximity of receptors as a result of the proposed RBSF in this location.

9.2.4 Landscape & Visual

The candidate site substantially comprises agricultural fields with increasing influence of industrial and infrastructural activities in the immediate locality, and set within a wider context comprising a mix of agricultural, industrial and commercial uses, interspersed with small settlements. No particular landmarks are identified within the proposed site as part of the assessment however, there is some cultural heritage structures noted on the Fingal County Development Plan 2017-2023, which are discussed in section 9.2.8. The Fingal County Development Plan 2017-2023 does not identify Views and Prospects within the locality which would influence development on the candidate site.

It is also noted that a portion of the site is identified as a nature development area in the Fingal County Development Plan 2017-2023.

9.2.5 Geology & Hydrogeology

The candidate site is underlain by tills derived chiefly from limestone and depth to bedrock is unknown. Geological Heritage sites were not identified at the site. The proposed site has no previous historical use that might result in the presence of contaminated ground.

Huntstown Quarry, adjacent to the candidate site, is designated a County Geological Site (CGS) and may be recommended for geological Natural Heritage Area as the quarry shows the base of the Tober Colleen Formation where it directly overlies Waulsortian.

A Locally Important Aquifer underlies the candidate site with bedrock which is moderately productive only in local zones. Vulnerability is identified as “High” to “Extreme” with “X-rock” (rock at or near surface) at the northwest corner of the site.

9.2.6 Hydrology

Information regarding flood risk at the candidate site was obtained from the Preliminary Flood Risk Assessment Maps, Fingal County Council Strategic Development Plan and from OPW records of flooding within the vicinity of the site. No CFRAM or FEMFRAM flood maps were available for the candidate site at the time of the assessment.

A review of the PFRA map at the candidate site indicated there is minor pluvial flooding on the candidate site.

A review of historical flood events indicated that in November 2002 a flood occurred at Kilshane Cross downstream of the potential site. This flood event occurred due to surface water accumulating from the surrounding grasslands. A 2005 report from Fingal County Council has identified that drainage works took place as part of road development works to alleviate this problem.

The Flood Studies Update (FSU) portal identifies the candidate site is contained within the River Ward catchment. A tributary to the River Ward flows in a north-easterly direction at the southern boundary of the candidate site. The site topography slopes in a southerly direction with run off naturally discharging to the adjacent River Ward tributary. The most likely outfall for surface runoff is to this tributary.

As the existing site already drains to the tributary to the River Ward, and all runoff will be attenuated and discharged at greenfield rates it is not envisaged that there will be an increase in flow volume or peak flow rates to this tributary, therefore no impact is expected to the existing flood regime downstream of the site.

The development at this site is likely to require a discharge of surface water to this stream. An initial estimation, using the IoH Report 124 method, shows the expected greenfield discharge rate from the site is approximately 26l/s. It is not envisaged that this runoff will have a detrimental effect on the streams ability to convey flow as the runoff will be attenuated and discharged to the stream at greenfield rates.

9.2.7 Ecology

The candidate site comprises four fields of varying sizes. The largest, lying to the south-west of the site contains an unidentified arable agricultural crop (BC1) which extends past the site boundary to the south. The field nearest the L3120 is approximately triangular and contains semi-natural, dry meadow grassland (GS2) with some damp grassland vegetation. The triangular field to the east of the site contains improved agricultural grassland that was heavily grazed at the time of the survey. Aerial images of the field to the south-

east of the site shows that it is approximately rectangular and most likely contains improved agricultural grassland. The candidate site contains three mature treelines (WL2) comprising of Ash, Hawthorn and an unidentified conifer species as well as several hedgerows (WL1) containing Ash, Hawthorn, Birch and Elder. The total length of mature treelines, internally on the site, is approximately 300m. The site is approximately 100m from a tributary of the Ward River and slopes gently to the south.

The assessment of the habitats present confirms that the site is of local ecological value only. All the habitats present are common and widespread and none is listed for protection in the EU Habitats Directive. The proximity of the site to a tributary of the Ward River increases the site's importance as the river contains salmonids. This river also discharges to Broadmeadow/Malahide Estuary which is a Natura 2000 site designated under the EU Habitats Directive.

9.2.8 Archaeology, Cultural & Architectural Heritage

A review of the *Record of Monuments and Places* database established that there are no recorded monuments at the candidate site. However, there are four recorded monuments to the south of the site. These include three monuments, Church Kilshane (DU014-012001), Burial ground Kilshane (DU014-012002) and Ritual site - holy well Kilshane (DU014-012003), all of which are not visible at ground level and have been extensively quarried.

A review of the *Sites and Monuments Record* established that there are no undesignated monuments at the candidate site or within 200m of the site boundary. One of the recorded monuments, a Castle - motte and bailey (DU014-013) is located 90m to the southeast of the candidate site. It is visible from aerial photography and its presence was confirmed through archaeological investigation.

An analysis of the 6-inch and 25-inch Ordnance Survey maps at the candidate site and within 200m of the site boundary did not indicate any previously unrecorded archaeological sites or monuments. Examination of the aerial imagery did not indicate any additional unrecorded archaeological sites or monuments at the candidate site or within 200m of the site boundary. A search for reports of archaeological test excavations and licensed monitoring found no investigations have been carried out on the candidate site. However, investigations were carried out as part of an assessment for a waste recycling park in 2001 and 2008 within 200m of the candidate site. These assessments identified no archaeology through testing and monitoring to the south of the known Castle – motte and bailey.

An examination of the Fingal County Development Plan 2017-2023 established that there are no buildings listed as protected structures within the boundary, however there is one protected structure, Kilshane Moat (RPS No. 662), situated within 200m of the site. It should be noted that Kilshane Church (in ruins) and Holy Well were deleted from the Fingal Record of Protected Structures in September 2016. A review of the National Inventory of Architectural Heritage (NIAH) found no listed buildings within the boundary or 200m of the candidate site.

9.3 Economic & Engineering

9.3.1 Traffic

The L3120 Local Road is located to the north of the proposed site and runs in an east/west direction. The L3120 has a carriageway width of 7.5m and 80kph speed limit within the study area The Annual Average Daily Traffic (AADT) was estimated as 8,833 based on traffic counts.

The R135 Regional Road is located to the east of the proposed site and runs in a north/south direction. The R135 has a carriageway width of 12.5m and 60kph speed limit within the study area The Annual Average Daily Traffic (AADT) was estimated as 5,783 based on traffic counts.

The N2 National Primary Road is located to the east of the proposed site locations and runs in a north/south direction. The N2 has a carriageway width of approximately 25m and a 100kph speed limit within the study area. The AADT was recorded as 35,349 vehicles according to TII 2016 traffic counter figures.

The traffic count locations were situated at the junctions on the R135 to the north and south of the candidate site. The counts showed that the morning network peak hour at this location occurred between 08:00 and 09:00 and the evening network peak hour occurred between 17:00 and 18:00.

In terms of access arrangement, the visibility distances of 140m to the right and 90m to the left at the likely access point to the site are adequate when compared to the minimum desirable distance of 160m.

The links on the road network adjoining the potential site are the N2 and the R135 immediately adjacent the proposed site. The assessment found that the N2 is currently operating at approximately 53% of its theoretical capacity and the R135 is operating 37% of its capacity. The provision of the proposed RBSF will result in marginal increases in Ratio of Flow to Capacity on the both the N2 and R135.

A traffic capacity assessment of three key junctions, as shown in the figure below, was undertaken utilising the surveyed traffic flows and traffic modelling software.

It was found that priority junction No. 1 is currently operating within its capacity in the evening peak hour but was operating over the design traffic capacity threshold in morning peak hour. However, traffic volumes at this junction were still within its theoretical traffic carrying capacity in the morning peak hour.

It is worth noting that vehicles accessing the candidate site would utilise priority junction No.1 to join the R135 from the N2 and vehicles exiting the site would take a separate route to the N2 via junction No.2. The traffic signal junction No. 2 was found to operate well within the design traffic capacity threshold during both the morning and evening peak hours.

Traffic signal junction No. 1 (Kilshane Cross) however, is currently operating over the design traffic capacity threshold at morning and evening peak hour. The junction still operates within its theoretical traffic carrying capacity in the morning peak hour but not in the evening peak.

An overall comparative assessment of this site and the other potential sites is provided in section 10.3.1.

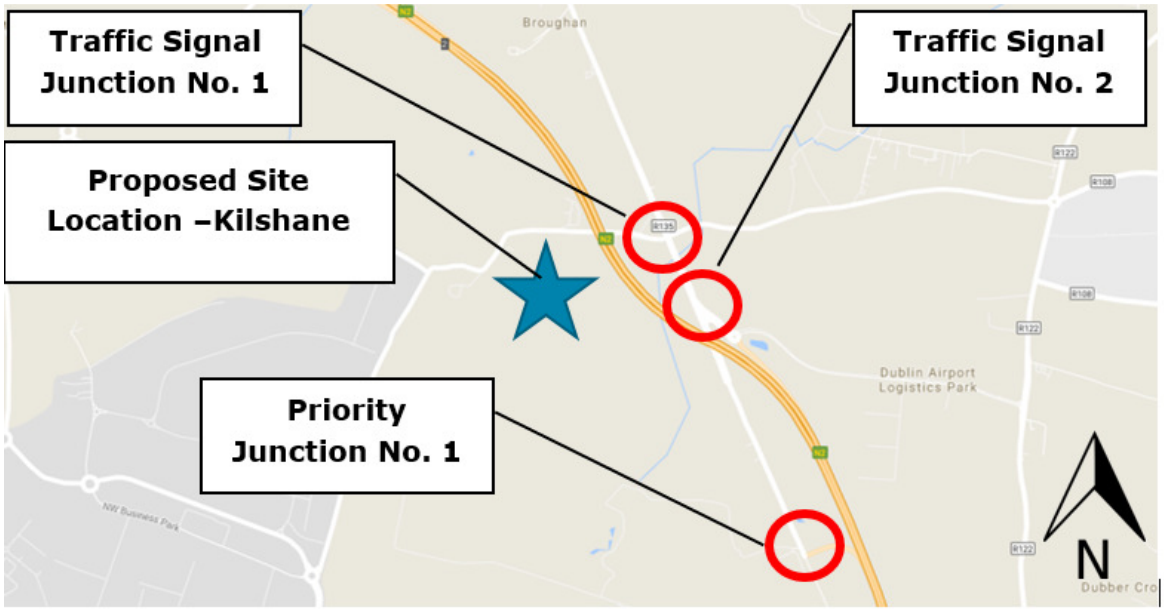

Figure 16 Key Junctions at Kilshane Site

9.3.2 Road Safety

A Road Safety Impact Assessment (RSIA) was undertaken by the assessment team. It was found that the negative safety aspects of the candidate site are as follows.

- There is limited visibility at potential site access location due to the L3120 vertical and horizontal geometry;
- The relatively steep gradients at site access are less suitable for HGVs;
- The proposed site entrance may impact on existing vehicle restraint barrier;
- HGVs exiting the site will be required to turn right onto L3120, thereby crossing a traffic lane;

- Forward visibility for vehicles approaching Kilshane Cross from site is inadequate;
- There is potential for HGVs travelling to candidate site to add to queuing lengths at the junction of the slip lane from the N2 and the R135;
- The interaction of proposed entrance with existing entrances may require a departure from standard due to proximity to other junctions.

An overall comparative assessment of this site and the other potential sites is provided in section 10.3.2.

9.3.3 Service & Utility Connections

The candidate site is currently undeveloped and no services are available on the site.

There are no wastewater or surface water sewers near the site and therefore, connections to sewers in the area is less feasible. A potential solution for wastewater flows generated by staff during operation of the RBSF would be onsite treatment with the treated effluent discharging, subject to local authority approval, to either a nearby watercourse or to groundwater.

An outfall point for surface water run-off to the tributary of the River Ward adjacent to the southern boundary would be required for the proposed RBSF. This would be limited to flows to replicate current greenfield run-off rates.

Potable water is available from a 50mm watermain in the L3120 road beside the site. However, fire water supply requirements will require consultation with the local authority and may involve connections to separate mains further from the site.

Electricity supply and telecommunications is available adjacent to the candidate site.

9.3.4 Geotechnical

The candidate site is underlain by limestone at a depth of 1 to 5m. The overburden above this comprises tills derived chiefly from limestone beneath. It is estimated that an average of 0.8m of fill over the building and development site areas will be required in order to provide a level base for construction. There is no requirement for excavation of soft ground at this site. There is no requirement for rock excavation and there is no known karst.

9.3.5 Distance from Biosolids Sources

Haulage vehicles travelling to the candidate site from the biosolids sources will follow the M50 motorway. Vehicles from Ringsend WwTP will join the M50 at Junction 1 (Dublin Port Tunnel), while vehicles from the proposed GDD WwTP will join at Junction 3 near Clonshaugh. Vehicles will continue on the M50 to Junction 5 and then travel 1.3km along the N2 and will leave the N2 at a slip road leading to the R135. Once on the R135, they will travel 1.2km to Kilshane Cross and a further 450m on the L3120 to the candidate site. The overall transport distance from the source centre point, as defined in section 4.5.5, to the candidate site is 19km.

9.3.6 Capital & Operating Costs

An analysis of the percentage cost difference for the candidate site indicates a range of between 3% and 25% above the Base Cost. This increase results from greater fill levels being required over the site development area along with a watercourse diversion. Another factor which reduces site development costs is the proximity of the Huntstown Quarry which reduces direct construction costs and contract timeframes.

Transport costs in bringing biosolids to this candidate site during the operation of the facility are estimated to be 15% less than that of the site with the highest cost, namely Greenogue.

9.4 Planning

9.4.1 Land Use Zoning

The candidate site is considered in the context of the current *Fingal County Council Development Plan 2017 – 2023*, which is the statutory land-use plan governing the candidate site. The candidate site does not form part of a Local Area Plan. The site is currently zoned under the plan as *HI - Provide for heavy industry.*

Under 'HI' zoning category noted in the development plan a Waste Disposal and Recovery Facility (High Impact) is a use which is 'permitted in principle'. The Development Plan states that 'HI' zoned land shall "facilitate opportunities for industrial uses, activities and processes which may give rise to land use conflict if located within other zonings. Such uses, activities and processes would be likely to produce adverse impacts, for example by way of noise, dust or visual impacts. HI areas provide suitable and accessible locations specifically for heavy industry and shall be reserved solely for such uses."

9.4.2 Planning Policies & Objectives

Under the *Fingal County Council Development Plan 2017 – 2023*, it is noted that the candidate site is within the 'Nature Development Area'. The plan describes Nature Development Areas as reservoirs of biodiversity in the wider countryside and together with the corridors and stepping stones allow species to move through the landscape. Objective NH20 of the development plan outlines the local authority's intention to maintain and/or enhance the biodiversity of the Nature Development Areas.

Huntstown power station, located 300m to the south of the candidate site, is classified as a lower tier Seveso III site under the Fingal County Council Development Plan 2017 – 2023. The Power Station was granted planning permission under F98A/1313.

The *Fingal County Development Plan 2017 – 2023* includes objectives in relation to development near Dublin Airport. The plan's objectives outline commitments to the promotion of appropriate land use patterns in the vicinity of the flight paths. It states that the Council will take into account relevant publications issued by the Irish Aviation Authority in respect of the operations of and development in and around Dublin Airport and will take account of the advice of the Irish Aviation Authority with regard to the effects of any development proposals on the safety of aircraft or the safe and efficient navigation thereof.

The Development Plan shows the Public Safety Zones and Noise Zones for Dublin Airport. The candidate site is located within the Dublin Airport Inner Noise Zone and the Outer Public Safety Zone. A large portion of the candidate site is within the Dublin Airport Red Approach Zone and therefore, detailed analysis will need to be conducted in order to ensure that no proposed object will penetrate the 'Obstacle Limitation Surface', as defined in the IAA advisory memorandum and ICAO documentation.

9.4.3 Planning History & Current Usage

A review of the Fingal County Council planning database shows no planning history at the candidate site. The land is currently utilised for agricultural purposes and a review of historic maps, both 6-inch and 25-inch, indicate the site has not been subject to a previous development.

9.4.4 Population & Sensitive Receptors

The estimated population within 100m, 250m and 500m of the boundary of the candidate site is summarised in Table 14 below.

Table 14 Estimated Population near Kilshane site

Distance from Site Boundary	***Estimated Population***
100m	8
250m	27
500m	43

There are no hospitals or nursing homes near the candidate site.

Submissions were made during consultation which referenced the proximity of three schools to the candidate site. The nearest school is St. Margaret's National School, which is 2km northeast of the candidate site.

9.4.5 Adjacent Land Use

Huntstown Quarry, located to the southwest of the candidate site, has been subject to several planning applications and the following permissions are related to lands directly adjacent to the candidate site:

- FCC Reg. Ref. 93A/1134 (1993): Permission was sought by Roadstone Dublin Limited to retain indefinitely all existing plant buildings services & ancillary development (including concrete plant,

macadam plant, stone plant & block plant) as previously approved in 1984 (Reg. Ref. WA/2282) & for permission to quarry northern, western and central limestone deposit as approved Reg. Ref. WA/2282 and southern deposit at their 200-hectare Huntstown quarry. Fingal County Council granted permission in December 1993.

- FCC Reg. Ref. FW16A/0120 (2016): Permission sought by Roadstone Ltd. for development comprising an increase in the rate of importation of inert soil and stone waste used in the restoration of quarry voids (and backfilling to former ground level), from the current maximum of 750,000 tonnes per annum. Fingal County Council granted permission in October 2016.

9.5 Social and Community

9.5.1 Material Assets

The candidate site is undeveloped grassland, which is located approximately 2.3km to the northwest of the M50 motorway. The site is set within an industrial area with some sparse areas of residential housing situated predominantly in an industrial setting of the townlands of Killshane. The larger population areas are to the south of site, south of the M50 motorway.

The site itself is accessed from the R135 regional road via Coldwinters slip road from the N2 National primary road, both of which are designed to accommodate HGV traffic.

Huntstown Quarry adjoins the site to the south. The Huntstown Quarry adjacent to the site would have quarry assets which potentially extend into the candidate site. The quarry is designated as a County Geological Site (CGS) and may be recommended for geological Natural Heritage Area as the quarry demonstrates the base of the Tober Colleen Formation where it directly overlies Waulsortian. The site has no previous historical use that may result in the presence of contaminated ground.

Dublin Airport is located 1.5km to the east of the candidate site and site is situated within the safeguarding zones of the airport. There are no schools, hospitals or other amenities located within 1km of the candidate site.

A review of the Archaeology, Cultural & Architectural Heritage, refer to section 9.2.8 above, established that there are no recorded monuments within the site candidate. However, there is a levelled recorded monument (Castle - motte and bailey, DU014-013) situated to the south of the site.

There are no SPAs or SACs located within or adjacent to the candidate site. The River Ward and its catchment area, within which the site is located, discharges to the Malahide Estuary SAC (000205) and Broadmeadow/Swords Estuary SPA (004025) approximately 12km downstream. South Dublin Bay cSAC (000210), Rye Water Valley/Carton SAC (001398), Malahide Estuary SAC (000205), North Dublin Bay cSAC (000206), Howth Head cSAC (000202), South Dublin Bay and River Tolka Estuary SPA (004024), North Bull Island SPA (004006), Baldoyle Bay SPA (004016), Broadmeadow/Swords Estuary SPA (004025) and Rogerstown Estuary SPA (004015) are within 15km of the site.

There are no public wastewater or surface water sewers near the site. Therefore wastewater flows generated by staff during operation of the RBSF would need to be treated onsite and effluent discharged to either a nearby watercourse or to groundwater.

An outfall for surface water run-off to the tributary of the River Ward adjacent to the southern boundary would be required for the proposed RBSF.

A 110kV ESB overhead transmission line runs parallel and within 15m of the southern boundary of the candidate site. A 38kV overhead electricity line passes across the southeast corner of the site.

A 75mm watermain is located in the adjacent local road to the north of the candidate site. A new 1000mm watermain from Ballycoolen to Kingstown is planned and will pass close to the southeast corner of the site.

9.5.2 Neighbourhood Character

The site is located within an area characterised by mixed commercial and industrial activity with limited residential development. There is a large commercial and industrial area further to the west of the site in the area of Ballycoolin. The Airport Logistics Park, a smaller development, is on the other site of the N2 road to the east of the site. The nearest larger populated areas are located south of the M50 motorway.

10.0 Preferred Site Selection

10.1 Introduction

The purpose of this Report is to identify the preferred site for the proposed RBSF and to outline the methodology that has been adopted to identify it.

The Stage 3 site selection process involved a review of consultation feedback received during the Stage 2 consultation period, which followed the publication of *the Stage 2 Report – Identification of Potential Sites*. That report identified the five potential sites which would undergo further assessment at Stage 3. The proposed site selection methodology for Stage 3 was also set out in the report.

The Stage 2 feedback was incorporated in the site selection methodology where appropriate, and the Stage 3 criteria were adapted if necessary. The assessments and studies, associated with each criterion were carried out by relevant specialists. The assessment methodology for each criterion is described in Section 4.0 of this Report. The findings of each assessment are provided in section 5.0 to 9.0 of this Report with a section dedicated to each potential site.

