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## 9 Noise & Vibration

### 9.1 Introduction

This Chapter has been prepared to assess the potential for noise and vibration effects from the Proposed Development at the Premier Periclase Ltd. (PPL) Site at Boyne Avenue, Newtownstalaban, Drogheda Co. Louth.

This chapter details the current noise levels at the Proposed Development site. It also outlines the predicted noise levels that will be generated due to the operation of the Proposed Development. Background noise monitoring of the site has been used and predictive noise modelling of the proposed on-site activity has been carried out to determine the effect from the Proposed Development on noise levels in the local area.

The potential noise and vibration effects from the proposed demolition and construction activities have also been assessed in this chapter.

Based on the results of the assessments, the necessary noise and vibration mitigation measures are incorporated into the development design, thereby avoiding any adverse effects.

#### 9.1.1 Effects of Noise

While the effects of noise are subjective, it can affect human receivers both behaviourally and physiologically. As described in *Guidelines for Environmental Noise Impact Assessment* (Institute of Environmental Management and Assessment, November 2014), the behavioural affect can be described over three levels of increasing response:

1. Noise disturbance which causes distraction of physically interfering with human activity (speech interference, disruption of work, disruption of mental ability, sleep disturbance);
2. Noise disturbance can be experienced as annoyance (or an indirect response to the first level of physical disturbance) and;
3. Overt reaction (complaints).

#### 9.1.2 Effects of Vibration

Vibration is a related issue that can also adversely affect people and structures in the vicinity of a vibration source. Humans can perceive vibration at levels of low magnitude, typically from 0.14 mm/s to 0.3 mm/s. At vibration levels greater than this and similarly to noise, vibration can cause the same levels of response such as distraction, leading to annoyance and disturbance. Greater levels of vibration (a minimum of 15 mm/s) are required to cause structural damage.

## 9.2 Assessment Methodology

### 9.2.1 General

In order to assess the potential effects of noise from the Proposed Development on the surrounding area, sound pressure levels were assessed (either through measurement or prediction) for the following development phases:

- Pre-development phase – current sound pressure levels at nearby noise sensitive locations (NSLs)<sup>98</sup> were measured to provide background baseline data to which predicted future noise levels for the area can be compared. A noise survey was performed and this was used to provide baseline noise levels for day, evening and night-time periods (existing baseline scenario). As discussed in *Chapter 1 Introduction* of this EIAR, the site is currently licensed with the EPA and therefore annual noise monitoring of the site environs is carried out. Details of this

<sup>98</sup> Noise Sensitive Locations (NSLs) as defined by the EPA as “any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels” (Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4), EPA 2016)

noise monitoring has also been provided in this chapter (operational baseline scenario). Refer to Section 9.3 of this EIAR for more details on the description of the baseline scenarios.

- Construction phase (including demolition) – potential sound pressure levels and associated effects arising from demolition and construction activities were considered, in order to determine sufficient noise mitigation measures for the construction phase. Potential vibration effects during the demolition and construction activities were also assessed. Refer to Sections 9.2.3 – 9.2.5 for more details on the standards and guidelines used as part of the construction phase assessment.
- Operational phase – sound pressure level emissions from future site operations were predicted in order to predict the effects on the existing noise levels in the environment in terms of licence compliance and subjective effects. The model results were compared to the ambient baseline noise levels to assess the effects of the Proposed Development, and to determine appropriate mitigation measures as required. Refer to Sections 9.2.6 – 9.2.8 for more details on the standards and guidelines used as part of the operational phase assessment.

### Measurement Parameters and Terminology

Sound pressure is measured in terms of decibels (dB). The various measurement parameters and noise terminology are defined below:

- **Decibel (dB)**  
Decibel (dB) is the standard unit for expressing the noise level (sound pressure level). It is calculated as a logarithm of the intensity of sound. It is derived from the logarithm of the ratio between the value of a quantity and a reference quantity. For sound pressure level the reference quantity is  $20\mu\text{Pa}$  which is the threshold of normal hearing and equates to 0dB. At the upper end of the scale 140dB is the threshold of pain.
- **Weighted Decibel (dB(A))**  
Decibels measured on a sound level meter incorporating a frequency weighting (A-weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. This takes account of the fact that the human ear has different sensitivities to sound at different frequencies.
- **$L_{\text{eq}}$  (dB)**  
The equivalent continuous sound level – the sound pressure level of a steady sound having the same energy as a fluctuating sound over a specified measuring period. It can be considered similar to an average level. The  $L_{\text{Aeq}}$  value is the A-weighted  $L_{\text{eq}}$ .
- **$L_{\text{A90}}$  and  $L_{\text{A10}}$  Values (dB(A))**  
The  $L_{\text{A90}}$  and  $L_{\text{A10}}$  values represent the A-weighted sound pressure levels exceeded for a percentage of the instrument measuring time. The  $L_{\text{A90}}$  represents the sound pressure level exceeded for 90% of the monitoring period and is a good indicator of the background noise level excluding peak noise events.  $L_{\text{A10}}$  indicates the sound pressure level exceeded for 10% of the monitoring period and is a good parameter for expressing event noise such as passing traffic.
- **$L_{\text{Amax}}$  (dB(A))**  
The maximum instantaneous value recorded over the monitoring period including A-weighting.
- **$L_{\text{Ar,T}}$  (dB(A))**  
The Rated Noise Level, equal to the  $L_{\text{Aeq}}$  during a specified time interval (T), plus specified adjustments for tonal character and/or impulsiveness of the sound.