As described in section 4.0, the overall assessment of the potential sites for the RBSF and the selection of the preferred site is based on advantages and disadvantages of the potential sites in relation to each other in accordance with the environmental and technical criteria. This comparative assessment allocates either *More Favourable*, *Less Favourable* or *Neutral* classifications to each site for the individual criterion identified. For each of the criteria, a qualitative approach was adopted in determining classifications. The selection of the final preferred site is based on a cumulative consideration of the classifications.

10.2 Environmental Comparative Assessment

10.2.1 Air Quality

The Kilshane site is deemed to be the least constrained site based on it having the least number of air quality sensitive properties located within 50m of the site boundary. However, there is only a small margin between this site and the other sites. The overall impact for all sites is considered to be a minor negative impact with no mitigation measures in place. Once consideration has been given to standard good practice measures to control dust emissions during the construction phase it is possible for the development to have no significant air quality impacts.

In conclusion, no significant difference between the potential sites has been determined in the assessment and therefore, all sites are classified as Neutral.

10.2.2 Odour

Submissions were received during consultation in relation to concerns about the potential odour generated at the facility. Odour control measures will be designed and fully implemented at the proposed RBSF to avoid any odour nuisance to nearby receptors. Nevertheless, a comparative assessment was undertaken for the Stage 3 site selection process to determine if a more favourable site could be identified from the five potential sites.

A qualitative odour assessment considered baseline odour conditions at each location, potential emission from the RBSF, receptor proximity, receptor sensitivity, and analysis of representative meteorological data.

As baseline odour conditions were assumed to be negligible for all five potential sites and the RBSF facility will be a fixed design, comparison of the site options was made by evaluation of receptor and meteorological conditions.

The assessment determined that, in relation to the risk of potential odour impacts, the Bracetown/Gunnocks, Gunnocks and Greenogue sites to be the least favoured sites. The less favoured sites were considered to have more sensitive receptors or have a high percentage of hours where receptors were downwind of the potential RBSF site.

The Newtown/Kilshane and the Kilshane sites were considered to have a reduced risk of odour impacts compared to the other potential sites. Since neither site was deemed more preferable, the sites are both classifies as Neutral.

10.2.3 Noise

Submissions were received during consultation in relation to concerns about the noise generated at the facility. The operational noise levels at the RBSF will be limited in accordance with the most appropriate guidance for a development of this type. Nevertheless, a comparative assessment was undertaken for the Stage 3 site selection process to determine if a more favourable site could be identified from the five potential sites.

Of the five potential sites, it has been determined that the development of the RBSF at the Greenogue site has the potential to have most impact in terms of noise. Applying the comparative Potential Impact Rating (PIR) as per TII guidelines, which is based on the proximity and quantity of receptors in the vicinity of the site, the Greenogue site ranks highest. Bracetown/Gunnocks and Kilshane sites were considered to have a lower potential impact based. Gunnocks and Newtown/Kilshane were considered to have the least potential impact based on the PIR.

In addition to the PIR, the relative sensitivity of the receiving noise environment for the potential sites was considered. The Dublin Agglomeration noise mapping demonstrates that receptors located in the vicinity of Greenogue, Newtown/Kilshane and Kilshane are exposed to high levels of road traffic noise. The Meath County Council noise mapping shows that the Bracetown/Gunnocks and Gunnocks sites are exposed to a lower noise level at night time.

Having considered both the PIR and sensitivity of the receiving noise environment, the Newtown/Kilshane site is determined to be More Favourable in terms of the comparative classification. This is based on the site having the least potential impact on receptors and the receiving noise environment being less sensitive than the site at Gunnocks, which has the same PIR. The Bracetown/Gunnocks, Gunnocks and Kilshane sites are classified as Neutral and the Greenogue site is classified as Less Favourable.

10.2.4 Landscape & Visual

The site at Gunnocks is within a landscape of greater sensitivity and higher value and development is likely to require substantial disturbance of existing tree-lined hedgerows and will be quite exposed from the R147 overpass and from the south, including from Gunnocks House.

The site at Kilshane is also of higher value and development likely to require significant grading of the terrain and disturbance of tree-lined hedgerows, leaving it more exposed to the Kilshane L3120 road and also to the N2 from where development would be seen against the skyline.

As such, Gunnocks and Kilshane are least favoured.

The sites at Bracetown/Gunnocks, Greenogue and Newtown/Kilshane lie within a landscape context or have site characteristics that afford a higher absorption capacity where impacts will be more localised and can be mitigated.

The sites at Bracetown/Gunnocks and Greenogue are adjacent to a number of residential properties and Bracetown/Gunnocks is also adjacent to commercial office space. As such these sites are considered Neutral.

Newtown/Kilshane is preferred as it provides an existing industrial and infrastructural setting for both the immediate locality of the site and also as a backdrop when viewed from the elevated section of the N2 to the east. Newtown/Kilshane also presents a good opportunity for incorporation of landscape measures for mitigation.

10.2.5 Geology & Hydrogeology

From a soils, geology and hydrogeology perspective, there is very little interaction between the proposed RBSF and the environments of each of the potential sites. The principal difference between the sites is aquifer vulnerability. Based on site investigation information at the Newtown/Kilshane site, it was determined that aquifer (groundwater) vulnerability is less here than at the other sites. However, the risk of event due to

activities at the proposed RBSF that might impact groundwater is minor. Overall, no site emerged as more favourable than the others and therefore all sites are classified as Neutral.

10.2.6 Hydrology

The Greenogue site is classified as Less Favourable than the other potential sites as there is a potential impact on the flood storage area for the River Griffeen tributary, which runs through the centre of the site.

There is no foreseeable flood risk at the Bracetown/Gunnocks and Gunnocks sites following the development of the type proposed. There are also two potential surface water discharge points to either the Pace Stream or River Tolka. The discharge to River Tolka at either site, however, will require a more complex engineering solution. Discharge to either of these watercourses is not expected to contribute to upstream or downstream flooding. The sites are classified as Neutral.

There is no foreseeable flood risk at either Newtown/Kilshane or Kilshane following the development of the type proposed. Suitable surface water discharge points are available to the River Ward which are not expected to contribute to upstream or downstream flooding. Newtown/Kilshane and Kilshane are therefore classified as More Favourable.

10.2.7 Ecology

The assessment of the habitats present confirms that each of the sites is of local biodiversity value only. All the habitats are common and widespread and none is listed for protection in the EU Habitats Directive. All of the sites drain to river catchments that hold salmonids and all of these rivers discharge into Natura 2000 sites at the coast.

As there was no survey access it was not possible to undertake detailed surveys of habitats, flora, birds or mammals. However, a comparative evaluation of the potential of habitats present for various fauna groups was undertaken using remote methods. In intensive farmland landscapes treelines and hedgerows tend to have the highest biodiversity. In particular, mature treelines form a network across open countryside providing breeding and roosting sites for birds, bats and cover for larger mammals such as badger, otter and deer species. As perimeter treelines were considered unlikely to be impacted by the proposed development, internal mature treelines were considered in the comparative assessment. This allows the categorisation of the sites as more favourable or less favourable.

There are no internal mature treelines at the Newtown/Kilshane site and on this basis, the site is classified as More Favourable. The Gunnocks site is classified as Less Favourable as it contains 800m of internal mature treelines. Bracetown/Gunnocks, Greenogue and Kilshane contain between 200m and 400m of mature treelines and therefore, these are classified as Neutral.

10.2.8 Archaeology, Cultural & Architectural Heritage

The Archaeology, Cultural & Architectural Heritage assessment concluded that none of the potential sites contain known archaeology, cultural or architectural heritage.

An assessment of known cultural heritage and the potential for the presence of subsurface archaeological heritage in the immediate vicinity of the sites showed a possibility for archaeological artefacts or remains at Gunnocks, Greenogue and Kilshane sites. For this reason, the sites are classified as Less Favourable.

At the potential sites at Bracetown/Gunnocks and Newtown/Kilshane, no archaeological remains or artefacts are known to exist. Test excavations and onsite archaeological monitoring has been carried out at the Newtown/Kilshane site and no archaeological artefacts or remains were found. There is no record of investigations at Bracetown/Gunnocks. Therefore, Newtown/Kilshane represents the lowest potential for archaeology. For these reasons, Bracetown/Gunnocks is classified as Neutral and Newtown/Kilshane is classified as More Favourable.

10.3 Economic & Engineering

10.3.1 Traffic

Submissions were received during consultation in relation to concerns about additional traffic generated at the facility and its impact on roads in the area of the potential sites. In response to this feedback, traffic counts were carried out at the five sites over the course of a day. The traffic counts took place at eight separate

junctions on the 1st June 2017. The counts were used to support observations by traffic engineers of traffic patterns at the sites, which were carried out during a number of visits.

Through the assessment it was determined that the Greenogue and Kilshane sites were the least favoured in terms of traffic. It was found that the additional traffic from the proposed RBSF would have a negligible impact on the existing volumes on the link roads at all potential sites. However, at Greenogue the R120 is already operating significantly beyond its theoretical capacity and the L3120 at Kilshane is operating very close to its theoretical capacity. In addition, there are junctions near both sites that are operating very close and, in some cases, beyond their theoretical capacities. Furthermore, access to the Kilshane site would be the most difficult of the five potential sites.

It was determined that the proposed sites at Bracetown/Gunnocks, Gunnocks and Newtown/Kilshane performed equally well overall with only marginal variations in terms of capacity on link roads and nearby junctions. The capacity of the priority junction to the south of the Newtown/Kilshane site is close to its theoretical capacity. However, there is an advantage at Newtown/Kilshane in that only half of the additional traffic generated at the proposed site would come through this junction. Furthermore, it is expected that a junction layout could be designed to alleviate the capacity should it be required following further detailed assessments. Bracetown/Gunnocks, Gunnocks and Newtown/Kilshane sites are therefore, classified as Neutral.

10.3.2 Road Safety

A Road Safety Impact Assessment (RSIA) was undertaken in the assessment of the sites by qualified traffic engineers. The Road Safety Authority (RSA) database for road collisions was also referenced. When the aspects of each site were compared with one another it was determined that Newtown/Kilshane is More Favourable. Overall, the option for vehicles to turn left when both entering and exiting the candidate site is a significant advantage. While there is a potential to affect the queuing length at the junction where traffic from the N2 slip road meets the R135, it is expected that road layout solutions can be engineered at this junction.

Kilshane is classified as Less Favourable from a road safety perspective due to a number of factors. The main factor is the shorter visibility distances when exiting the candidate site.

The sites at Bracetown/Gunnocks, Gunnocks and Greenogue, where visibility at the proposed entrances is better than Kilshane, ranked in between the above-mentioned sites. The differences between the three were marginal and are therefore, classified as Neutral.

Submissions were received during consultation in relation to concerns about traffic safety and it was suggested collision data should be reviewed as part of the site selection process. As part of the road safety assessment, the Road Safety Authority (RSA) database for road collisions was reviewed. No significant difference or particular patterns were identified at the potential sites that that would suggest that any one of the sites was more favourable or less favourable in terms of collision statistics.

10.3.3 Service & Utility Connections

The assessment of services and utility connections near the potential sites concluded that all sites can be provided with drainage, power, telecommunications and water supply. The primary factor differentiating the sites is the degree of complexity for providing services and outfalls to the potential sites. ESB and telecommunications are available at each of the potential sites.

The Bracetown/Gunnocks, Kilshane and Gunnocks sites are deemed as Less Favourable due to the complexity in providing wastewater drainage and water supply. The Greenogue site is classified as Neutral as services are available relatively close to the candidate site. The site at Newtown/Kilshane is partially constructed with drainage, power, watermains and telecommunications infrastructure already in place. On this basis, the site is classified as More Favourable.

10.3.4 Geotechnical

The comparative assessment showed that Bracetown/Gunnocks, Gunnocks, Greenogue, Newtown/Kilshane and Kilshane sites as equal in terms of geotechnical considerations. Analysis of information from a past site investigation on the Newtown/Kilshane site identified soft ground in the upper levels of the site, which may require removal if it has not already been removed. On this basis, Bracetown/Gunnocks, Gunnocks, Greenogue, and Kilshane are classified as Neutral and Newtown/Kilshane is classified as Less Favourable.

10.3.5 Distance from Biosolids Sources

Haulage vehicles travelling to any of the candidate sites from the biosolids sources will follow the M50 motorway. Bracetown/Gunnocks, Gunnocks, and Greenogue candidate sites are between 29km and 32km from the biosolids source centre point and are classified as Neutral for the comparative assessment. Newtown/Kilshane and Kilshane are 18km and 19km from the source centre point respectively, and are therefore, classified as More Favourable.

10.3.6 Capital & Operating Costs

The outcome of the assessment of capital and operating costs shows that the Bracetown/Gunnocks, Gunnocks, Greenogue and Kilshane sites would be the more costly sites to develop. The Gunnocks site is expected to be the most costly of the five potential sites due to the additional requirement for earthworks at that site. On the basis that much of the existing infrastructure can be incorporated in the proposed RBSF development, the Newtown/Kilshane site will be the least expensive site to develop.

The differentiating factor in terms of operating costs was determined to be transport costs. This means that the site furthest from the biosolids sources would result in the highest operating cost. Greenogue was assessed to be the most costly. While this element of operating cost was not deemed significant in the overall context of operation, it was found that the sites at Bracetown/Gunnocks and Gunnocks would incur 10% less transport costs and the sites at Newtown/Kilshane and Kilshane would incur 15% less.

Overall, the Gunnocks site is classified Less Favourable. Bracetown/Gunnocks, Greenogue and Kilshane are classified as Neutral and the Newtown/Kilshane site is classified as More Favourable.

10.4 Planning

10.4.1 Land Use Zoning

A review of land zoning in the County Development Plans relevant to each site shows that the potential sites for the proposed RBSF are in areas that are generally suitable for the development.

The Bracetown/Gunnocks and Gunnocks sites are in an area zoned “General Enterprise & Employment” and "Warehousing & Distribution”. It is stated in the Meath County Council Development Plan that Waste Recycling/Transfer/Sorting Centre is a use open for consideration under these land use zonings.

The Greenogue site is in an area zoned “Enterprise and Employment”. The South Dublin County Council Development Plan includes a definition for a Refuse Transfer Station that is similar to the proposed RBSF and states that Refuse Transfer Station is permitted in principle under this zoning.

Newtown/Kilshane and Kilshane the Fingal County Development Plan shows that these sites are in areas zoned for heavy industry (‘HI’) and the plan refers to Waste Disposal and Recovery Facilities as being permitted in principle under this zoning.

Since developments that are closely aligned to the proposed RBSF are defined and permitted in principle in the development plans for South Dublin County Council and Fingal County Council, the sites at Greenogue, Newtown/Kilshane and Kilshane are classified as More Favourable. The sites at Bracetown/Gunnocks and Gunnocks are classified as Neutral.

10.4.2 Planning Policies & Objectives

On review of the planning policies and objectives it was determined that the Bracetown/Gunnocks and Gunnocks sites are less favoured because there is emphasis in the Development Plan to promote employment. The relatively low employment levels offered by the proposed RBSF may not be consistent with certain policies set out in the Meath County Council Development Plan.

The Greenogue and Kilshane sites may present challenges in their design due to their proximity to the safeguarding zones of Casement Aerodrome and Dublin Airport respectively. Due to their location within particular zones relevant to each airport there will be requirement for consultation with the relevant authorities with regard to potential restrictions on the proposed development.

The Newtown/Kilshane site is deemed to be the more favourable site on the basis that the proposed RBSF aligns with local objective 78 Fingal County Development Plan 2017-2023 which states “Facilitates the

development of infrastructure for waste management, including construction and demolition waste processing, biological treatment of organic waste, a sludge treatment facility and a waste transfer station." The site is within Dublin Airport's Outer Noise Zone but no other safeguarding zones. Consultation will be required with the relevant authorities but the potential restrictions due to aviation requirements are considered less likely than the above-mentioned sites.

Based on the assessment the Newtown/Kilshane site is classified as More Favourable, the Greenogue and Kilshane sites are classified as Neutral and the Bracetown/Gunnocks and Gunnocks sites are classified as Less Favourable.

10.4.3 Planning History & Current Usage

A review of the planning history of the sites at Bracetown/Gunnocks, Gunnocks, Greenogue or Kilshane reveals that there are no applications, historic or live, pertaining to the sites. Therefore, no impediments based on previous uses are expected. The sites are currently greenfield sites, leaving a planning application for the proposed RBSF to be assessed on its individual merits.

However, the Newtown/Kilshane site is deemed more favourable because planning permission has been granted at the site for a wastewater sludge hub, a construction and demolition waste facility, waste transfer facility and a composting facility and the site has been since been partially developed. It is expected that the existing infrastructure on the site can be adapted for the proposed RBSF. For this reason, Newtown/Kilshane is classified as More Favourable and the others are classified as Neutral.

10.4.4 Population & Sensitive Receptors

In the analysis of population near the five potential sites, population levels within 100m, 250m, and 500m of the site boundaries were considered. There was very little variation between the sites when population was considered within the 100m band. The estimated numbers varied between 5 and 11. Within the 250m band, where numbers varied between 8 and 49, the highest population was found at the Greenogue site and the lowest at the Gunnocks site. The trend was similar within the 500m band, with the highest population estimated for the Greenogue site (108) and the lowest at Gunnocks (11).

There are no hospitals near any of the potential sites. The nearest nursing home to the potential sites was found to be over 1km away from the Gunnocks site.

The nearest schools to the potential sites are 600m from the Greenogue site and 800m from the Gunnocks site. In both cases the schools are located within urban areas of nearby towns and are separated from the potential sites by busy national roads. At the Greenogue site there is childcare facility located 285m to the northwest.

Given the larger population at the Greenogue site and that a childcare facility is located nearby, the Greenogue site was classified as Less Favourable. There is no significant variance between the other four sites and therefore, these are classified as Neutral.

10.4.5 Adjacent Land Use

The adjacent land use is similar at the Bracetown/Gunnocks, Gunnocks and Greenogue sites. Planning permissions that have been granted beside all three sites have been generally for a mix of commercial, light industry and warehousing development.

At the Newtown/Kilshane and Kilshane sites, the planning history of adjoining sites includes a large scale quarry and a power plant and the sites are located in an area that has an established heavy industry use. There is a site located immediately east of the Newtown/Kilshane site, where an organisation for the homeless has been granted planning permission for a residential facility. The permission, granted in 2015 but not yet implemented, is for 6 houses and a community building. This permission was granted after the waste recycling facility permission and is contingent on drainage provision from development at the Newtown/Kilshane site.

On this assessment, the sites at Bracetown/Gunnocks, Gunnocks, Greenogue and Newtown/Kilshane are classified as Neutral and the site at Kilshane is classified as More Favourable.

10.5 Social and Community

10.5.1 Material Assets

This assessment did not identify potential effects on material assets in the environment of the Bracetown/Gunnocks, Gunnocks, Greenogue and Newtown/Kilshane that were significant or that would differentiate them in terms of selection. The site at Kilshane has the potential for the presence of quarriable minerals and is adjacent to an existing quarry. The proposed RBSF development has the potential to prevent future quarrying of the mineral asset.

Based on this assessment, the sites at Bracetown/Gunnocks, Gunnocks, Greenogue and Newtown/Kilshane are classified as Neutral and the site at Kilshane is classified as Less Favourable.

10.5.2 Neighbourhood Character

In terms of neighbourhood character, it is notable that all five sites are within land that has been zoned for potential industrial use. While the Greenogue site, could be classified as the least rural of the five sites due to its proximity to Newcastle, Rathcoole and a large business park, all sites are relatively close to existing commercial and industrial areas of varying intensities.

As noted in the other assessments described in this Report, there are a relatively small number of residential properties very close to the sites. Further from the sites, 300m in some cases, there are clusters of housing with 10 to 15 properties. As shown in the Population & Sensitive Receptors sections of the Report, the largest population within 250m of any site is approximately 49, which is at Greenogue. This equates to approximately 18 properties. However, it appears that more recently, the business park has developed in this neighbourhood around the residential properties. The larger and more densely populated neighbourhoods are within the villages and towns, which are located between 750m and 2km from the sites.

Overall, no differentiating factor was identified that would classify any of the sites more favourable or less favourable. Therefore, all sites are classified as Neutral.

10.6 Selection of Preferred Site

A summary of the comparative assessment described in the previous sections for each of the criteria is illustrated in the matrix below.

Table 15 Comparative Assessment Summary

Criteria / *Site*		Bracetown/ Gunnocks	Gunnocks	Greenogue	Newtown/ Kilshane	Kilshane
Environmental	Air Quality	●	●	●	●	●
	Odour	▼	▼	▼	●	●
	Noise	●	●	▼	▲	●
	Landscape & Visual	●	▼	●	▲	▼
	Geology & Hydrogeology	●	●	●	●	●
	Hydrology	●	●	▼	▲	▲
	Ecology	●	▼	●	▲	●
	Archaeology, Cultural & Architectural Heritage	●	▼	▼	▲	▼
Economic & Engineering	Traffic	●	●	▼	●	▼
	Road Safety	●	●	●	▲	▼
	Service & Utility Connections	▼	▼	●	▲	▼
	Geotechnical	●	●	●	▼	●
	Distance from Biosolids Source	●	●	●	▲	▲
	Capital & Operating Costs	●	▼	●	▲	●
Planning	Land Use Zoning	●	●	▲	▲	▲
	Planning Policies & Objectives	▼	▼	●	▲	●
	Planning History & Current Usage	●	●	●	▲	●
	Population & Sensitive Receptors	●	●	▼	●	●
	Adjacent Land Use	●	●	●	●	▲
Social & Community	Material Assets	●	●	●	●	▼
	Neighbourhood Character	●	●	●	●	●

Legend: ▲ **More Favourable** ● **Neutral** ▼ **Less Favourable**

A qualitative comparative assessment of the five potential sites under the criteria explained throughout this Report has concluded that the Newtown/Kilshane site is the preferred site for the proposed Regional Biosolids Storage Facility.

The Newtown/Kilshane site was determined to be More Favourable for a number of criteria assessed. The main advantages of the Newtown/Kilshane site are summarised below.

- The proposed development would be considered as Permitted in Principle in the Fingal County Development Plan.
- The site has been partially developed for what was intended to be a waste recycling facility. The planned activities included recovery of construction and demolition waste, wastewater sludge treatment, biological waste treatment and waste transfer for municipal waste.
- There are existing roads, site services and fencing from this past development that can be incorporated into the proposed development of the RBSF.
- The opportunity for vehicles to turn left, rather than cross traffic, when entering and exiting the site is a positive aspect in terms of road safety. Visibility at the entrance is more than adequate and traffic volumes on the R135 outside the site are low.
- The additional traffic from the proposed RBSF is expected to have minimal impact on the R135 and the junctions to the north of the site. However, the junction to the south, where the slip road from the N2 meets the R135, requires further investigation regarding its impact on traffic movements at this location.
- The site is located in an existing industrial and infrastructural setting. The Huntstown Quarry and Electricity Power Station are located to the west and southwest of the site. This is the landscape backdrop when the site is viewed from the elevated section of the N2 to the east. The site presents a good opportunity for incorporation of landscape measures for mitigation.
- The population within 500m of the site is estimated to be less than 30 and the nearest schools are more than 2km to the east of the site. There are no hospitals near the site.

It is proposed to develop the design of the proposed RBSF in further detail and to carry out the necessary environmental studies in relation to the development at Newtown/Kilshane in preparation of an EIAR. The EIAR and proposed design will be submitted in conjunction with the planning application for both Ringsend Wastewater Treatment Plant and Greater Dublin Drainage project.

11.0 Next Steps

A site at Newtown/Kilshane in Dublin 11 has been identified as the preferred site. The preferred site will now undergo further environmental studies and assessments as part of the preparation of a planning application for the project. To inform these assessments, a scoping report for the Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) has been published and Irish Water is seeking feedback on these reports.

The scoping report is a key element of the EIA process and signifies commencement of the development of an Environmental Impact Assessment Report (EIAR). 'Scoping' is the process of deciding what information should be contained in an EIAR and what methods should be used to gather and assess that information. Following the publication of the scoping report, consultation with the public and key stakeholders will continue. Consultation will allow for input from the interested parties and aid in identifying areas which may require further scrutiny during the preparation of the EIAR.

Following the completion of the necessary environmental studies and assessments in preparation of the EIAR, planning permission for the Regional Biosolids Storage Facility will be sought as part of the applications for both the upgrade of the Ringsend Wastewater Treatment Plant and the proposed new regional wastewater treatment facility for north Dublin (the Greater Dublin Drainage project). Irish Water intends to lodge planning applications for these projects to An Bord Pleanála within the next 12 months. An Bord Pleanála will hold a full statutory consultation before making a final decision.

Stage 3 Public Consultation

The *Stage 3 Report – Identification of Preferred Site* and the scoping report for the EIAR and NIS have been published and a six week consultation is being held from 29 August 2017 to 10 October 2017.

Irish Water is seeking feedback on the following:

- Is there any additional information on the preferred site at Newtown/Kilshane that we should be aware of?
- What do you think of the indicative layout of the preferred site, as outlined in the Stage 3 Report?
- The proposed methodology for the assessment of environmental impacts is set out in the scoping report of the EIAR and NIS. Are there any other factors that you think should be considered in assessing the environmental impact of the project?
- How would you like Irish Water to communicate with you as the project progresses?

The *Stage 3 Report – Identification of Preferred Site* and the scoping report for the EIAR and NIS can be viewed on the project website at www.water.ie/ biosolids/. Hard copies are available for viewing at Irish Water's offices at Colvill House, Dublin 1 and at planning counters and county libraries in Fingal, South Dublin, Dublin City, Dún Laoghaire-Rathdown, Kildare, Meath and Wicklow.

Submissions or observations on the project are invited:

- By phone: 1890 44 55 67
- By email: biosolids@water.ie
- By post: Biosolids Consultation, Irish Water, Colvill House, 24-26 Talbot Street, Dublin 1, Ireland.

To facilitate participation in the consultation, Irish Water is holding a public information event where the project team will be available to meet with the public and all interested stakeholders as follows:

- Date: Tuesday 12 September 2017
- Venue: The White House Hotel, Newpark, Co. Dublin, from 1pm-8pm

The information event will provide an opportunity to have your say on the project and to get further information about the Regional Biosolids Storage Facility.

Appendices

Appendix A Stage 2 Consultation Report

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1 BACKGROUND

1.1 INTRODUCTION

Irish Water is carrying out a site selection process to find a location for a Regional Biosolids Storage Facility (RBSF) to serve greater Dublin. The selected site and proposed facility will be included in the planning application for the upgrade to the Ringsend Wastewater Treatment Plant (WwTP). The RBSF will also be included in the planning application for the proposed Greater Dublin Drainage (GDD) project comprising the development of a regional WwTP in Clonshaugh in north Dublin. Both of these planning applications will be submitted to An Bord Pleanála for approval.

The treatment of the wastewater generated in greater Dublin by homes, schools, businesses and industry produces sludge. Wastewater sludge is made up mainly of organic matter that has been removed from the treated water during the treatment process. Further treatment of this sludge is required to enable its safe and efficient re-use or disposal. The further processing of the sludge results in 'biosolids', a biologically stable product free of harmful pathogens (viruses, bacteria etc.) and containing high levels of plant nutrients, e.g. nitrogen and phosphorus. This treatment of sludge happens before the sludge is transported to a biosolids storage facility. Most of the biosolids produced in Ireland (98%) is currently reused on agricultural lands as a soil conditioner and as a replacement for chemical fertilisers. The use of biosolids on agriculture lands is strictly regulated under European and National law. One of the conditions of use is a strict prohibition on spreading biosolids on land over the winter period (October to January). This restriction means that biosolids reused in agriculture need to be stored for certain periods over each calendar year. The need for a regional storage facility serving greater Dublin has been identified by Irish Water in the National Wastewater Sludge Management Plan published in October 2016. Further information on this plan and the public consultation undertaken can be found at https://www.water.ie/projects-plans/wastewater-sludge-management/.

There is no proposal to re-locate the spread lands to the same location as the proposed RBSF. Biosolids produced at the existing Ringsend WwTP will continue to be spread on lands in south Leinster. Biosolids will be stored at the RBSF at times of the year when land spreading is not taking place.

The proposed RBSF would have the capacity to store biosolids arising from the existing Ringsend WwTP, from the new GDD facility as and when required, and from other smaller WwTPs in the Dublin region. The new storage facility will serve greater Dublin and its population for the next 25 years and will safeguard public health, protect the environment and facilitate development in this growing region. The new regional facility will lead to greater efficiencies and more effective management of the wastewater treatment network.

1.1.1 Project Roadmap

This Project Roadmap in **Figure 1.1** below, sets out the steps planned to facilitate engagement by the public and all relevant stakeholders as we progress the project. This incorporates three rounds of non-statutory public consultation:

- Stage 1 Consultation on the study area and constraints;
- Stage 2 Consultation on a number of potentially suitable sites; and

- Stage 3 Consultation on the preferred location for a site and views on what should be considered as part of the EIA and NIS.

Following the completion of consultation on a preferred site, that site will be environmentally assessed as part of the EIA and NIS process and submitted with the planning applications for the upgrade of the Ringsend WwTP and the GDD project. This is to facilitate comprehensive solutions for both projects being presented to An Bord Pleanála for adjudication. An Bord Pleanála will undertake statutory consultation on both applications for planning approval as part of their overall assessment of these projects.

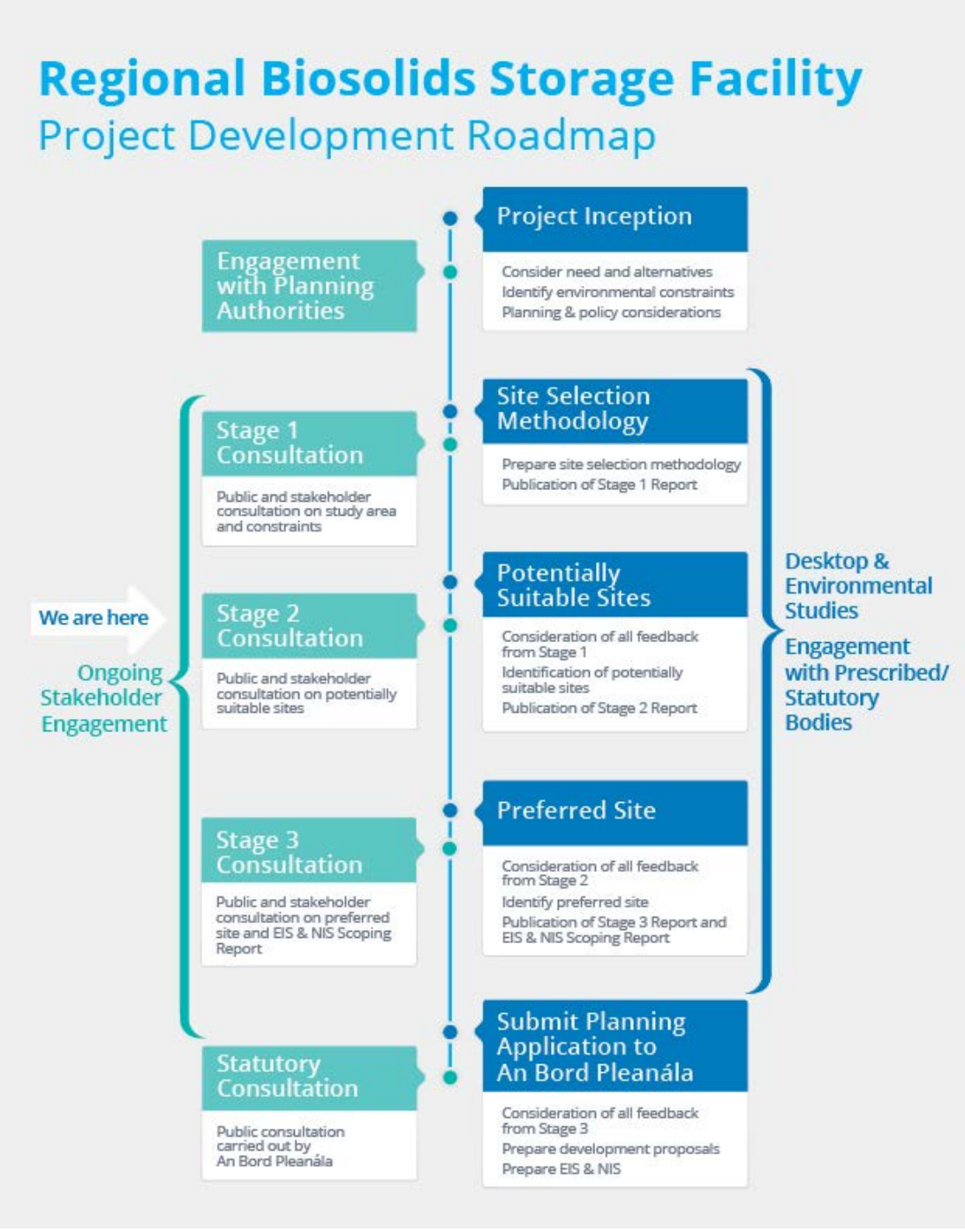


Figure 1-1: Regional Biosolids Storage Facility Roadmap: Stage 2 Consultation

1.1.2 Stage 1 Report – Site Selection Methodology

On 2nd February 2017, Irish Water published the Stage 1 Report – Site Selection Methodology for consultation. The purpose of the Stage 1 Report for the RBSF project was to:

- explain the need for the proposed RBSF;
- outline the study area for the proposed project;
- outline what such a facility would look like and how it would operate;
- outline the planning and other legislation that applies to the proposed development; and
- outline the project development roadmap and the process by which Irish Water is proposing to identify and develop a site for the facility.

Following publication of the Stage 1 Report on 2nd February 2017 Irish Water commenced a focussed period of non-statutory public consultation that ran for four weeks until 2nd March 2017. Throughout the consultation, Irish Water sought feedback from the public, local authorities, elected representatives and all interested individuals and organisations on the contents of the Stage 1 Report. All consultation activities undertaken are detailed below in the Stage 1 Consultation Report.

1.1.3 Stage 2 Report – Identification of Potential Sites

On 11th May 2017, Irish Water published the Stage 2 Report – Identification of Potential Sites for consultation. The purpose of the Stage 2 Report for the RBSF project was to:

- Demonstrate the process undertaken to identify a shortlist of potential sites for the project;
- Identify the five shortlisted potential sites;
- Provide a report on the consultation activity carried out at Stage 1 and how the feedback provided was considered by the project team;
- Outline the next steps of the project and how the team will identify a preferred site.

Following publication of the Stage 2 Report, a focussed period of non-statutory public consultation ran for five weeks until 15th June 2017. Throughout the consultation, Irish Water sought feedback from the public, local authorities, elected representatives and all interested individuals and organisations on the contents of the Stage 2 Report. All consultation activities undertaken are detailed in this consultation report.

This focused period of public consultation is part of a broader process of engagement in the development of the Regional Biosolids Storage Facility. Irish Water seeks to engage stakeholders on each of its projects in a transparent and proactive manner to ensure better outcomes for the parties involved. All stakeholder engagement activity carried out by Irish Water is in line with national and European legislation and international best practice.

1.1.4 Stage 2 Consultation Terms of Reference

The terms of reference of the consultation sought to gather feedback on the aspects of the Stage 2 Report that were of most significance to this phase of the project.

The terms of reference of the consultation asked stakeholders the following:

- What do you think of the five potential sites?
- Is there any additional information on the potential sites identified that we should be aware of?
- In addition to Environmental, Economic & Engineering, Planning and Social & Community criteria set out to select a preferred site, are there any other factors you think should be considered in choosing the preferred site?
- How would you like Irish Water to communicate with you as the project progresses?

1.2 STAGE 2 CONSULTATION

A range of communications tools were employed to publicise the focused period of public consultation on the Stage 2 Report, in order to generate awareness of the project and to facilitate participation in the project development process.

Key components of the focussed consultation process included:

- Publication of the Stage 2 Report – online and in hard copy at Irish Water's head office and at planning counters and county libraries throughout the project study area;
- Advertising in national and local press;
- Engagement through media and social media;
- A dedicated project webpage hosted on the Irish Water website;
- A newsletter providing an update on the project to date and the consultation being carried out;
- Three public open days to facilitate participation from stakeholders in the areas surrounding the five potential sites;
- Direct engagement with interested stakeholders and groups; public representatives; relevant bodies; and local authorities relevant to the study area;
- A dedicated project information service.

This section of the report provides further detail on each of the above consultation activities.

1.2.1 Publication of the Stage 2 Report

The Stage 2 Report was published on 11th May 2017 at the start of the focussed consultation period. The report was published on the project webpage within the Irish Water website and made available to download. Correspondence with all stakeholders during the consultation advised of the availability of the report online and in hard copy at the below locations.

Hard copies of the Report were available for the public to review at Irish Water's Colvill House offices on Talbot Street, Dublin 1.

Copies of the Stage 2 Report were also distributed to the seven local authorities within the project study area with each Council Planning Department contacted and requested to display same.

County libraries were also contacted in each local authority and a copy of the Stage 2 Report was provided to the seven county libraries in the study area for public display.

Table 1.1 below lists the libraries and planning counters issued with copies of the Stage 2 Report for display.

Local Authorities	Library	Planning Desk
Dublin City Council	Central Library, Dublin 1	Civic Offices, Dublin 8
Dun Laoghaire Rathdown County Council	DLR Lexicon, Dun Laoghaire	County Hall, Dun Laoghaire
Fingal County Council	Swords Library, Co. Dublin	County Hall, Swords
Kildare County Council	Kildare Library & Arts Service Headquarters, Riverbank Arts Centre, Newbridge	Devoy Park, Naas
Meath County Council	Meath County Library, Navan	Beuvinda House, Navan
South Dublin County Council	County Library, Tallaght	County Hall, Tallaght
Wicklow County Council	Wicklow County Library Headquarters, Bray	County Buildings, Wicklow Town

Table 1-1: Libraries & Planning Counters Issued the Stage 2 Report for Display

The availability of these documents at Irish Water offices and at each local authority's main planning counter and library was promoted through the project web page, in direct correspondence with stakeholders and in advertisements in national and local newspapers.

1.2.2 Advertising

A public consultation advertisement was placed in national publications – the Irish Independent and the Irish Farmers Journal – at the launch of the Stage 2 Consultation. A copy of the advertisement is included in **Appendix A1**.

The advertisement was also placed in a number of local newspapers across the project study area which are listed in **Table 1.2** below:

RBSF Advertisement - Media Organisations
Irish Farmers Journal
Irish Independent
Bray People
Dublin People (Northside and Southside)
Echo Newspapers
Fingal Independent
Kildare Nationalist
Leinster Leader
Liffey Champion
Meath Chronicle
North County Leader
The Gazette
Wicklow People
Wicklow Times

Table 1-2: List of Media Organisations where RBSF advertisement was published in May 2017

The advertisement announced the Stage 2 Consultation of the Regional Biosolids Storage Facility project and explained that Irish Water was consulting on five potential sites shortlisted for the project. Stakeholders were advised where the Stage 2 Report could be viewed, and how feedback on the project could be provided within the consultation time period. Contact details for the dedicated project phone line, the project email address, postal address and project website were provided.

1.2.3 Media & Social Media

News releases were issued to national media organisations and local media organisations throughout the project study area in counties Dublin, Kildare and Meath. Information was provided on the Regional Biosolids Storage Facility and the Stage 2 consultation. A copy of the news release issued to media organisations at the launch of the consultation is included in **Appendix A2**.

The media organisations that were issued with news releases are listed in **Table 1.3** below.

Media Organisations Contacted
Irish Farmers Journal
Irish Independent
The Irish Times
East Coast FM
KFM
LMFM
Bray People
Dublin People (Northside and Southside)
Echo Newspapers
Fingal Independent
Kildare Nationalist
Leinster Leader
Liffey Champion
Meath Chronicle
North County Leader
The Gazette
Wicklow People
Wicklow Times

Table 1-3: Media Organisations Contacted

Briefings on the project and the public consultation were offered to representatives of the media and a project spokesperson was available to speak with members of the media to discuss the project and to answer any questions.

The launch of the Stage 2 consultation and the open days held were promoted on social media through the @irishwater twitter handle.

1.2.4 Project Website

The dedicated webpage for the project was updated on the Irish Water website at the following address: https://www.water.ie/projects-plans/biosolids/

The information was published the morning of 11th May 2017 and has been available on the website since the consultation was launched. The website provided information on the background to the Regional Biosolids Storage Facility, the need for the project, the benefits of the project, the Stage 2 Report, the consultation terms of reference, the dates of the public consultation period and answers to Frequently Asked Questions.

Additional information on the RBSF project was made available on the Ringsend Wastewater Treatment Plant Upgrade (https://www.water.ie/projects-plans/ringsend/) and the Greater Dublin Drainage (http://www.greaterdublindrainage.com/) projects websites. **Figure 1.2** below shows a screenshot of the project website.