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#### - **Tonal Noise**

According to the EPA NG4 Guidance Note, Section 5.1<sup>99</sup>, a tone can be objectively identified where the time-averaged sound pressure level in the one-third octave band of interest exceeds the time-averaged sound pressure levels of both adjacent one-third octave bands by a constant level difference.

The appropriate level differences vary with frequency. They should be greater than or equal to the following values in both adjacent one-third octave bands:

- 15dB in low-frequency one-third octave bands (25Hz to 125Hz);
- 8dB in middle-frequency one-third octave bands (160Hz to 400Hz), and;
- 5dB in high-frequency one-third octave bands (500Hz to 10,000Hz).

#### - **Impulsive Noise**

A noise that is of short duration (typically less than one second), the sound pressure level of which is significantly higher than the background e.g. hammer blow to metal sheet.

### 9.2.2 **Relevant Guidance**

The assessment of the potential effects of the Proposed Development in relation to noise and vibration was carried out according to the methodology specified in the following guidance documents:

- Environmental Protection Agency (EPA) (2022) "*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*";
- Environmental Protection Agency (EPA) (2016) "*Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*";
- British Standards Institute (2014) "*BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1 – Noise*";
- British Standards Institute (2014) "*BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2 – Vibration*";
- British Standards Institute (2019) "*BS 4142: 2014+A1:2019: Methods for Rating and Assessing Industrial and Commercial Sound*";
- Design Manual for Roads and Bridges (DMRB) (2020) "*LA 111 Sustainability & Environmental Appraisal. Noise and Vibration Rev 2, Highways England*";
- Department of Transport and Welsh Office (1988) "*Calculation of Road Traffic Noise*";
- International Standards Organisation (1996) "*ISO 9613-2: 1996 Acoustics -Attenuation of sound outdoors- Part 2: General Method of Calculation*";
- International Standards Organisation (2017) "*ISO 1996-2:2017 Acoustics – Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels*";
- Transport Infrastructure Ireland (2014) "*Good Practice for the Treatment of Noise During the Planning of National Road Schemes*";
- Institute of Environmental Management and Assessment (IEMA) (2014) "*Guidelines for Environmental Noise Impact Assessment*"; and
- World Health Organisation (WHO) (2000) "*Guidelines for Community Noise*".

<sup>99</sup> EPA (2016). *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*

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### 9.2.3 Assessment of Construction Phase Noise (including Demolition)

There is no statutory legislation or guidance relating to the maximum permissible sound pressure level that may be generated during the construction phase of a project. Planning authorities typically control noise from construction activities by restricting hours of operation and may consider, at their discretion, the imposition of emission limits.

As discussed in *Chapter 1 Introduction* of this EIAR, the current site has an Industrial Emissions Licence, granted by the EPA (Reg. No. P0376-02). The EPA NG4 guidance states “*that the guidance within this document relates to the assessment and measurement of noise in relation to Agency scheduled activities only. The guidance does not relate to construction and/or off-site transportation noise. For any construction related noise, this process is generally covered by the conditions of the planning permission and it does not relate to the licensable activity on site.*”

Best practice limits are available from the Transport Infrastructure Ireland (TII) publication (formerly the National Roads Authority) *Good Practice for the Treatment of Noise During the Planning of National Road Schemes* (March 2014) for permissible construction sound pressure levels at noise sensitive locations (NSLs) during construction of public road schemes. Table 9.1 states the maximum construction permissible levels at the façades of the nearest dwellings as per the TII guidelines.

**Table 9.1:** Maximum Permissible Construction Sound Levels at the Façade of Dwellings

| Days                      | Times       | Noise Levels (dB re. $2 \times 10^{-5}$ Pa) |                 |
|---------------------------|-------------|---------------------------------------------|-----------------|
|                           |             | $L_{Aeq}$ (1 hr)                            | $L_{Amax}$      |
| Monday to Friday          | 07.00-19.00 | 70                                          | 80              |
| Monday to Friday          | 19.00-22.00 | 60 <sup>1</sup>                             | 65 <sup>1</sup> |
| Saturdays                 | 08.00-16.30 | 65                                          | 75              |
| Sundays and Bank Holidays | 08.00-16.30 | 60 <sup>1</sup>                             | 65 <sup>1</sup> |

Note 1: Construction activity at these times, other than that required for emergency works, will normally require the explicit permission of the relevant local authority.