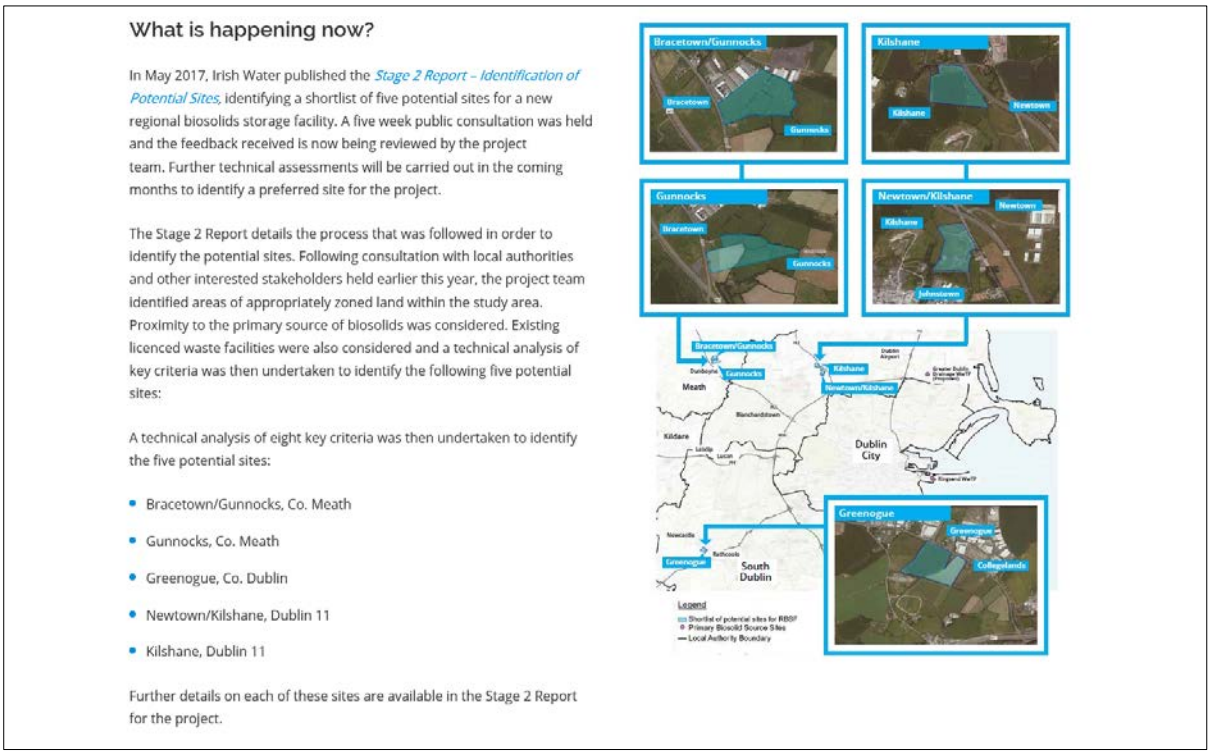


Figure 1-2: Screenshot from the RBSF Project Website

1.2.5 Project Newsletter

A project newsletter was published at the launch of the consultation and made available on the project website. A link to the newsletter was provided in email updates issued to stakeholders at the time of launch.

The newsletter provided the following information for stakeholders:

- Project overview & roadmap;
- Need for the project;
- What is biosolids;
- Overview of the site selection process;
- Information on each of the five identified potential sites;
- Terms of reference for Stage 2 Consultation.

Copies of the newsletter were available for stakeholders at the open days in May and copies were also provided to the planning counters and local libraries along with the Stage 2 Report.

A copy of the newsletter published in May 2017 for the second period of focussed consultation is included in **Appendix A3**.

1.2.6 Project Open Days

The Stage 2 Report identified five shortlisted sites in three locations. One open day was held in each location to provide information to each local community and interested stakeholders.

The open days were held as follows:

- **The Oak Centre, Maynooth Road, Dunboyne, Co. Meath, Tuesday 23 May, 1pm-7pm**
- **Citywest Hotel, Saggart, Co. Dublin, Wednesday 24 May, 1pm-7pm**
- **The White House Hotel, Newpark, Co. Dublin, Thursday 25 May, 1pm-7pm**

A number of potential venues in close proximity to each site were identified in advance of choosing the final venues which were deemed to be the most appropriate for each location. Open day displays were prepared to outline the key information contained in the Stage 2 Report. Dedicated briefings for elected representatives in the areas were offered in advance of each open day commencing.

1.2.7 Direct Engagement

A number of stakeholders and organisations were contacted by the project team at the launch of the project. These included interested stakeholders and groups; public representatives; relevant bodies; and local authorities relevant to the study area. All recipients were provided with information on the background to the Regional Biosolids Storage Project, the need and benefits of the project, the details of the Stage 2 consultation period, a link to the project website, and the details of the project's information service for further information or queries. Residents and businesses directly adjacent to each of the sites received information directly to their property regarding the project and the consultation period.

A sample copy of correspondence issued to interested stakeholders at the launch of the consultation period is included in **Appendix A4**.

Public representatives relevant to the project's study area were also contacted at the launch of the consultation period. Public representatives were invited to engage in the consultation process and to encourage their constituents to participate. **Table 1.4** below lists the public representatives who

were contacted. Members of the project team also attended the Irish Water Councillor Clinics that were held during the period of focussed engagement.

Public Representatives in the RBSF Project Study Area
Minister for Agriculture, Food and the Marine
Minister for Communications, Climate Action and Environment
Minister for Housing, Planning, Community and Local Government
Minister of State for Housing and Urban Renewal at the Department of Housing, Planning, Community and Local Government
MEPs in Dublin and the project study area
TDs/Senators in the Dublin, Meath, Kildare and Wicklow Constituencies and Spokespersons on the Environment
Opposition Spokespersons on the Environment and Housing/Planning
Elected members of Dublin City, Fingal, Dun Laoghaire Rathdown, South Dublin, Meath, Kildare and Wicklow County Councils
Eastern and Midlands Regional Assembly

Table 1-4: Public Representatives in the RBSF Project Study Area

A number of relevant bodies and organisations were contacted at the start of this period of focused consultation and were invited to make submissions as part of the consultation process. **Appendix A5** lists the organisations contacted. Organisations and individuals who had engaged during the Stage 1 consultation were also contacted.

In addition, stakeholders who had previously registered interest in the National Wastewater Sludge Management Plan, the Ringsend Wastewater Treatment Plant Upgrade or the Greater Dublin Drainage projects were contacted with information on the Regional Biosolids Storage Facility inviting and encouraging them to participate in the process.

1.2.8 Information Service & Making a Submission

The dedicated information service established at the launch of the project continued throughout the second focussed consultation period to facilitate stakeholders obtaining information on the project and making a submission to the consultation. The information service was promoted on the project website, in advertisements, in the newsletter, news releases and in all correspondence issued.

Stakeholders were invited to contact members of the project team through the lo-call phone line on 1890 44 55 67. The phone line remained available during normal business hours. Outside of these times, a messaging service was available and calls were returned at the earliest opportunity.

The project postal address was maintained and stakeholders who wished to make submissions in hard copy could do so to the following address:

Biosolids Consultation,
Irish Water,
Colvill House,
24-26 Talbot Street,
Dublin 1, Ireland.

The dedicated email address biosolids@water.ie was maintained and stakeholders were invited to submit their feedback on the consultation or seek further information from the project team to this email address.

2 FEEDBACK FROM CONSULTATION

All feedback provided to the project team is presented below under a number of headings. In total, 499 stakeholders and organisations attended project open days and/or made submissions as part of this focussed period of public consultation. Feedback received prior to the commencement of the consultation period since the close of the first consultation period has also been included. Respondents are broken down by contact method in **Table 2.1** below to demonstrate participation levels. Please note that the figure provided for open day attendance is an approximate number as not all attendees opted to sign-in.

Methods of Participation	Number Received
Open Day Attendees	128
Electronic (email) Submissions	345
Postal Submissions	24
Phone Calls	2
Total Participation	**499**

Table 2-1: RBSF Stage 2 Consultation: Participation Levels

A number of organisations issued responses or acknowledgements as part of the Stage 2 consultation and these have been listed in **Table 2.2** below. A small number of responding organisations have not been published as either the submissions received were from stakeholders responding in a personal capacity or were from private companies who did not indicate a preference in having the name of their business published.

Organisations Responding to the Stage 2 Consultation
BCM (Beechwood Lawns, Coolamber Drive, Maple Grove) Residents Association, Rathcoole
Fingal County Council
Foras na Gaeilge
Gormanston Community Association
HSE North-East
Inland Fisheries Ireland
Meath County Council
Newcastle Tidy Towns
Portmarnock Community Association
Saggart Village Residents Association
South Dublin County Council
St. Margaret's / The Ward Residents Group

Table 2-2: Organisations Responding to the Stage 2 Consultation

The following section of the report summarises issues raised and feedback provided. The below feedback is from stakeholders' submissions with repeated themes summarised and singular items of feedback directly reported. Feedback provided by individuals is unattributed and feedback from organisations has generally been ascribed. Feedback received was reviewed by the project team throughout the consultation period.

This feedback has been reviewed by the project team and where relevant, will be taken into account in the development of the Stage 3 Report. Actions or responses to queries raised in submissions are

not provided for in this report as relevant feedback will be considered by the project team and addressed as part of the Stage 3 Report for the project.

The views contained in this section do not reflect the views of Irish Water but represent the views of the stakeholders who made submissions as part of the public consultation. Accordingly, Irish Water does not attest to the accuracy of the information provided below.

2.1 OVERVIEW OF FEEDBACK RECEIVED

The following sections of the report (**Sections 2.2 to 2.10**) present the feedback provided by stakeholders as part of the consultation process under a number of headings. Feedback was received in respect of all five potential sites identified in the Stage 2 Report as well as general feedback provided in relation to the project and the proposals to manage biosolids in the Dublin region.

Feedback provided suggested that while many stakeholders believed that there was a need for the project, specific concerns were expressed over the shortlisted potential sites and the technology options chosen by Irish Water.

A number of submissions provided feedback in respect of the site selection methodology that is being used to find a suitable location for the biosolids facility. A number of criteria being used and the manner in which these criteria are being assessed were highlighted in the feedback provided. Various sensitive receptors were suggested and how these receptors should be considered by the project team with respect to separation distance and the level of possible impact from the storage facility. Some submissions questioned why site ownership and availability was not a criterion for this stage of the project. Feedback highlighted the economic impacts that the facility could have on an area in respect of both existing and future industry. Feedback in respect of planning regulations and county development plans and how these are being considered in the site selection methodology was provided. The cumulative impact of the storage facility on the areas where the potential sites are located was highlighted with various existing infrastructure facilities and their current impacts being cited.

A number of alternatives were suggested in feedback in respect of the overall proposal to spread biosolids on agricultural lands. Concerns were raised as to the impact of land spreading biosolids on the environment and a number of different technology options were cited, including incineration, as being suitable alternative methods of managing biosolids material. The storing of biosolids as part of the solution proposed by Irish Water also drew feedback from within submissions. Stakeholders provided feedback on prior experiences regarding the storage of biosolids at existing facilities and how the proposed facility will operate and be managed.

The impact of the storage facility and the associated land spreading of biosolids was raised in respect of agronomy and agricultural lands. Concern over any possible impact on human health and the environment from the proposed process was raised in connection with a number of agricultural operations. The potential impact from the process on the economy and the significance of any perceived impact on Ireland's image was cited as a concern that could arise from the project.

Micro plastics and other contaminates were specified in feedback as potentially having an adverse effect on the environment. A number of health concerns were raised in respect of the storage of biosolids and feedback was provided on the risk to human health that may arise from the chosen process.

Feedback was provided on the potential impact the storage facility could have on air quality in the surrounding area. In addition to pollution from trucks and concerns over dust pollution, many submissions highlighted a concern regarding odour issues arising from the facility. It was felt by stakeholders that odour impacts could form an unacceptable impact to neighbouring properties and that the impact from odours arising would have various negative effects on the surrounding communities. It was felt that Irish Water must use all available mitigation measures to manage any odours arising from the facility. Various sensitive receptors in respect of odour impact were listed by stakeholders at each of the potential sites identified in the Stage 2 Report and these included child care facilities, hospitals, schools, private homes and others.

Site specific feedback was provided for all of the potential sites identified and their surrounding areas. This included feedback on ground conditions including soil types and recent events such as flooding. Nearby water courses and river catchments were highlighted as part of the feedback. The archaeology of the surrounding areas was also highlighted along with recent finds identified in proximity to the potential sites.

The visual impact of the proposed facility was referenced in submissions as being a concern due to the physical scale of the development. Noise was also cited as being a concern both during the construction and operational phases of the facility.

Feedback was provided regarding the impact the facility would have on traffic as a result of trucks going to and from the facility. Concern was raised regarding the condition of the road network to accommodate additional truck movements at each of the potential sites. The increased traffic congestion arising from the facility was also cited as a concern. It was felt that this impact would be particularly felt at the times of the year when biosolids are being removed from the facility to be spread on lands. Noise and pollution from trucks were of further concern and the feedback suggested that journey times should be minimised to reduce the additional hazard that trucks create on the roads.

A number of queries were raised in respect of the operational phase and how the storage facility will be operated and managed. Ongoing safety at the facility, once operational was cited as a concern as was the management of operations once the plant was constructed, including Irish Water's ongoing role. Feedback provided also queried how the operations of the plant would impact on a number of existing infrastructure facilities.

Feedback was provided on the communications and consultation carried out on the biosolids storage facility project to date. Concern was expressed that an insufficient number of stakeholders had engaged with the project to date and that more should be done to inform and involve people in the consultation process to come.

2.2 PROJECT NEED

Submissions received indicated that while many stakeholders accepted the need for the facility in the region there were specific concerns regarding the proposed shortlist of potential sites.

Feedback was provided that there is a view that Irish Water are developing this facility in response to pressure to comply with EU regulations and that other options could be explored. The feedback indicated a desire for Irish Water to fund local community groups who will be living adjacent to the biosolids facility to source professional expert advice so that an opposing view can be represented, on an equal footing, to the authorising authorities.

Other feedback noted that the approach outlined by Irish Water to managing biosolids was a vast improvement on the older methods of dumping sewage at sea.

Feedback was provided that more information on the capacity numbers at Ringsend was needed and that all growth factors in the region must be adequately accounted for so that the facility and related projects can be properly planned.

It was noted that there is a high level of septic tank usage in the areas surrounding the potential sites at Kilshane in Fingal. It was suggested that as part of the project, these homes could be connected to the public wastewater network.

2.3 SITE SELECTION METHODOLOGY

Feedback was provided on the criteria used to identify the five shortlisted potential sites. It was suggested the criteria should take account of proximity to large residential areas; retail businesses; food processing and related industries; and proximity to water courses and flood risk areas. It was felt that had these criteria been considered, the potential site at Greenogue would not have been included as an option. It was felt that the process should be revisited and other site options considered.

South Dublin County Council in its submission noted the process that Irish Water is undertaking to locate a site for the biosolids storage facility, the project's significance to the region and noted the identification and specifications of the Greenogue site. The submission requested that Irish Water demonstrate that all decisions made in respect to site selection are consistent with relevant planning policy considerations at national, regional and local level and meet the requirements of all relevant planning and environmental legislation. The Council's submission went on to state that Irish Water must make decisions in an open and transparent manner in accordance with the proper planning and sustainable development of the area.

In its submission, Meath County Council welcomed the opportunity to contribute to the consultation and noted that two of the five shortlisted potential sites were located within County Meath, close to Dunboyne. The submission referenced the County's Economic Development Strategy completed in 2014 which has a key target of delivering 7,500 jobs to the County by 2022. This Strategy identifies Dunboyne as one of five areas designated as regional anchors for enterprise and employment

growth in the County to reduce the need for residents of Meath to travel outside the County for employment. The submission noted the following:

> Variation no 3 of the Meath County Development Plan 2013-2019 aligns the County Development Plan with key tenets of the Economic Development Strategy as they related to statutory land use planning and was completed in May 2016. This variation prioritises the progression of economic development initiatives within the county. The lands in County Meath identified as part of the site selection process were zoned for E2/E3 strategic employment used as part of the variation No 3 process. A spot objective designating these lands for Foreign Direct Investment was attached to these lands at the request of the Department of Housing and Planning.
>
> The attractiveness of Dunboyne as an employment location is endorsed through high profile announcements of significant FDI employment in the area by Facebook, Shire, and Aramark (Avoca.) In particular, 400 highly skilled jobs will be created in the first phase of the Shire bio-pharma manufacturing facility over the next four years. Up to 200 jobs will be created at the Facebook Data Centre in Portan, Clonee. This is in addition to the 1,300 jobs created during the construction phase. Aramark (Avoca) has opened its largest retail facility in Ireland in Dunboyne which has resulted in the creation of 80 jobs.
>
> In summary, Meath County Council has identified these lands for specific high end employment uses following on from the preparation of an evidence based Economic Development Strategy for the County in 2014. The strategy was endorsed by the Meath Economic Forum, the Planning, Economic Development and Enterprise Strategic Policy Committee and the Elected Members and Executive of Meath County Council and as is set out above, the strategy is beginning to deliver the anticipated high end employment in the FDI Sector at this location. Any land use which fails to support and compliment what is now the established pattern of development in this area cannot be supported by Meath County Council.

Meath County Council identified lands they believed more suitably zoned for the biosolids facility as part of the Stage 1 Consultation and their submission included reference to these lands. Other feedback further queried why the lands suggested by Meath County Council had been ruled out of the site selection process and that while it was understood that the facility could be located in Meath, there was less houses in close proximity to the lands suggested by the Council.

Feedback received suggested that the facility should be kept as far as possible from all residential homes. In respect of the potential site at Kilshane in Fingal, it was noted that more than 10 private residences would be adversely impacted by the development and it was felt that this is contrary to Irish Waters stated objectives of minimal impact to community. Queries were raised regarding Irish Water's powers to compulsorily purchase land.

One stakeholder criticised the site selection process as being inherently flawed as a result of two of shortlisted sites being adjacent to two other sites, leaving only three potential options. In addition it was felt that the transportation criteria of selection process were given too much weight in lieu of the criteria relating to the proximity to sensitive receptors. This was felt to be driven by cost impact. Furthermore, the definition of sensitive receptors used was too narrow and needs to be broadened to include, for example, employees working in neighbouring business/industrial complexes. It was

felt that if this criterion was changed, a different set of more suitable sites would have been identified by the selection process.

Feedback noted that the next steps of the process, identified in section 6.0 of the Stage 2 Report, referenced a 500m radius for consideration of sensitive receptors. It was felt that this was too small and that a conservative approach should be taken of 5km owing to the subjectivity and difficulty of quantifying odours.

It was suggested that the storage facility should be located close to the spread lands in South Leinster which would make it easier to distribute the material to the farmlands where it is used. Conversely, it was suggested by the BCM Residents Association in Rathcoole and others that the facility would be best located close to where the majority of the biosolids are produced in Ringsend and so reduce the transport time of the material.

It was queried in feedback why people's homes and property were not afforded the same protection as schools, parks and other amenity areas. It was felt that private property deserved the same protection as a public amenity. It was also felt that if public amenities are afforded greater separation distances, how can residents be certain that a lesser separation distance for houses is sufficient.

The proximity to the secondary school and Montessori schools in Dunboyne was noted as being an unacceptable impact if either of the sites in Co. Meath were chosen as the preferred site.

Feedback indicated a concern regarding the proximity of the potential sites at Kilshane in Fingal to the three schools in the parish at Rivermeade, Killcoskan and St. Margarets. One of these schools is currently located between the approaches to the existing and proposed runways at Dublin Airport.

A request was made to view the scores of the assessment carried out to date across the eight criteria used to identify the five potential sites.

It was noted in feedback that while the spread lands are currently in south Leinster, these could in time, change to lands in closer proximity to the storage facility.

Feedback noted that while the potential sites at Kilshane in Fingal were zoned for heavy industry, and that this was appropriate, the community was concerned that the 'wrong type of industry' would develop.

One stakeholder was of the view that the potential sites in Co. Meath were in such proximity to a number of facilities that the potential sites were at variance with Irish Water's own objective to avoid endangering human health or harming the environment. These included St. Peters College, Dunboyne National School, Dunboyne Train Station, Dunboyne Village, Elms and Old Fairgreen housing estates, St. Peters Church and development land adjacent to M3 Parkway Station.

A submission was received in respect of the potential sites at Bracetown/Gunnocks in Co. Meath that stated that the sites identified did not meet the criterion set out in the Stage 2 Report in respect of sensitive receptors and that the development was contrary to the area's zoning. The submission highlighted Tetrach Grove (with its 9 residential units) and a major land bank zoned A2 "New Residential" in the current Meath County Development Plan (2013-2019). The submission stated

that the zoning in this area promotes the creation of new residential communities with ancillary community facilities, neighbourhood facilities and employment uses. It was felt that a biosolids storage facility was not in keeping with these objectives. Other neighbouring properties in Bracetown, Bennetstown and the protected structure 'the Gunnocks', were referenced in the submission and highlighted in maps provided. The submission noted that residential properties are identified as sensitive receptors in the Stage 2 Report and it was felt that the proximity to these receptors made the potential sites unsuitable. The proximity of the potential sites to a grain processing business was also highlighted as being unsuitable and it was felt that a cumulative detrimental impact would be imposed on the Bracetown Business Park and the adjoining 'Hub' facility.

Feedback received questioned why the criteria used would suggest a shortlist of just five sites from Greater Dublin. It was felt that more lands could have been considered from a zoning perspective including "white lands". It was also felt that numerous sites in Greater Dublin would better meet the criteria of size and configuration, transportation, planning status and history, archaeology and engineering feasibility, in addition to proximity to the source of biosolids. It was also suggested that site ownership and availability was not identified as a criteria and that should difficulty be experienced in purchasing lands, it would indicate that publicly held lands would be more desirable.

2.3.1 Economic Considerations

The proposed site at Greenogue was cited as being an inefficient use of the land in this area as the facility will result in low numbers of employment, relative to the size of the land-take. The use of this land for development that results in higher employment levels would be seen as a positive to an area that has a large population and needs employment opportunities. It was noted that the use of EE-Zoned land for the potential site at Greenogue, together with infrastructure serving the site, should be used to provide a greater employment benefit for the community. It was noted that the need for office space is at a premium and the lands should be protected for this use.

Feedback was received regarding both of the potential sites at Dunboyne, Co. Meath and the potential site at Greenogue, in respect of the perceived detrimental effect the development of the facility could have on the areas' ability to attract future industry and investment. This investment is seen as key to creating future employment opportunities particularly in areas where development land is scarce. Furthermore, the facility being located in these areas may impact on current businesses in the area and their attractiveness in the marketplace. In relation to the potential site at Greenogue, the Greenogue and Aerodrome Business Park including the Irish Centre for Manufacturing Research were referenced in this regard. Stakeholders in this area provided feedback that they did not wish to see the facility developed at the potential site at Greenogue owing to concerns about the development from certain local businesses. It was stated that the Greenogue Business Park employs approximately 6,000 people across 450 companies and concern was raised as to the impact on air quality and the working environment. The business park is also home to a number of temperature controlled food distribution facilities that circulate huge volumes of air for both cooling and heating purposes. The risk of contamination of products if the air quality is affected by the biosolids storage facility was highlighted as a concern.

Proximity to new industry close to the potential sites in Co. Meath were referenced as a concern and that the facility may impact negatively on the research and development businesses, the hub business park, the Facebook data centre and the retail offering of Avoca in the area. Another stakeholder referenced other businesses such as Astellas, Helsinn and Rottapharm pharmaceutical companies and their requirements for clean air and water to support their processes. It was felt the

storage facility at this location could impact upon their operations. It was also felt that the facility would do little to support the IDA's policy of attracting inward investment to the region.

The negligible economic benefit of the biosolids storage facility was referenced in feedback received as a concern for stakeholders. The potential negative effect of the facility on property prices in the neighbouring areas was also noted. A related effect of the facility on the ability to sell or lease property or land in proximity to the facility was cited as a concern. With regard to the potential sites in Co. Meath, the effect of the M3 motorway development on property prices in the area was still being experienced and it was felt that the storage facility would only exacerbate this for property owners.

A local business provided feedback regarding a concern that their proximity to the potential sites near Dunboyne, Co. Meath would have a negative impact on their business. This concern was centred on the impact of odours from the facility that they feared would discourage people to do business with their feed, seeds and agri-merchant business. It was felt that this might negatively affect their reputation and that the increased HGV traffic to their area could affect customers' ability to get to and from their premises. Further feedback expressed concern on the impact the facility would have on a variety of local businesses in the area.

Feedback provided felt the two potential sites in Meath were unsuitable due to their proximity to Bracetown Business Park which was an area of high employment and the planned extension to nearby office space to the rear of Lacken Plaza. The sites were also felt to be unsuitable due to the presence of the M3 motorway, the M3 Parkway train station and the associated park and ride facility, as well the plans to electrify the railway line to Dunboyne. It was felt that using this land for a low employment facility did not make economic sense and did not maximise the existing infrastructure already in place. Further feedback noted plans for a large number of residential dwellings and accompanying retail and commercial units adjacent to the train station at Pace. It was felt the development of the storage facility could endanger these plans from proceeding.

A pharmaceutical company, with a storage and distribution facility close to the potential site in Greenogue, made a submission in which they raised a number of concerns regarding the impact the biosolids storage facility could have on their business and the local environment. The company felt that additional traffic on the local roads would impact their distribution operations and their staff travelling to and from work. In addition to congestion entering and exiting the N7, the submission referenced a concern for trucks taking a right-hand turn into or out of the site at Greenogue. The impact of odour and dust was also a concern and the submission questioned the ability of the facility's odour and dust control measures owing to the large size of the storage units and the high level of trucks entering and exiting, particularly when material is being removed from the facility. The control of pests, such as vermin, birds and insects was also an issue and the submission felt there was a lack of clarity from Irish Water on how this would be managed. The scale of the buildings required for the facility raised a concern in respect of visual impact and the impact on natural light at their nearby property. The impact on property values is also a concern and the submission noted that compensation would be due to any property owner and occupier who are negatively impacted by a reduction in property values. The submission stated that the above reasons gave rise to a concern regarding the impact the facility would have on the businesses' impression, brand and reputation. This was of considerable concern as the company felt the standard of the environment in which they operate their business is a key factor in their economic competiveness and success. The presence of the facility could impact their business when customers, clients or Health Products Regulatory Authority (HPRA) auditors visit their premises. Environmental impacts from the facility needed to be clarified in relation to an impact on flooding

and possible contamination of the nearby streams and watercourses. The submission noted that the area is subject to high winds, which are prevailingly from the west and would bring odour, dust or pests in the direction of their facility.

Transport costs in respect of the proposed sites in Co. Meath were noted as having to be higher than those at other shortlisted potential sites owing to the greater travel distances between Ringsend and Co. Meath. This was felt to be contrary to Irish Water's objective to "drive operational efficiencies". Calculations were included in a submission stating that these sites would see hundreds of thousands of additional HGV kilometres travelled over the design life of the facility.

2.3.2 Planning Considerations

Proximity to population was referenced as a key concern in respect of all five potential sites. Feedback received indicated a preference for the facility to be located as far from population centres and homes, including individual homes, as possible. In respect of the Greenogue site, the population centres of Newcastle, Rathcoole and Saggart were referenced in addition to existing homes and other community facilities such as the Grian na nÓg crèche. In relation to the potential site at Greenogue, it was felt that it was inappropriate to locate a biosolids storage facility in such close proximity to a crèche (Grian na nÓg) where up to 150 children make use of the crèche's outdoor spaces each week. It was felt by some stakeholders that the facility was at odds with the nature of the area which was primarily residential. The need for greenspace in the area was also referenced and that the development of the storage facility would impinge further on this. As the population centres are growing, it was felt that the space will be needed to accommodate this growth. Feedback from the Saggart Village Residents Association referenced Census 2016 data which indicates that Saggart and Rathcoole are the two fastest growing towns in Ireland. It was felt that elderly people living in very close proximity to the potential site should also be considered and the impact upon them taken into account.

Proximity of the facility to individual homes and small groups of houses was referenced as a concern. In respect of the potential sites in Co. Meath, the proximity to the Tetrarch Grove housing estate was noted as being too close to the facility and that greater consideration should be given. It was also felt that proximity to future housing developments (such as the planned development next to the M3 Parkway Train Station) and potential future housing developments should also be considered.

In respect of the two sites shortlisted in Co. Meath, feedback was received to say that the proposed development would not be in keeping with the developing character of the area which has seen recent high-tech developments such as Facebook's data centre in Clonee and the Shires pharmaceutical plant. It was felt that a biosolids storage facility was not in keeping with the Meath County Development Plan 2013-2019 which rezoned a large bank of land to the north of the M3. It was felt that the nature of the proposed biosolids storage facility would not encourage further high-tech industry, or indeed any industry, to locate in the surrounding zoned lands and it was felt this could have a detrimental effect on the potential future employment in the area.

It was noted in feedback that the use of the lands for the potential sites in Co. Meath as a biosolids facility were at variance with the intentions of Meath County Council's zoning. It was felt that in taking this position, Irish Water are failing to meet their own objectives to be normally compliant with regional planning guidelines, city/county development plans and local area plans. It was also

stated that as Meath Co. Co. had suggested an alternative site, it could be determined that the potential sites at Gunnocks are contrary to the county development plan.

A submission stated that the potential sites at Bracetown/Gunnocks in Co. Meath were part of lands zoned E2 and E3 in the Meath County Development Plan (2013-2019) for enterprise and employment and close to another site zoned T1 for the M3 Parkway at Pace. The submission noted Meath County Council's promotion of the area in recent times, specifically Meath County Council's Dunboyne Clonee Growth Corridor Strategy Framework Guidance proposal (December 2015). The recent decision to permit the construction of 500 homes at Pace was also noted. In light of these factors, and Meath County Council's responsibility to ensure development in the wider area is complimentary, it was felt that the proposal to develop a biosolids storage facility was not in keeping with the zoning of this area. The developments by Facebook and Shire in this wider area were also referenced in the submission.

It was noted in respect of the potential sites in Co. Meath that any development proposed for these locations which does not make use of the nearby railway line results in insufficient use of this valuable infrastructure.

The potential impact of the facility on tourism was questioned. This was raised in respect of the potential site at Greenogue and its proximity to the N7 and the many hotels along this road.

The proximity of the potential site at Greenogue to the heritage village of Newcastle was referenced as being a constraint that should be considered in assessing the site options.

Feedback from stakeholders living proximity to the potential sites in Co. Meath stated that the facility should be located in Co. Dublin as this is where the biosolids is being produced and Meath should not have to cater for Dublin's waste. The submission went to note that they and many of their neighbours use septic tanks in their homes and so do not avail of Irish Water's wastewater network.

One stakeholder noted in feedback that the overall assessment of the related projects (the Regional Biosolids Storage Facility, the Ringsend WwTP and Greater Dublin Drainage) together with the spread lands would all need to be considered by the consenting authorities following the outcome of the O'Grianna judgement.

It was noted in feedback that a remote rural setting was the most appropriate location for the storage facility.

Feedback referenced the Governments Code of Good Practice for the Use of Biosolids and the 200 meter separation distance in respect of spread lands. It was felt that this logic should apply to the storage of biosolids and was even more relevant in respect of storage as while spreading took place once a year, the storage facility operated year-round.

The height and scale of the facility at the potential site at Greenogue was cited in feedback as being out of proportion with the surrounding area. It was also felt that the potential site is currently the only green land between the nearby industrial estate and housing in the Tay Lane area and that the storage facility would bring the houses closer to the industrial area.

An alternative site for the facility was suggested at the Balleally Landfill site near Lusk, Co. Dublin. It was suggested that an advantage of this site was its proximity to the Irish Sea to the east, where the prevailing winds would carry any odours out to sea.

Feedback suggested lands bought for the development of a prison near the North Road in Finglas / Collegelands would be a good location for the biosolids facility.

It was noted in feedback that brownfield sites are more suitable to a development of this nature and that greenfield sites should be avoided.

Feedback in respect of the potential site at Greenogue referenced the Grian na nÓg crèche as a sensitive receptor as per Section 4.3.7 of the Stage 2 Report. It was felt that the crèche which has been operating for seventeen years should have been identified and used to rule-out the site from the shortlist as per the project's site selection methodology. Other feedback noted that the crèche is zoned as a high amenity area in the local area development plan and how its proximity (approximately 200m) makes the potential site unsuitable.

Citing Section 4.3.9 of the Stage 2 Report, feedback indicated that the Greenogue site could not be used unless additional road infrastructure was provided and the view was presented by one stakeholder that this made the site a less suitable location for the facility, under the criteria outlined.

Feedback in respect of the potential site at Greenogue referenced a number of community facilities that could be affected by the development of the project with Peamount United Football Club, St. Finians GAA Club and Commercials GAA Club being referenced specifically. The national schools in the area were also referenced as being sensitive to the development of the facility.

2.3.3 Cumulative Impact

Feedback was provided on the impact the facility may have on the potential sites at Kilshane in Fingal. It was stated that this rural area is being overtaken by a gradual industrialisation and the expansion of Dublin Airport. Residents provided feedback that they are a close-knit rural community and that the storage facility would further erode the agricultural character of the area. The impact of the airport expansion and the possible introduction of night time flights were placing a considerable burden on the area. It was felt that the cumulative impact of potential odours from a biosolids storage facility was unfair on a community who lived with the impacts of the neighbouring airport.

The development of new homes close to the potential site at Greenogue was referenced as having placed additional pressure on the road network and concern was raised that the lack of existing infrastructure to serve the area would be exacerbated by the development of the facility.

Feedback in respect of the potential sites at Kilshane in Fingal stated the area is already heavily impacted by industrial development and cited blasting from the nearby Roadstone quarry, emissions from the Huntstown Power Station and the traffic arising from a proposed new anaerobic Stream Power Plant as examples. Residents in the area were promised a quieter environment upon completion of the M2 motorway and it is felt that the biosolids facility will bring additional traffic from trucks to the area. A concern regarding the cumulative impact of these developments was

highlighted as leading to a decline in the fabric of the existing community and a halting of community development.

The BCM Residents Association noted that their community in Rathcoole is already engaging with Irish Water regarding the impact of the development of a 1.2m water main from Saggart to Peamount. It is felt that the potential site at Greenogue would constitute further impact on this community.

Concern was noted in respect of future plans for development of the storage facility post commencement of the operational period. As the amount of biosolids being produced will increase over time, it was suggested that it was likely that the storage facility will be expanded adding further impact to the receiving community.

Noise impact from the facility was referenced in respect of the potential sites in Co. Meath who cited the existing noise impact from the M3 motorway and the cumulative effect of an additional noise source close to their homes. A related issue in this area would be the additional trucks serving the facility as the area already experiences trucks parking in dangerous areas, obscuring motorists' views and causing a road hazard.

Stakeholders living close to the potential sites in Co. Meath noted the odours coming from the Kepak complex on warm days and referenced the cumulative impact that a biosolids facility would have in addition to this. Concern was also raised regarding odours from the treatment plant in Kilbride.

The cumulative impact of traffic near the potential sites in Co. Meath as a result of the Facebook, Shire and other developments in the area was referenced, including the construction of hundreds of new homes in Dunboyne and a wind farm in the area.

2.4 ALTERNATIVES

The use of biosolids as a fertiliser on agricultural lands was questioned by some stakeholders who urged Irish Water to consider another method of reusing biosolids material. One stakeholder urged that consideration be given to the EPA published research project into the application of biosolids to agricultural lands, *Health and Water Quality Impacts Arising from Land Spreading of Biosolids,* undertaken by researchers from NUI Galway, Teagasc and UCD and led by Dr. Mark Healy.[1] The findings noted that while many of the issues are perceived, there remains considerable concern over the presence of metals, nutrients, pathogens, pharmaceutical and personal care products (PPCPs) and other endocrine disrupting and synthetic compounds found in biosolids, which may cause environmental and human health problems. The above report was also referenced in respect of the impact of the build-up of these contaminates in the soil over many years of application to land and concern was noted in respect of the unknown long-term effects on health. As a result, it was felt that the storage of biosolids should be removed from population centres as a precaution.

[1] Healy et al, *Health and Water Quality Impacts Arising from Land Spreading of Biosolids* (EPA, 2017) http://www.epa.ie/pubs/reports/research/land/EPA%20RR%20200_web%20Essentra.pdf

The use of land spreading biosolids was cited as being an unsuitable long-term option for dealing with biosolids arising from wastewater treatment plants. Incineration, while not being a net-producer of energy, was noted as being a more sustainable, secure, controllable and environmentally friendly management option. It noted that in the UK a process has been developed of extracting phosphates without the use of incineration and this was suggested as being a preferable process to land spreading. Other feedback referenced the use of the incinerator at Poolbeg to dispose of biosolids and noted that its proximity to the Ringsend Wastewater Treatment Plant was in line with the "proximity and polluter pays principle" to process waste materials close to their source.

Feedback provided raised concerns regarding the effect of micro plastics found in biosolids on the environment when spread on agricultural lands. This point was noted as being a potential issue for the EIA and EIS (EIAR) associated with the project. A recent BBC television programme (*Countryfile*) was referenced and it was also noted that the UK may not continue the practice of land spreading. It was felt that other alternative ways of handling biosolids should be sourced from overseas following negative experiences of biosolids storage and land spreading in other countries.

An alternative process for the processing of biosolids that takes place at wastewater treatment plants was suggested as part of feedback received. Engineered biochar is produced by the thermal-treatment (slow pyrolysis) of biomass. It can be produced from a variety of organic waste streams such as municipal sewage sludge and transforms the sludge into a value-added material for various applications while eliminating pathogens, mitigating odour and destroying chemicals such as endocrine disruptors and other toxins. The process reduces the volume of the material by 70-80% as well as offering several other benefits such as retention of moisture and nutrients in the soil, preventing leaching of nitrates from soils into underground water bodies, preventing uptake of heavy metals into plants, balancing soil pH and increasing soil nutrient exchange capacity.

In their submission, Gormanstown (Co. Meath) Community Association suggested that the biosolids storage facility be located at the site of the existing wastewater treatment plant in Dublin City. They suggested that clarity is needed on which wastewater treatment plants will use the regional storage facility and whether biosolids from outside the region will be stored there. Their submission stated that other European Union countries are moving towards incineration to recover energy from biosolids. Citing Irish Water's National Wastewater Sludge Management Plan, the group stated that the incineration of biosolids in the Netherlands is at 95% and is at 83% in Belgium, with other European countries following closely behind. The proximity of the Dublin Waste to Energy plant to the Ringsend Wastewater Treatment Plant is opportune and the Indaver waste to energy facility at Carranstown, Co. Meath should not be dismissed by Irish Water as an incineration option. The group also felt that Biogen, a UK based company offering alternatives to land spreading should be consulted by Irish Water.

An alternative facility was brought to the attention of the project team located in Ballivor, Co. Meath. This existing facility had a current capacity for 7,500 tonnes and was accepting sludge from various treatment plants. When the company's new anaerobic digester in Roscommon comes online, the site in Meath will become available.

Feedback queried why alternative transport options had not been looked at, including the transporting of biosolids by ship or by rail.

It was noted that as an alternative to storing and land spreading biosolids, burying the material would remove the odour impact.

2.5 BIOSOLIDS & STORAGE

Feedback provided referenced the experiences of neighbouring residents of a biosolids storage facility in Co. Carlow who had confirmed that there was a smell from the facility. Further feedback referenced negative experiences of the neighbours of this facility as including disruption caused by trucks going to and from the facility, often at night, and the noise from the fans/machinery used at the facility. The material stored in the facility in Carlow previously went on fire as a result of the build-up of combustible gases. It was stated that these gases must be released and the facility ventilated and that odour was released affecting those living nearby who had to dry laundry indoors and keep their windows closed during summer months. Feedback received also reported an early morning smog surrounding the facility in Carlow and it was felt that these experiences in Carlow were at odds with the information that is being provided to stakeholders on this project.

Feedback provided referenced an existing biosolids storage facility in an isolated rural area in the Midlands. Following a visit to this facility, residents living near to the existing plant had experienced issues with odours coming from the plant at a radius of up to two miles. Details were requested regarding the existing biosolids storage facilities in Ireland.

Feedback referenced a risk of disease/infection from living in close proximity to stored biosolids material. Some feedback indicated that the stored biosolids were viewed as a hazardous waste or a biohazard and concern over the concentration of heavy metals in the material was referenced. One stakeholder queried why biosolids are not pelletised.

Concern was raised of the possibility of toxins being released into the atmosphere from the storage of biosolids at the facility. Feedback also indicated a view that biosolids contain viruses, bacteria, pathogens and other contaminates that cause health risks for the population. The chemicals used in the biosolids treatment process were also a concern presented in the feedback.

Feedback provided outlined concern over the proposed method of management of biosolids and referenced a number of research papers that highlight the impact on the environment including: that biosolids are not different from other chemicals such as pesticides and these materials are becoming an increasingly recognised chemical risk; that the benefit derived from biosolids recycling does not offset the perceived health and safety risks; and that biosolids impact soil phosphorous accountability, fractionation and pose potential environmental risk.

Feedback provided questioned the regulatory / monitoring process that could satisfactorily gather biosolids from multiple sources and without homogenising the product and still be able to produce a consistent product that meets requirements in respect of heavy metal content, toxicity etc.

2.6 AGRONOMY

Gormanstown (Co. Meath) Community Association stated that unlike other European Union countries, the Irish economy is heavily dependent on agriculture and horticulture and that our reputation in this area is critical. Ireland prides itself as being a clean country producing healthy food and dairy products for markets at home and abroad. It was felt that as the land spreading of biosolids is detrimental to human and animal health and the environment, it has the potential to damage the Irish economy. It was said that even tertiary wastewater treatment will not remove all the toxic constituents from sludge. The continuing and increasing use of biosolids as a fertiliser in Ireland poses a great danger to our economy and is perceived by many as opting for the least costly method for disposing of wastewater sludge. The group noted that this view was supported by hundreds of documents available on the Internet that relate to the constituents, treatment and impact of wastewater sludge on human health and the environment.

Concern was raised by the Gormanstown (Co. Meath) Community Association regarding the use of Dublin-produced biosolids on lands in the east and south of Leinster and that this will increase in the years ahead. It was suggested that the Department of Agriculture, the Department of the Marine, and the EPA conduct a full investigation into the current use of biosolids by Irish Water and do so in light of current international standards, studies and research prior to the selection of any site for the biosolids storage facility. The group noted their concern that Irish Water have failed to research the implications of the continuation of land spreading of biosolids on Irish farmland and the capacity of Irish Water to manage this project.

Micro plastics and other contaminates entering the human food chain as a result of the land spreading of biosolids was cited as a concern. A view was stated that the UK are considering banning land spreading of biosolids on these grounds and feedback requested Irish Water to reconsider their proposal.