Additional guidance in relation to construction noise is available in Annex E (Section E.3.2) of *BS 5228:1 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise+A1:2014* (British Standards Institute, 2014). Residential sound pressure threshold limits based upon ambient levels are described as the ‘*ABC method*’. Table 9.2 states these threshold limits, which if exceeded, represent a potential significant effect on the dwelling (receiver).

**Table 9.2:** BS 5228-1 Construction Threshold Limits for Residential Receptors

| Assessment category & threshold value period      | Threshold value, (dB $L_{Aeq,T}$ ) |                           |                           |
|---------------------------------------------------|------------------------------------|---------------------------|---------------------------|
|                                                   | Category A <sup>(1)</sup>          | Category B <sup>(2)</sup> | Category C <sup>(3)</sup> |
| Night-time (23.00-07.00)                          | 45                                 | 50                        | 55                        |
| Evenings and weekends <sup>(Note 4)</sup>         | 55                                 | 60                        | 65                        |
| Daytime (07.00-19.00) and Saturdays (07.00-13.00) | 65                                 | 70                        | 75                        |

Note 1: Threshold values to use when ambient noise levels (rounded to nearest 5 dB) are less than these values

Note 2: Threshold values to use when ambient noise levels (rounded to nearest 5 dB) are the same as category A values

Note 3: Threshold values to use when ambient noise levels (rounded to nearest 5 dB) are higher than category A values

Note 4: 19.00-23.00 hrs weekdays, 13.00-23.00 hrs Saturday and 07.00-23.00 hrs Sundays



When considering non-residential receptors, BS 5228-1:2009-A1-2014 Annex E states:

*“Noise levels, between say 07:00 and 19:00 hours, outside the nearest window of the occupied room closest to the site boundary should not exceed:-*

- 70 decibels (dBA) in rural, suburban areas away from main road traffic and industrial noise;
- 75 decibels (dBA) in urban areas near main roads in heavy industrial areas.”

BS 5228-1:2009-A1-2014 Annex F also provides methods for calculating construction noise from site for stationary and mobile plant together with typical sound pressure levels for various plant and machinery associated with construction activities provided in Annexes C and D of the standard.

Taking into account the guidance outlined above and making reference to the existing baseline noise environment monitored around the development site (see Section 9.3.3), the Construction Noise Threshold (CNT) levels proposed for the construction phase of the Proposed Development (including demolitions) are outlined in Table 9.3.

**Table 9.3:** Proposed Construction Noise Threshold Levels for NSLs in this Assessment

| NSL  | Proposed CNT (dB(A))              | Source of CNT                                                                     |
|------|-----------------------------------|-----------------------------------------------------------------------------------|
| NSL1 | 65 <sup>1</sup> / 55 <sup>2</sup> | Category A residential receptor as per BS 5228-1:2009-A1-2014 Annex E (Table 9.2) |
| NSL2 | 75 <sup>1</sup> / 65 <sup>2</sup> | Category C residential receptor as per BS 5228-1:2009-A1-2014 Annex E (Table 9.2) |
| NSL3 | 70 <sup>1</sup> / 60 <sup>2</sup> | Category B residential receptor as per BS 5228-1:2009-A1-2014 Annex E (Table 9.2) |
| NSL4 | 70                                | Limits for non-residential receptors in BS 5228-1:2009-A1-2014 Annex E            |
| NSL5 | 75 <sup>1</sup> / 65 <sup>2</sup> | Category C residential receptor as per BS 5228-1:2009-A1-2014 Annex E (Table 9.2) |

Note 1: Proposed CNT for Monday to Friday 07:00-19:00, Saturdays 07:00-13:00

Note 2: Proposed CNT for Saturdays 13:00-19:00

In order to assist with the interpretation of CNTs, Table 9.4 includes guidance as to the likely magnitude of effects associated with construction activities, relative to the CNT. This guidance is derived from Table 3.16 of United Kingdom Highways Agency (UKHA) *Design Manual for Roads and Bridges (DMRB) Sustainability & Environment Appraisal LA 111 Noise and Vibration Revision 2* (UKHA, 2020) and adapted to include the relevant significance effects from the EPA Guidelines (EPA 2022).