Concern was raised on the use of biosolids as a fertiliser on agricultural lands and the possible impact of this on the receiving environment. Concern that biosolids would come into contact with fruit and vegetables for human consumption was highlighted.

Feedback was provided regarding a concern that land spreading poses a risk of contaminating the human food chain and is restricted by Bord Bia to animal and energy crops. Concern was expressed that land spreading relied on agreements with landowners and was a highly restricted activity. The quantity of available spread lands for use was queried. A concern was raised in respect of possible future legislative restrictions being imposed on land spreading and the impact this could have on Irish Water's proposals.

Feedback referenced a negative experience of land spreading previously in Mulhussey, in the Ratoath Municipal District and in Adamstown, Co. Wexford. In Ratoath, the feedback stated that people developed rashes, nausea, headaches, respiratory issues, sore eyes and that a school had to be closed as a result of exposure to land spreading of biosolids. Details were provided in feedback regarding the quantities of biosolids spread on lands in the Ratoath Municipal District in recent years and the number of inspections carried out by the local authority.

It was queried whether Irish Water had carried out sufficient research on the long term effects of applying low levels of heavy metals, plastics and chemical residue to the soil. Concern was raised that as land changes use from year to year, there is a risk that contaminates could find their way into

crops for human consumption. A view was given that biosolids should only be spread on forestry lands for this reason. The effect of the consumption of plastics by pigs and the subsequent damage to that industry was referenced as an example of the impact that can experienced following incidents of contamination. It was also queried why this process was deemed acceptable when pumping the material into the sea was considered detrimental to the environment.

The potential impact of the facility on local bloodstock operations was referenced as a concern in respect of the potential site at Greenogue.

Concern was raised in respect of existing land spreading of biosolids currently produced at the Ringsend Wastewater Treatment Plant. It was suggested that some practices were currently operating outside of the rules set down by several grain millers.

It was noted in feedback that Irish Water did not appear to have any responsibility with regard to the environment once biosolids had been spread on lands. This was noted as a concern and that monitoring should be undertaken to ensure standards are maintained. One stakeholder stated a belief that land spreading was responsible for the outbreak of serious diseases in recent years.

The impact of the presence of the biosolids storage facility on part of a farm in County Meath and its impact on neighbouring farms was a concern in respect of the potential sites in Co. Meath. The Bord Bia Quality Assurance scheme was referenced and the perception that may be taken by inspectors as to the presence of such a facility on produce coming from these farms. The negative impact of the facility on supermarket chains' assessments of the food production lifecycle were cited and the impact that this could have on market prices of farm produce, the ability to farm and the effect on property values were stated as concerns.

The potential sites in Co. Meath were stated as having a negative impact on farm operations as they will reduce the overall size of the farm holding making the farm less economically viable for future generations. It will also make aspects of the farm unworkable by dividing fields and restricting access to parts of the holding. It was felt the access roads into the farm are farm access roads only and so not suitable for HGV traffic.

2.7 ENVIRONMENT

Feedback noted the need for an Environmental Impact Assessment (EIA) to be carried out as part of the project to ensure that any effects of the facility were understood.

Feedback noted the impact of the use of lands for low employment activity at the potential sites in Co. Meath would be to increase the County's carbon footprint as those who could have found employment in their locality would need to travel further to find work.

2.7.1 Air Quality

Odour was raised as an issue by many stakeholders who provided feedback as part of the consultation. Concerns were in relation to odour arising from material stored at the facility and

from material in trucks while being transported to and from the facility. It was also noted that odour impacts during the loading and unloading of the material at the facility was a concern as this was felt to be when the material would have the highest odour impact. It was felt that odour from trucks will be particularly relevant in the early stages of the journey when the odour emissions rate of the material will increase after it has been freshly disturbed. A number of sensitive receptors in respect of the impact from odour were cited close to the potential sites.

Feedback referred to concerns over the impact of air quality on family life with stakeholders referencing the environment in which they and their children live. At the Greenogue site, the proximity of the Grian na nÓg crèche was referenced by stakeholders as being a concern. It was felt that odours arising from the facility would negatively impact the children at play in the crèche's extensive outdoor areas. The outdoor areas include a Sensory Garden which was built using a DCYA grant and is of great benefit to the crèche's high percentage of children who have sensory processing issues. These issues include children who have been diagnosed with autistic spectrum disorders. Potential air pollution from the facility was referenced as a concern for the crèche arising from the facility and the pollution that would be caused by additional trucks servicing the facility. Grian na nÓg care for some children that require additional support due to sensory sensitivity and odour from the site could impact these children more than most. Many of these children have benefitted from the high standards of care offered at Grian na nÓg and potential odour impacts from the plant could be detrimental to their development. Some parents stated in their feedback that they could consider sending their children to a different crèche if the project was to proceed at the potential site at Greenogue.

Odours from trucks transporting biosolids materials that will pass by homes and community facilities were referenced as a concern. It was felt this potential impact could be made worse when trucks are caught in slow moving traffic on congested roads. Risk of trucks shedding their loads along the haul routes was also raised in feedback provided. This was highlighted specifically in respect of the R120, close to the potential site at Greenogue. In addition to odour issues from trucks, stakeholders referenced the impact of the additional exhaust emissions from the trucks going to and from the facility.

Concerns were raised in respect of odour containment at the facility. It was noted that the odours arising from biosolids varied depending on the process carried out at the waste water treatment plant and concern was expressed as to how the varying odours could be managed. Further concern as to the containment of odours when the doors of the facility were opened to allow trucks in and out were expressed. It was further indicated that redundancy for the odour control units should be installed at the facility so that odour can be managed in the event of a malfunction. The cost of odour control methods was referenced as a concern as these may not be operated sufficiently when operational in an attempt to reduce operating costs.

Feedback suggest that the prevailing winds should be considered in respect of the impact of odour release at the facility and that the facility should not be located up-wind of residential areas. It was noted in respect of the Greenogue facility that residential areas were located down-wind of the facility, according to data available from Met Éireann. Concern regarding odour from the facility was raised in respect of the community at Coldwinters which is downwind of the prevailing winds from the potential sites at Kilshane in Fingal.

Feedback in respect of air quality and the impact of odours referenced the surrounding countryside environment of the sites at Dunboyne, Co. Meath and Greenogue. Feedback indicated that many

people chose to live in these areas as a result of the countryside environment and that siting the biosolids storage facility in these areas would detract from this lifestyle.

It was noted in feedback that there was a potential negative impact from the facility on retail and food processing businesses that can be found in proximity to the Greenogue site, arising from odour releases, particularly during the transporting of material to and from the facility.

While feedback noted that controls in respect of odour release were in place at the facility, it was requested that trucks used to transport the material to and from the facility should be fully sealed to minimise odour and environmental impact on the receiving community.

Peamount Hospital was referenced in feedback as a sensitive receptor close to the potential site at Greenogue. It was felt that any impact to air quality, including that of odour, affecting the hospital was not acceptable.

Feedback received noted that the potential sites in Co. Meath are located in an area with numerous sensitive receptors in close proximity which could be affected by odours from the facility and from the transportation of material to and from the facility. These include, within 1km of the site, private residential dwellings and Bracetown Business Park and many more within 2-3km of the site, including Dunboyne town and the proposed residential development at Pace. It was stated that as odour can travel over many kilometres in favourable weather conditions, these sensitive receptors could frequently be affected by the proposed development. The feedback stated that exposure to these odours can contribute to both mental and physical illness in populations including nausea, vomiting, headaches, anxiety, stress and sleeplessness. Furthermore, exposure can place undue demands on people's lifestyles for example, not being able to open windows, hang clothes to dry or eat outdoors.

Concern was raised as to the effectiveness of the odour control measures to maintain the facility under negative pressure, in light of the number of truck movements when the biosolids are being removed from the facility. Concern that no odours will be released from the facility once operational despite control measures was raised.

A stakeholder referenced smelling a sample of biosolids at the information event in Fingal and found the odour to be unacceptably unpleasant and is concerned that this odour would be present year round in the community at Kilshane.

Feedback in respect of the potential sites in Co. Meath indicated concern that the facility would have on the countryside air in the air which it was noted was the reason why many of the community chose to live in the area.

There was a concern that dangerous pathogens would be released into the atmosphere from biosolids at the facility. One submission referenced unnamed studies that have linked odours from general waste facilities (not biosolids storage facilities) to serious health conditions including cancer.

It was noted that as the potential sites in Co. Meath are already in an agricultural area where local residents experience odours from crop spraying, it would be unfair to compound this by the addition of a biosolids storage facility.

Feedback queried how odour would be monitored on an ongoing basis at the proposed facility.

2.7.2 Health

Health concerns in respect to the storage of biosolids were raised in respect of land spreading of biosolids. The EPA research report *Health and Water Quality Impacts Arising from Land Spreading of Biosolids (2017)* was referenced as stating that while any health risks of land spreading were negligible for healthy individuals, care was required for immunocompromised individuals. This can include young children, pregnant women, the elderly and people suffering from medical conditions. As a result, it was felt that the storage facility should not be located within close proximity of childcare facilities with the Grian na nÓg crèche being referenced specifically in respect of the potential site at Greenogue.

Questions were raised in feedback regarding the impact on health that odours / air pollution could cause. The effect of this on various health conditions including pulmonary disease was queried.

The North-East Region of the Health Service Executive (HSE) made a submission to Irish Water as part of the consultation period. The detailed submission presented an overview of the current situation in Ireland in respect of biosolids, how they are produced and managed, why the new storage facility is required and examines the impact on human health of biosolids storage to the general population. The report examined the hazard identification pathway used at source, the pathway, the receptors and the consequence. Some of the key points raised in the submission are summarised below.

> The submission examined the risk to human health by adapting scenarios used by the US Environmental Protection Agency (EPA). Examining two of the five potential sites identified in the Stage 2 Report, it was suggested that the full risk to human health and environment could not be clarified at this preliminary stage of the project due to the limited information available so early in the process. It was noted however, that the proximity of the potential sites to pharmaceutical companies could mean that a loss of containment at the facility or in transit could potentially introduce a risk that could go beyond the region of the facility.
>
> The submission recommended the introduction of measures to reduce the risk of an impact to human health and noted four basic guideline areas for biosolids as being: contaminant controls; pathogen and vector attraction reduction; management controls; and sampling and monitoring. The importance of continuing to engage with all relevant stakeholders as the project progresses was noted.
>
> The report notes that biosolids are recognised as a product of a consistently high standard, which can be used safely and beneficially in agriculture provided that defined standards of quality are reached and by controlling the rates of biosolids produced and how it is utilised.
>
> Clarifications on the specific sites examined were requested in respect of the following areas:
>
> - The risk of loss of containment of biosolids at the facility, that might lead to:

    - Contamination of ground or surface water supplies;
    - Release of biosolids into non-agricultural lands; and
    - Release of odours from biosolids into the air.
- The surveillance and monitoring mechanisms in place to determine the impact to human health and environment; and
- The risks for storage of biosolids in the facility long-term;
- The provisions to be put in place for the safe movement of biosolids from the facility to other facilities for further use; and
- Will an external emergency plan be developed, and will the HSE (including Public Health) be invited to participate.

Some general considerations in respect of any potential site were provided:

- Is there a plan on how the excess biosolids will be utilised? This is relevant, as there will be a saturation threshold for use of biosolids in agriculture;
- It should be determined if there are outlets and infrastructure for the safe use of these projected increased levels of biosolids;
- Clarification on security protocols (i.e. pathogenic, environmental, and structural) for the facility, to reduce the accidental or malicious loss of integrity of the biosolids storage;
- Outline the surveillance mechanisms for the reporting of common, and emerging pathogens that can be found in waste water;
- Determination of reporting protocols for pathogenic exceedances and responsibility for remediation;
- Explain the mechanisms that have been put in place to reduce odour and vector nuisance associated with biosolids decomposition; and
- Determine if any application restrictions will be put in place around the facilities, to reduce potential for residential development.

2.7.3 Soils, Geology & Hydrogeology

Feedback was given in respect of the proximity of the potential sites at Kilshane in Fingal to the nearby Roadstone quarry where blasting takes place on a regular basis. The impact of the ground borne noise and vibrations from the quarry on the facility was referenced as a concern.

The soils type at the potential site at Greenogue was noted as being undesirable and susceptible to flooding.

2.7.4 Water

Feedback in relation to the Greenogue site referenced the proximity to a stream which was felt would be at risk of contamination in the event of a spillage at the site. In addition the site has been identified in a CFRAM mapping exercise as including an area of flood risk which it was felt made the site less desirable as a location for the biosolids facility, even with the use of mitigation measures.

It was suggested in feedback received that flooding had occurred in 2002 and 2011 at the potential site at Greenogue. Flooding continues to be a regular issue for some residents of Peamount Road. It

was also highlighted that an old drainage pond or sink hole is to be found in the area of the potential site.

Concern was raised that the storage of large quantities of biosolids could contaminate nearby water courses and the water table. In relation to the Greenogue site, concern regarding an impact on the nearby canal was raised and it was suggested that Irish Water consult with Waterways Ireland.

In their submission, Inland Fisheries Ireland (IFI) indicated that they had no location preference in respect of the shortlisted sites and provided some general and site specific observations and comments as below. In addition, IFI noted the publication of their updated guidelines for construction works being carried out near waterways.

General:

Pre-construction baseline data (biotic and abiotic) is essential within the EIA process. Potential impacts (likely and significant effects) of the development on the potential systems should be comprehensively assessed and recommendations and mitigation measures should be formulated. The identification of good baseline data across a range of sites, both close to the development and at a distance from the site will allow for comparison between the current situation and that which may develop over time if development proceeds.

Best practice should be implemented at all times in relation to any activities that may impact on surface water (stream, river,) or riparian habitats. Any discharges to surface streams present on the potential site must not impact negatively on the salmonid status of the system. Comprehensive surface water management measures must be implemented at the construction and operational stage to prevent any pollution of local rivers and streams. Silt fencing of discharge streams would also be recommended during construction.

Bracetown/Gunnocks & Gunnocks, Co. Meath:

These potential development sites would be located within the catchment of the Pinkeen River (an important spawning tributary of the Tolka) which flows into Tolka River, a salmonid system. The Tolka in the area of the proposed development site is under immense environmental pressure. As of 2013 the EPA scored a moderate status (Q3) in its biological quality rating. Further downstream at Mulhuddart it received a bad ecological status (Q2), stating that there is unsatisfactory poor ecological conditions in that area of the Tolka in 2015. This was a deterioration in conditions recorded in 2010. IFI consider the upper Tolka at this location has limited available assimilative capacity.

Greenogue, Co. Dublin:

The potential development would be located within the catchment of the Griffeen River which contains a population of brown Trout and Sea Trout are also in the system from the N4 crossing downstream to its confluence with the River Liffey. The River Liffey is exceptional in the area in supporting Atlantic salmon (Salmo salar, listed under Annex II and V of the EU Habitats Directive) and Sea trout (Salmo trutta) in addition to resident Brown trout (Salmo trutta) populations. This highlights the sensitivity of local watercourse and the Liffey catchment in general.

Newtown/Kilshane & Kilshane, Dublin 11:

The proposed developments are within the catchment of the Ward River, an important salmonid system. The Ward River is exceptional among rivers in the area in having resident salmon and sea trout populations, underlying the sensitivity of this particular watercourse and the Ward catchment in general. Electrofishing surveys carried out by IFI in the past found a significant population of juvenile salmon in the lower reaches of the Ward around Swords. Sea trout have been found in the Ward upstream of Coolatrath Bridge in the Lower Ward area. Poor ecological conditions continue in the upper and lower reaches of the Ward River in 2014, according to the EPA.

Feedback highlighted a flooding issue that was caused near the potential sites in Co. Meath by the construction of the M3 motorway. This continues to cause difficulties for residents who highlighted their concern that the presence of the biosolids facility nearby could exacerbate this issue.

In respect of the potential sites at Kilshane in Fingal, it was noted that flooding has occurred in the field behind the Dogs Trust and at the slip road coming off the M2 motorway.

Concern was raised in respect of spillage, drainage over flow and truck washing at the biosolids storage facility and how this could affect local streams. In relation to the potential sites in Co. Meath, it was noted that a stream flows from north to south across these sites. It was cited as a concern that trucks leaving the facility on a wet day would invariably bring biosolids out on their wheels and that should these be washed, the run-off could contaminate local water courses.

The effect of the biosolids storage facility on ground water was also registered as a concern and the difficulty in managing run-off was cited. It was felt this could have a detrimental effect on farm wells.

It was noted in feedback that, as the potential sites in Co. Meath are not served by the wastewater network, provision including financial, would have to be made on these sites for wastewater treatment for internal use.

2.7.5 Visual Impact

Due to the scale of the facility, the impact on the view from the N7 on approach to Dublin was felt to be an impact in respect of the potential site at Greenogue.

The visual impact of the facility at the potential sites in Co. Meath was referenced as a concern due to the physical scale of the storage facility on the surrounding areas of Bracetown, Bennetstown, Pace and Gunnocks.

It was highlighted that screening and landscaping at the facility will be very important to making the plant fit-in from a visual perspective.

2.7.6 Noise

Noise pollution from trucks entering and leaving the facility as well as from operations at the storage facility was a concern noted in feedback provided. This was particularly referenced for the setting of the potential sites at Kilshane in Fingal.

A stakeholder living in proximity to the potential sites in Fingal requested a noise impact study be carried out. It was felt that noise in the area from the airport and M2 motorway would only be worsened by the introduction of the storage facility. Another stakeholder living adjacent to the Kilshane site noted the noise impact from, not only the operation phase of the facility (which would include trucks and loading/unloading machinery) but also the construction phase, as a serious concern. It was noted that other potential sites identified by the selection process did not have as many houses in close proximity as this potential site has.

2.7.7 Archaeology

Feedback was provided in respect of archaeology at the potential sites in Co. Meath. The recent construction of the M3 motorway on nearby lands unearthed a number of historic sites. It was also noted that Gunnocks House and Normansgrove House are listed as historic properties by Meath County Council and it was noted that this designation includes the farm buildings and surrounding parkland as well as the house itself. The tree line avenue and woodland at Gunnocks house was planted approximately 150 to 200 years ago.

2.8 TRAFFIC

Traffic was referenced as a key concern by stakeholders at each of the potential sites listed in the Stage 2 Report. In addition to the number of truck movements arising from the facility on an ongoing basis, concern relating to the impact of increased movements when material is being removed for land spreading was also referred to. Additional trucks on the roads were referenced as contributing to increased exhaust emissions, potential odours and an additional health & safety hazard within communities.

At the Greenogue site, the pre-existing high levels of traffic were referenced on the local roads surrounding the potential site by numerous stakeholders. In particular, there are high levels of Heavy Goods Vehicles (HGV) currently in the area due to the industrial/commercial activities being carried out at Greenogue and Aerodrome Business Park and other sites. The proposed entry and exit points from the N7 (including the Fitzmaurice Road exit) were cited as being overloaded at current levels and that the addition of further HGVs to these roads was not sustainable. The N7 slip road and bridge across the N7 were specifically referenced as a key concern with respect to existing traffic levels. The bridge crossing the N7 was also referenced as a concern in respect of its structural strength to accommodate additional HGV traffic to and from the facility.

Traffic at morning and evening rush hour times in the vicinity of Greenogue was thought to have the biggest potential impact with journey times for commuters already taking longer than is desirable. The congestion levels on the R120 were referenced as a concern with the roundabouts on this road noted as being particularly congested. Feedback indicated that the Greenogue site could not be

used unless additional road infrastructure was to be provided and this was seen as a negative when compared to other potential sites. Other feedback received referenced the additional measures (traffic lights) that have had to be installed in the Rathcoole and Saggart area to relieve the existing high levels of traffic.

The risk of spillages of biosolids material from trucks going to and from the potential site at Greenogue was referenced as a concern. In addition, the proximity of the envisaged haul route takes HGVs close to population centres, such as the village of Rathcoole and a high amenity part of the area was also noted. The impact of additional traffic on pedestrians and cyclists in the area was referenced as well as that on users of the public park in Rathcoole and those walking to and from the park.

The distance of the journey from the Ringsend Wastewater Treatment Plant (WwTP) to the Greenogue site was referenced as putting additional pressure on Dublin's congested road network and that a closer site that resulted in a shorter journey time would be preferable.

Concern was raised regarding the volume of traffic that already exists on the R135 and R108 [road to Kilshane Cross from St. Margaret's] close to the potential sites at Kilshane in Fingal. It was felt that these roads are in poor condition and heavily congested and that further trucks to and from the facility would exacerbate this matter for local residents. It was noted that the R108 is narrow and congested with HGV movements going to and from the Panda Waste facility among other industrial sites in the area. Previous accidents involving HGVs were cited as having occurred on these roads. The bridge was felt to be very narrow for HGVs to pass each other and one stakeholder noted that the bridge was a protected structure. Further feedback noted that large tail-backs of up to a mile could regularly be seen on Kilshane Road from Kilshane Cross to beyond Bay Lane and similar tail-backs could be found on the approach to the Kilshane Cross from the St. Margaret's direction. Photos of these tail backs were provided to illustrate the very heavy traffic volumes experienced on these roads.

It was noted that stakeholders attending the open day in Kilshane were advised of figures in relation to truck movements that were at odds with information that other attendees were provided with at the event. Further clarity on this was requested and further information on the specific numbers of trucks entering and existing the facility were requested.

Feedback was provided in respect of the road from Kilshane Cross to the potential site at Kilshane in Fingal. It was noted that Fingal County Council had instructed traffic going to and from the nearby Roadstone quarry to not use a section of this road as it considered too dangerous for HGVs. It was stated that this must be confirmed by Irish Water with the local authority. It was also noted that this road has a 3 tonne weight limit as sign-posted at its entrance from the old N2 Ashbourne Road at Kilshane Cross. As a result, traffic to a number of industrial facilities are using alternate routes, including the Coldwinters cul-de-sac and this is causing a considerable negative impact on residents at this location.

The T-junction on the R135 and M2 slip road at the Dogs Trust facility in Kilshane was cited as being an extremely dangerous junction with regular traffic incidents. The junction is also susceptible to flooding and no action has been taken to correct this. It was felt that this junction, together with the junction at Kilshane cross must be upgraded before any development could take place in the area. It was also noted that any new entrance off the Kilshane Road would cause traffic issues at the already heavily congested Kilshane Cross.

The lack of footpaths along the roads neighbouring the potential sites in Fingal were cited as a concern and a serious hazard for pedestrians if more trucks begin to use these roads.

The Kilshane Road was cited as being a particularly dangerous road and feedback advised that Irish Water should consult Gardaí as to the number of accidents that have occurred on the road in recent years. The number of houses along this road in very close proximity to the potential site would be severely impacted by the development. The narrow bridge and blind corner were highlighted as particularly dangerous features for HGVs.

A concern was raised in respect of the potential site at Greenogue that the haul route that would be used by trucks entering and leaving the storage facility will impact pedestrians, especially children who are walking to near-by schools. A concern was highlighted about the addition hazard trucks would cause to children when they are crossing these roads. Proximity to the local school (300 meters as the crow flies) and the only pedestrian footbridge between Newcastle and Rathcoole were cited as additional concerns for children walking to school.

Feedback from residence living in proximity to the potential sites in Co. Meath referenced the high traffic volumes from the Shire plant, Avoca and the Kilsaran facility and noted that the biosolids facility would only add to the traffic volumes in the area. The impact during the construction of these properties was also referenced and the impact of further traffic from the storage facility was a concern.

It was noted in feedback that the longest journey time from Ringsend (where most biosolids to be stored at the facility will be produced) is the potential site at Greenogue while the potential sites in Fingal are the closest. This was noted as making the Greenogue site less desirable as a location for the facility.

Queues and tailbacks entering and exiting the M3 motorway at peak times were cited as a concern in respect of the potential sites in Co. Meath. Existing traffic on the R147 was also noted. It was felt a traffic survey should have been completed in advance of publishing potential sites.

The quality of the trucks that will be used to transport biosolids to and from the facility was queried.

A concern was highlighted regarding an existing facility that has been conditioned to use certain haul routes which they are not using. The haul routes to be used to and from the biosolids facility must in determined and strictly adhered to.

Feedback noted that the use of the congested junction 5 of the M3 motorway to transport biosolids to the potential sites in Co. Meath would add considerably to the journey time. It was felt that this was at variance with Irish Water's objective to reduce potential for disruption from sludge transport and sludge facilities.

2.9 OPERATION OF THE FACILITY

Questions surrounding the operation of the facility were raised in the feedback with stakeholders concerned as to whether Irish Water would operate the facility or a third party contractor. Further questions were raised as to the level of independent oversight and monitoring that the facility and the surrounding environment will receive.

The risk of fire at the facility once built was referenced as a concern by stakeholders. It was felt that the material was susceptible to igniting and causing smouldering fire that would be difficult to extinguish. This risk was noted as being especially relevant in winter months when the facility would contain larger quantities of the material. The impact of the pollution that would be caused by a fire on the neighbouring environment and the people near-by was cited as a concern in addition to the hazard caused by the fire itself.

Feedback provided stated that the proximity of the potential site at Greenogue to Casement Aerodrome could result in costly mitigation measures being required, adding to overall cost of the project. It was suggested that Irish Water should contact the Defence Forces in relation to the project and how its operations could impact the aerodrome at Baldonnel. This was highlighted in respect of the passing overhead of helicopters and runway flight paths and height restrictions that may apply. It was also noted that wind studies had been carried out in the area and these would be available from Baldonnel Weather Station.

Concern was raised in respect of the potential sites at Kilshane in Fingal as to how the storage of biosolids may attract birds which could pose a safety risk for operations at nearby Dublin Airport. A similar concern was raised in respect of the flight path that passes near to the potential sites in Co. Meath. It was suggested that Dublin Airport be contacted in relation to proximity to flight paths.

As part of their submission, Portmarnock Community Association suggested that screen planting of native trees and shrubs should be put in place at the facility to minimise the visual impact. It was also suggested that any upgrades required to local roads to accommodate heavy goods traffic should be carried out.

The operating hours and the construction phase operating hours were highlighted as a concern and stakeholders requested that these be clarified.

It was queried whether the facility would be operated by Irish Water or a third party contractor. The ongoing monitoring of activities during the operational phase was of importance to a number of stakeholders.

Possible interference from the storage facility with television reception in the neighbouring area was noted as a concern for one stakeholder.

Feedback questioned how the internal HGV speed limit at the facility will be policed and the penalties that will be in place for those who breach it.

Possible further development at the facility, once operational, was referenced as a concern by some stakeholders.

2.10 COMMUNICATION & CONSULTATION

It was requested in feedback that the project reports continue to be made publicly available and include an outline of the submissions and observations made by members of the public.

It was felt that the level of engagement on the project to date has been low and that more should be done to advertise information events to local residents. Some stakeholders queried the steps taken to notify those living close to the potential sites and some stakeholders noted that the venue for the open day near the potential site at Greenogue was difficult to find. It was suggested that nearby residents should be written to or a flyer issued so as to make people aware of the proposals. It was also noted that it is important for Irish Water to ensure that all local residents are given the opportunity to participate in the consultation process and are presented with a full and frank picture of what is being proposed. Later finish times for open days as well as additional open days were requested in some areas to facilitate a higher level of engagement. In Fingal it was suggested that notice should have been given to the local church so as to inform the community about the project and the open day that was held.

Feedback indicated that stakeholders were happy to have been given an opportunity to have their voices heard at this early stage, before key decisions in respect of a preferred site are made.

Feedback indicated that more information could be provided on the risks associated with the land spreading of biosolids.

An affected landowner indicated their dissatisfaction with only being contacted one day before the sites were published. Other feedback indicated surprise that private property would be identified as a potential site prior to gaining consent from the land owner.

Queries were raised regarding the level of engagement that took place with elected representatives about the project.

One stakeholder requested that information on the project be made available in the Irish language as well as in English.

A concern was raised in respect of consultation reporting that individual submissions would be published in full and that private feedback would be made public.

3 NEXT STAGES OF THE PROJECT

The feedback received as part of this period of public consultation has been reviewed by the project team and the feedback and issues raised will inform the development of the Stage 3 Report. Queries raised will be addressed by the project team through the Stage 3 Report and in subsequent project reports, in lieu of individual responses being issued.

Irish Water would like to thank all those who submitted feedback as part of the focussed period of public consultation on the Stage 2 Report. Engagement with the project team is encouraged at any stage of the project and the information service (phone, email and postal address) will remain in place until a planning application is submitted.

The Stage 3 Report will identify a preferred site for the Regional Biosolids Storage Facility and the report will be subject to a further focussed period of public consultation when it is published in autumn 2017. All stakeholders will have the opportunity to provide feedback on the preferred site as part of this consultation and in advance of the project team preparing a planning application.

As per the project roadmap (**Figure 1.1**), once a planning application has been submitted to An Bord Pleanála, a statutory consultation will be conducted in line with the requirements of the relevant planning legislation.

APPENDIX A1

Stage 2 Advertisement

Regional Biosolids Storage Facility for Greater Dublin

Information days

Irish Water has published details of five potential sites for a Regional Biosolids Storage Facility for greater Dublin. Two are outside Dunboyne, County Meath; two are at Kilshane, North County Dublin; and the fifth one is at Greenogue, South County Dublin.

Biosolids are the end product after our wastewater has been safely treated. Biosolids may be applied as organic fertilisers in agriculture each Spring and Autumn. For the rest of the year they need to be stored. The new storage facility will help support the continued social and economic development of greater Dublin.

As part of a five week public consultation on the five potential sites, we are holding **information days in Dublin and Meath**.

Following this round of consultation, one preferred site will be identified and we will hold a further round of public consultation later this year.

If you would like to know more or have questions, please come along:

- **Monday 22 May, The Oak Centre,** Dunboyne, Co. Meath, from **1pm-7pm**
- **Wednesday 24 May, Citywest Hotel,** Saggart, Co. Dublin, from **1pm-7pm**
- **Thursday 25 May, The White House Hotel,** Newpark, Co. Dublin, from **1pm-7pm**

The consultation period closes on Thursday, 15 June, 2017.

To find out more visit **www.water.ie**

Or contact the project team by:

Email: **biosolids@water.ie**

Phone: **1890 44 55 67**

Safeguarding our water for our future

UISCE ÉIREANN : IRISH WATER

APPENDIX A2

Stage 2 News Release

Irish Water seeks views on shortlisted sites for Regional Biosolids Storage Facility for greater Dublin

New storage facility will form part of wastewater treatment network and facilitate growth

(issued Thursday, 11 May 2017) Irish Water is seeking views on a shortlist of five potential sites for a Regional Biosolids Storage Facility for the greater Dublin region that will help to facilitate social and economic growth.

The population of Dublin and the surrounding counties of Kildare, Meath and Wicklow is growing. So too is economic activity in this region. Having adequate wastewater treatment infrastructure is vital to enable residential and commercial development and to protect the environment.

Biosolids are a treated by-product of the wastewater treatment process. They contain high levels of nutrients and are sustainably reused as an organic fertiliser in agriculture, in compliance with EU and National regulations. Approximately 98% of biosolids produced in Ireland are reused on agricultural land. Biosolids are only applied to lands during the planting seasons each Spring and Autumn. For the rest of the year biosolids need to be stored.

In the coming years, the quantity of biosolids being produced in the greater Dublin region is expected to exceed the currently available storage capacity as new and upgraded wastewater plants are completed to meet the needs of our growing population.

Following further studies and feedback received during a public consultation held earlier this year, Irish Water has identified five potential sites for a new regional biosolids storage facility. Factors taken into account in selecting the sites included whether land was appropriately zoned, the proximity to the relevant wastewater treatment sites and the road network to the sites.

The five potential sites identified are located at:

- Bracetown/Gunnocks, Co. Meath
- Gunnocks, Co. Meath
- Greenogue, Co. Dublin
- Newtown/Kilshane , Dublin 11
- Woodlands/Kilshane, Dublin 11

Further details on each of the identified sites are contained in the Stage 2 Report which is available on the Irish Water website.

Announcing a second round of public consultation for this project, Donal O'Connor, Project Manager, Irish Water said, "Irish Water is focused on a strategic solution to meet projected demand for wastewater treatment within greater Dublin which will benefit the region by facilitating the growth of homes and jobs. This means effectively and efficiently developing and managing our wastewater treatment network. We are upgrading all existing treatment

facilities and adding new wastewater plants and networks to meet future demand within the region. The new Regional Biosolids Storage Facility will be a key part of our future wastewater infrastructure."

The consultation process begins today and runs until **Thursday, 15 June 2017.** Details on the proposed sites and the criteria that will be used to select a preferred site are available at www.water.ie/projects-plans/national-projects/biosolids.

A series of public open days, where the project team will be available to meet with the public and all interested stakeholders and discuss all details of the sites and site selection criteria, will take place as follows:

- Monday 22 May, The Oak Centre, Dunboyne, Co. Meath, from 1pm-7pm
- Wednesday 24 May, Citywest Hotel, Saggart, Co. Dublin, from 1pm-7pm
- Thursday 25 May, The White House Hotel, Newpark, Co. Dublin, from 1pm-7pm

A third non-statutory phase of public consultation will take place on the preferred site once it is identified later this year. The preferred site will undergo all necessary environmental studies and assessments and will be included in the planning applications for both the upgrade of the Ringsend Wastewater Treatment Plant and the proposed new Greater Dublin Drainage project.

Irish Water intends to lodge planning applications for the projects within the next 12 months to An Bord Pleanála. A full statutory consultation process will be held before final decisions are made by An Bord Pleanála.

Further information is available at

www.water.ie/projects-plans/national-projects/biosolids

or by emailing biosolids@water.ie.

ENDS

APPENDIX A3

Stage 2 Newsletter

Regional Biosolids Storage Facility

Stage 2 Public Consultation

May 2017

What is happening?

Irish Water is currently seeking feedback on a project to develop a Regional Biosolids Storage Facility (RBSF) for greater Dublin including parts of Kildare, Meath and Wicklow.

The new biosolids storage facility will form a key part of the upgraded wastewater treatment network for greater Dublin and will facilitate its continued social and economic growth while protecting the environment.

Biosolids are a treated by-product of the wastewater treatment process. They contain high levels of nutrients and are sustainably reused as an organic fertiliser in agriculture, in compliance with EU and National regulations. Approximately 98% of biosolids produced in Ireland are reused on agricultural land. Biosolids are only applied to lands during the planting seasons each Spring and Autumn. For the rest of the year biosolids need to be stored. No further treatment of the material is required and no treatment will take place at the storage facility.

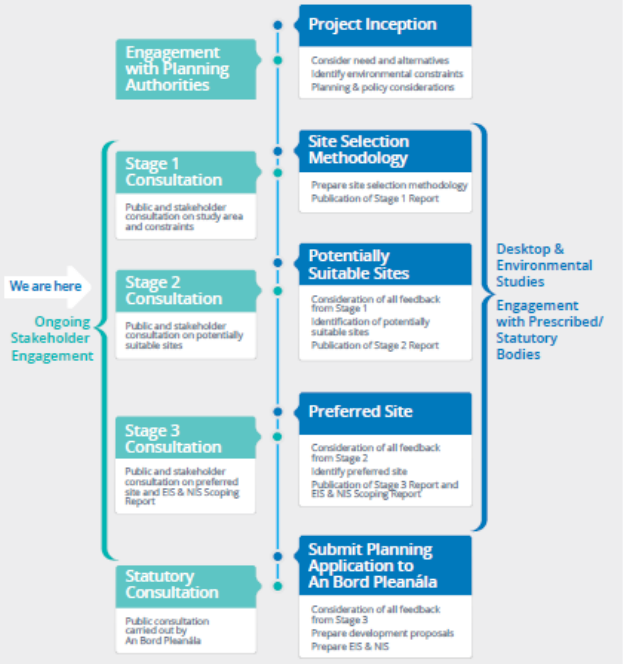
Irish Water published its National Wastewater Sludge Management Plan (NWSMP) in 2016. The plan identified the need to develop a new regional biosolids storage facility to serve greater Dublin and to support the upgrade of Ringsend Wastewater Treatment Plant (WwTP) and the development of the Greater Dublin Drainage project.

Irish Water commenced a three stage public consultation process to identify a preferred site for a Regional Biosolids Storage Facility on 2 February 2017. Following public consultation on the proposed approach to identifying and assessing suitable sites, we are now publishing the Stage 2 Report - Identification of Potential Sites.

The Stage 2 Report identifies a shortlist of five potential sites for the new regional biosolids storage facility. We are now looking for feedback on the sites selected as well as your views on what should be considered as we identify a preferred site. This period of public consultation will run until 15 June 2017.

The project development roadmap below sets out the work carried out to date and the stages that the project team will undertake to bring the project through the planning process.

Regional Biosolids Storage Facility
Project Development Roadmap



Why is this project needed?

The population of Dublin and the surrounding counties of Meath, Kildare and Wicklow is growing. So too is economic activity in this region. With that comes increased need for wastewater treatment facilities so that the treated water can be safely returned to our rivers, lakes and seas. Wastewater is now also being treated to a higher standard which results in larger volumes of biosolids.

In the coming years, the quantities of biosolids produced at Dublin's wastewater treatment facilities will exceed the existing available capacity. A new storage facility must therefore be developed. Increasing wastewater treatment capacity and associated facilities in greater Dublin is vital to meet the demands of a growing population and to support Dublin's future economic growth and development.

Site Selection Methodology

The Stage 2 Report for the RBSF project identifies a shortlist of five potentially suitable sites for the new regional biosolids storage facility.

The report details the process that was followed in order to identify the potential sites. The project team consulted with the planning departments of all of the Local Authorities within the study area. The project team then identified areas of appropriately zoned land within the study area and considered the proximity to the primary sources of biosolids. Existing licensed waste facilities were also considered as were sites proposed during the Stage 1 consultation.

A technical analysis of eight key criteria was then undertaken which identified a shortlist of five potential sites for the new regional biosolids storage facility. The criteria applied were:

- Land Use Zoning
- Size and Configuration
- Proximity to Biosolids Source Sites
- Transportation
- Planning Status & History
- Sensitive Receptors
- Archaeology
- Engineering Feasibility

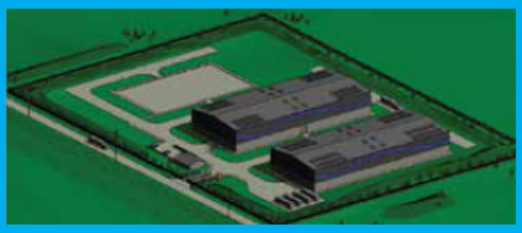
The five potential sites for the new regional biosolids storage facility include two sites outside of Dunboyne in Co. Meath, two sites in Kilshane, Dublin 11 and one site in Greenogue, south Dublin.

It is important to note that the sites identified are located in appropriately zoned areas. Further details on each of the identified potential sites are contained in the Stage 2 Report and available on the project website at www.water.ie/projects-plans/biosolids/.

Biosolids Storage Facility

A site of approximately eight hectares (8ha) will be required for the new storage facility. The detailed design and layout of the facility will be developed to ensure it is suitable for its location when a preferred site is determined. The site will be landscaped and will comprise a number of roofed sheds, similar to modern industrial warehouses, and an administration building.

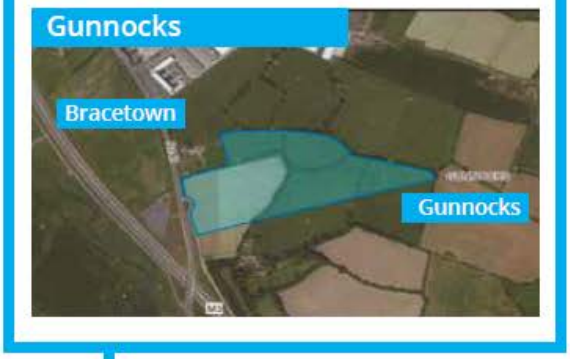
Biosolids will be fully treated at a wastewater treatment plant before being delivered to the storage facility in covered trucks. Biosolids are a low odour material and the storage buildings will be fitted with odour control units. All loading and unloading will take place internally within the enclosed buildings. The only noise impact will be from trucks entering and exiting the facility and from machinery used when loading and unloading the biosolids.



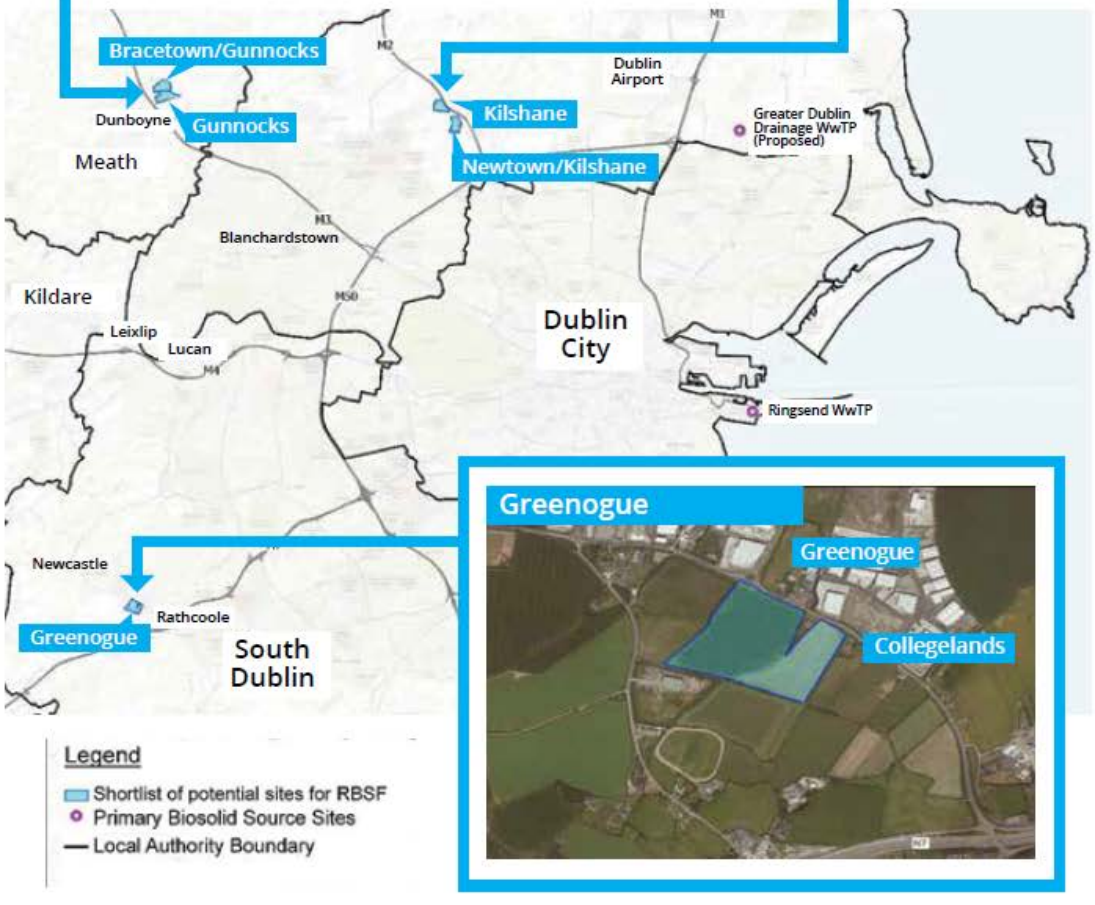
RBSF Indicative Site Layout


Bracetown/Gunnocks
Bracetown
Gunnocks


Kilshane
Kilshane
Newtown


Gunnocks
Bracetown
Gunnocks


Newtown/Kilshane
Newtown
Kilshane
Johnstown


Bracetown/Gunnocks
Dunboyne
Gunnocks
Meath
Kilshane
Newtown/Kilshane
Dublin Airport
Greater Dublin Drainage WwTP (Proposed)
Blanchardstown
Kildare
Leixlip
Lucan
Dublin City
Ringsend WwTP
Newcastle
Rathcoole
Greenogue
South Dublin
Legend
Shortlist of potential sites for RBSF
Primary Biosolid Source Sites
Local Authority Boundary

Greenogue
Greenogue
Collegelands

Next Steps: Selection of the Preferred Site

Following this period of public consultation, the sites identified will proceed to a detailed assessment phase in accordance with a number of criteria proposed in the Stage 2 Report. These criteria include:

- Environmental
- Economic & Engineering
- Planning
- Social & Community

At the next stage of the project, a detailed assessment including walkover surveys at each site will be carried out to enable detailed site investigations. This work will be used to determine which of the potential sites best meets the criteria.

A third non-statutory phase of public consultation will take place on the preferred site once it is identified later this year. The preferred site will undergo all necessary environmental studies and assessments and will be included in the planning applications for both the upgrade of the Ringsend Wastewater Treatment Plant and the proposed new Greater Dublin Drainage project.

Irish Water intends to lodge planning applications for the projects within the next 12 months to An Bord Pleanála. A full statutory consultation process will be held before final decisions are made by An Bord Pleanála.

Open Days

To facilitate participation in the consultation, Irish Water is holding a series of public information events that will take place as follows:

- **The Oak Centre, Maynooth Road, Dunboyne,Co. Meath, Monday 22 May, 1pm-7pm**
- **Citywest Hotel, Saggart, Co. Dublin, Wednesday 24 May, 1pm-7pm**
- **The White House Hotel, Newpark, Co. Dublin, Thursday 25 May, 1pm-7pm**

The information events provide an opportunity to have your say on the project and to get further information about the Regional Biosolids Storage Facility Project.

Public Consultation

We are currently seeking feedback on the five sites identified and the proposed criteria that will be used to select the preferred site. The Stage 2 Report – Identification of Potential Sites has been published and a five week consultation is being held from 11 May 2017 to 15 June 2017.

Irish Water is seeking feedback on the following:

- What do you think of the five potential sites?
- Is there any additional information on the potential sites identified that we should be aware of?
- In addition to the Environmental, Economic & Engineering, Planning and Social & Community criteria set out to select a preferred site, are there any other factors you think should be considered in choosing the preferred site?
- How would you like Irish Water to communicate with you as the project progresses?

The Stage 2 Report – Identification of Potential Sites can be viewed on the project website at www.water.ie/projects-plans/biosolids/. Hard copies are available for viewing at Irish Water's offices at Colvill House, Dublin 1 and at planning counters and county libraries in Fingal, South Dublin, Dublin City, Dun Laoghaire Rathdown, Meath, Kildare and Wicklow.

Have Your Say

Submissions or observations on the project are invited by 5pm on Thursday 15 June 2017:

By phone: **1890 44 55 67**

By email: **biosolids@water.ie**

By post: **Biosolids Consultation, Irish Water, Colvill House, 24-26 Talbot Street, Dublin 1, Ireland.**

APPENDIX A4

Stage 2 Correspondence

11th May 2017

Regional Biosolids Storage Facility for greater Dublin

Good morning,

Irish Water is seeking views on a shortlist of five potential sites for a Regional Biosolids Storage Facility for greater Dublin, including parts of Kildare, Meath and Wicklow. The new biosolids storage facility will form part of the upgraded wastewater treatment network for greater Dublin and will facilitate its continued social and economic growth while protecting the environment.

A five week non-statutory public consultation begins today, and will run until 15 June 2017. We are inviting all interested parties to make submissions on the potential sites for the new biosolids storage facility and the criteria that will be used to select a preferred site later this year.

Biosolids are a treated by-product of the wastewater treatment process. They contain high levels of nutrients and are sustainably reused as an organic fertiliser in agriculture, in compliance with EU and National regulations. Approximately 98% of biosolids produced in Ireland are reused on agricultural land. Biosolids are only applied to lands during the planting seasons each Spring and Autumn. For the rest of the year biosolids need to be stored. No further treatment of the material is required and no treatment takes place at storage facilities.

In the coming years, the quantities of biosolids produced at Dublin's wastewater treatment facilities will exceed the existing available capacity. A new storage facility must therefore be developed. Increasing wastewater treatment capacity and associated facilities in greater Dublin is vital to meet the demands of a growing population and to support Dublin's future economic growth and development.

Irish Water commenced a three stage public consultation process to identify a preferred site for a Regional Biosolids Storage Facility on 2 February 2017. Following public consultation on the

proposed approach to identifying and assessing suitable sites, we have now published the Stage 2 Report – Identification of Potential Sites.

The five potential sites are at:

- Bracetown/Gunnocks, Co. Meath
- Gunnocks, Co. Meath
- Greenogue, Co. Dublin
- Newtown/Kilshane , Dublin 11
- Woodlands/Kilshane, Dublin 11

It is important to note that the sites identified are located in appropriately zoned areas. Further details on each of the identified potential sites are contained in the Stage 2 report and available on the project website at www.water.ie/projects-plans/biosolids/ along with details of how you can make a submission on the project. Copies of the Stage 2 Report are also available for viewing at Irish Water headquarters in Colvill House, Dublin 1 during office hours, and at public libraries and at public libraries and planning counters in greater Dublin.

We invite you to attend one of our planned public open days, close to the potential site locations. These take place on:

- Monday 22 May, The Oak Centre, Maynooth Road, Dunboyne, Co. Meath, from 1pm-7pm
- Wednesday 24 May, Citywest Hotel, Saggart, Co. Dublin, from 1pm-7pm
- Thursday 25 May, The White House Hotel, Newpark, Co. Dublin, from 1pm-7pm

Following this period of public consultation, the potential sites will proceed to a detailed assessment phase, including walkover surveys at each site. This assessment will be used to determine which of the potential site best meets a range of criteria including environmental, economic & engineering, planning, and social & community.

A third non-statutory phase of public consultation will take place on the preferred site once it is identified later this year. The preferred site will undergo all necessary environmental studies and assessments and will be included in the planning applications for both the upgrade of the Ringsend Wastewater Treatment Plant and the proposed Greater Dublin Drainage project.

Irish Water intends to lodge planning applications for both projects within the next 12 months to An Bord Pleanála. A full statutory consultation process will be held before final decisions are made by the Board.

We welcome your views on the potential sites and on the proposed process to select a preferred site:

- By phone: 1890 44 55 67
- By email: biosolids@water.ie
- By post: Biosolids Consultation, Irish Water, Colvill House, 24-26 Talbot Street, Dublin 1, Ireland

Yours sincerely,

Donal O'Connor

Project Manager

Regional Biosolids Storage Facility Project

Note: You have received this email because you previously registered an interest with Irish Water on one of our projects . If you no longer wish to receive updates on the Regional Biosolids Storage project, you can unsubscribe at any time by emailing biosolids@water.iewith 'Unsubscribe' in the subject line. Otherwise we will continue to update you as the project progresses.

APPENDIX A5

Groups and Organisations Contacted Directly

Directly Contacted
Interested Groups & Organisations
Age Action Ireland
An Taisce
BirdWatch Ireland
Bord Bia
Bord na Mona
CCMA
Chambers Ireland
Citywest B2B
Coastwatch
Commission for Energy Regulation
Confederation of European Waste to Energy Plants
Construction Industry Federation
Consumer Association of Ireland
Cré (Composting Association of Ireland)
Department of Arts, Heritage and the Gaeltacht
Department of Housing, Planning, Community and Local Government
Department of Jobs, Enterprise and Innovation
Dublin Airport Authority
Dublin Port Company
Dunboyne AC
Dunboyne AFC
Dunboyne Business Association
Dunboyne Castle Residents Association
Dunboyne Community Centre
Dunboyne Friends of the Elderly
Dunboyne Men's Shed
Eastern & Midlands Regional Assembly
Eastern-Midlands Waste Region
Engineers Ireland
Enterprise Ireland
Enva
Environmental Law Implementation Group
Environmental Licensing Programme
Environmental Protection Agency
Environmental Science Association of Ireland
ESB
Fáilte Ireland
Federation of Irish Sport
Food Safety Authority of Ireland
Friends of the Earth
Friends of the Irish Environment
Gas Networks Ireland
Gormanston Community Association

Directly Contacted
Green Foundation Ireland
Health & Safety Authority
Higher Education Authority
HSE
Ibec
ICMSA
IDA
Indaver Ireland
Inland Fisheries Ireland
Irish Co-Operative Organisation Society
Irish Dairy Industry Association
Irish Doctors Environmental Association
Irish Environmental Association
Irish Environmental Network (IEN)
Irish Farmers Association
Irish Grain & Feed Association
Irish Grain Growers Association
Irish Seed Trade
Irish Waste Management Association
Irish Wildlife Trust
ISME
MABS
National Disability Authority
National Federation of Group Water Schemes
National Parks & Wildlife
National Transport Authority
National Youth Council of Ireland
Public Water Forum
Rathcoole Community Centre
Rathcoole Community Council
Restaurant Association of Ireland
Small Firms Association
St. Peters GAA
St. Vincent de Paul
Sustainable Ireland
SWAN
Teagasc
The Arts Council
The Competition & Consumer Protection Commission
The Environmental Pillar
The Heritage Council
The Oak Centre
The Wheel
Transport Infrastructure Ireland

Directly Contacted
Voice of Irish Concern for the Environment
Waterways Ireland
Zero Waste Alliance
Local Authorities
Carlow County Council
Dublin City Council
Dun Laoghaire Rathdown County Council
Fingal County Council
Kildare County Council
Meath County Council
South Dublin County Council
Wicklow County Council

Appendix B RBSF Design & Land Requirements

Size of Facility Required

The RBSF is ultimately planned to serve the needs of greater Dublin to the year 2050, which is anticipated to be based upon approximately 3.6 million PE. However, Irish Water intends to apply to An Bord Pleanála for planning approval for the development of the facility based on a design horizon of 2040, which is 3.0 million PE.

Deliveries of biosolids from the WwTPs within the region would occur throughout the year, however removal of biosolids from the RBSF would happen particularly during spring and autumn periods. Assuming that biosolids would need to be stored for a maximum of 4 to 5 months per year (to allow for periods of wet weather either side of the statutory prohibition on land spreading from October to January), the likely maximum storage requirement would be in the region of 48,000 m^3 per annum. Assuming an average storage depth of 5m, the storage area required for the maximum expected biosolids quantity would be 9,600 m^2. Allowing for HGV internal circulation (as all loading and unloading would take place internally) this gives a floor area required of 10,500 m^2. Additional floorspace of some 200 m^2 would also be required for administration, laboratories, stores, and staff welfare facilities. This could be provided in a separate building. Space for odour control units would be necessary, and would be sited adjacent to and external to the buildings.

Site Layout & Operational Requirements

Based on the need outlined above, and for the purposes of presenting a generic layout of the Biosolids Storage Facility for consultation purposes, the total floor space required to accommodate a capacity of 3.0 million PE has been broken down as follows:

- Proposed development – 2 no. buildings (dimensions 50m X 105m) and 1 Administration Building (dimensions 16m X 12m)
- Provision of space on the selected site for future expansion

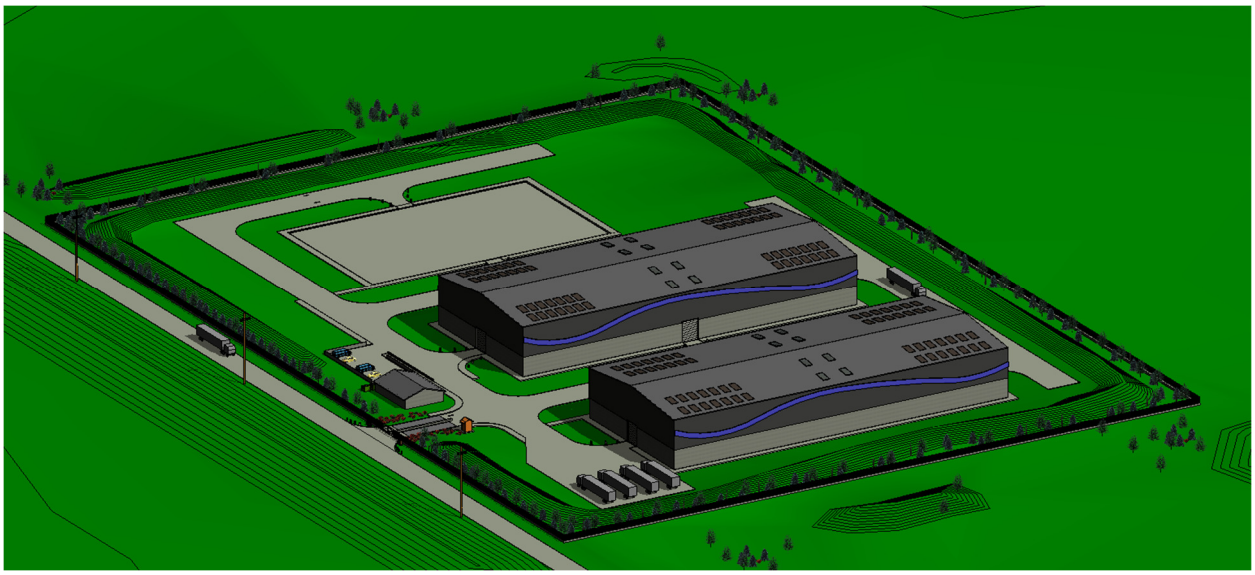
As explained above, the site should be of sufficient size to accommodate possible future expansion to meet the entire 3.6 million PE demand to 2050. Irish Water recognises that any future expansion of the facility to accommodate this additional storage capacity would require planning permission, but considers it prudent to select a site that is capable of accommodating that extra capacity.

When a final site is selected the detailed design of the facility must take into account the particular circumstances and issues relevant to that site and consequently the final proposed design will vary (perhaps quite significantly) from the 'generic' layout presented in this report.

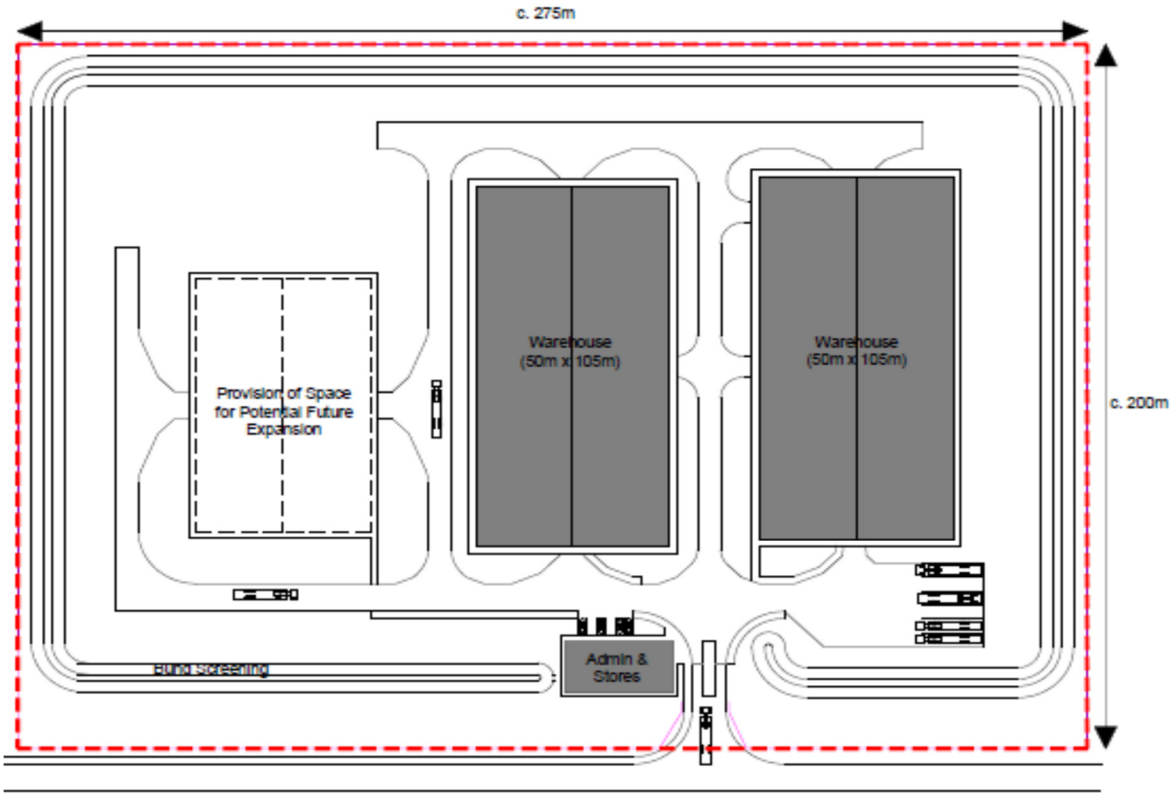
While odours associated with biosolids are low, it is expected that in order to prevent the risk of odours arising at the facility, the proposed buildings would be required to be fitted with odour control units and all unloading and loading of biosolids would be required to take place internally within the storage buildings. All truck (HGV) loads arriving and leaving the facility would be required to be covered. The buildings would operate under negative air pressure (due to air being continuously extracted to odour control units - OCUs) in order to minimise the potential for odour emissions. The odour control units would discharge treated air to the atmosphere via one or more stacks. The number, location and height of the stacks would be selected at detailed design stage to minimise possible impacts on sensitive receptors. These matters have been anticipated in the generic site layout.

For maximum efficiency and to reduce total HGV journeys, articulated HGV tipper units are proposed. These result in a maximum building height to eaves being necessary of 12.5m, which results in a building ridge height of c.15m to cater for load tipping. (Note – only the OCU emission stacks would be higher than the building ridge line).

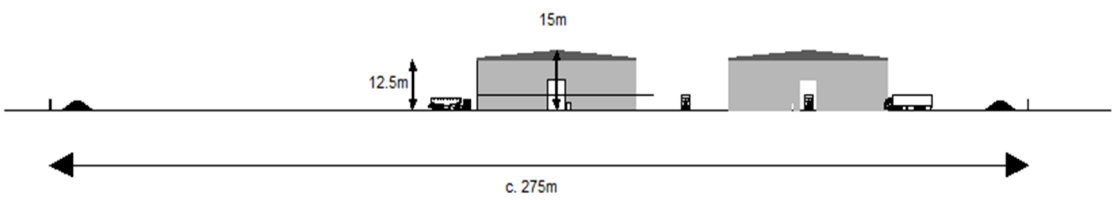
For safety and efficiency reasons one-way HGV circulation within the site is proposed. A landscaped berm is proposed around the site perimeter for screening purposes. Finally, a surface water attenuation tank would be required to limit storm run-off from the site in accordance with regional drainage/flooding policy. This gives the indicative site layout shown below.



Indicative layout of proposed Regional Biosolids Storage Facility



Indicative Plan of Proposed Regional Biosolids Storage Facility



Indicative Elevation of Proposed RBSF

Area Required for Site Selection Purposes

The generic design of the proposed RBSF presented above requires a site area of approximately 5.5 hectares. As it is quite unlikely that such an 'ideally' sized perfectly rectangular site will be located, and to provide layout flexibility and buffering to minimise potential environmental impacts (particularly on sensitive receptors) it is proposed for site selection purposes to seek site locations where a minimum usable area of 8 hectares is available.