**Table 9.4:** Description of the Magnitude of Effects (Adapted from DMRB Table 3.16)

| Construction Noise Level                      | Magnitude of Effect (DMRB) | EPA Significance of Effect     |
|-----------------------------------------------|----------------------------|--------------------------------|
| Below or Equal Baseline Noise Level           | Negligible                 | Not Significant                |
| Above Baseline and Below or Equal to CNT      | Minor                      | Slight – Moderate              |
| Above Baseline and Below or Equal to CNT +5dB | Moderate                   | Moderate – Significant         |
| Above CNT +5dB                                | Major                      | Significant – Very Significant |

#### 9.2.4 Assessment of Construction Phase Vibration (including Demolition)

There are two types of vibration standards: those dealing with human perception/comfort and those dealing with cosmetic or structural damage to buildings. In both instances, the magnitude of vibration is expressed in terms of Peak Particle Velocity (PPV) in millimetres per second (mm/s).

British standard BS 5228-2: 2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites- Part 2: Vibration* (British Standards Institute, 2014) states that the threshold of human perception being typically in the range of 0.14 mm/s to 0.3 mm/s, with a vibration level of 1.0 mm/s in residential environments are likely to cause complaint. Beyond 10 mm/s, vibration is likely to be intolerable for any more than a brief exposure period.

BS 5228-2: 2009+A1:2014 also outlines transient vibration threshold criteria for cosmetic damage, which are shown in Table 9.5.

**Table 9.5:** Transient vibration guide values for cosmetic damage (BS 5228-2: 2009+A1:2014)

| Type of Building                                                                          | Peak component particle velocity in frequency range of predominant pulse <sup>1</sup> |                                                           |
|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------|
|                                                                                           | 4 Hz to 15 Hz                                                                         | 15 Hz and above                                           |
| Reinforced or framed structures<br>Industrial and heavy commercial buildings              | 50 mm/s at 4 Hz and above                                                             | 50 mm/s at 4 Hz and above                                 |
| Unreinforced or light framed structures<br>Residential or light commercial type buildings | 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz                                        | 20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above |

Note 1 Important buildings that are difficult to repair might require special consideration on a case-by-case basis

The TII guidelines (*Good Practice for the Treatment of Noise during the Planning of National Road Schemes*, 2014) recommend that vibration from road construction activities is limited to the values shown in Table 9.6 and that compliance with these limits should ensure there is little to no risk of cosmetic damage to buildings.

**Table 9.6:** Allowable vibration during road construction in order to minimise the risk of building damage

| Allowable vibration velocity (Peak Particle Velocity) at the closest part of any sensitive property to the source of vibration, at a frequency of; |             |                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------|
| Less than 10 Hz                                                                                                                                    | 10 to 50 Hz | 50 to 100 Hz (and above) |
| 8 mm/s                                                                                                                                             | 12.5 mm/s   | 20 mm/s                  |

The sources of potential construction vibration were assessed based on the proposed construction methodologies and the distances to the nearest vibration sensitive receivers.

### 9.2.5 Assessment of Construction Phase Traffic

There are no specific guidelines or limits relating to traffic related sources along the local or surrounding roads during the construction phase. Given that traffic from the construction of the Proposed Development will make use of existing roads already carrying traffic volumes, it is appropriate to assess the calculated increase in traffic noise levels that will arise because of vehicular movements associated with construction works.

In order to assist with the assessment of construction traffic noise, reference is made to the *DMRB Noise and Vibration*. DMRB has been used to assess the likely magnitude of effects associated with changes in traffic noise levels along an existing road. Table 9.7 presents the likely effects associated with change in traffic noise level and is adapted from Table 3.17 of the DMRB to include a column on the significance of effects in EPA/EIAR terms.

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**Table 9.7:** Classification of Magnitude of Traffic Noise Changes in the Short-term

| Change in Sound Level (dB) | Subjective Reaction        | DMRB Magnitude of Impact (Short-term) | EPA Significance of Effect |
|----------------------------|----------------------------|---------------------------------------|----------------------------|
| Less than 1 dB             | Inaudible                  | Negligible                            | Imperceptible              |
| 1 – 2.9 dB                 | Barely Perceptible         | Minor                                 | Not Significant            |
| 3 – 4.9 dB                 | Perceptible                | Moderate                              | Slight, Moderate           |
| ≥ 5 dB                     | Up to doubling of loudness | Major                                 | Significant                |

### 9.2.6 Assessment of Operational Phase Noise

Operational prediction modelling was carried out using Bruel and Kjaer Predictor software (Version V2023) employing ISO 9613-2: 1996 *Acoustics -Attenuation of sound outdoors- Part 2: General Method of Calculation* (International Standards Organisation, 1996).

#### Industrial Emission Licence Conditions

In order to negate the potential effects from noise, the EPA sets noise emission limits<sup>100</sup> for noise from EPA licensed sites<sup>101</sup> at boundary locations, noise sensitive locations or a combination of both.

The following are the limits included in the site's current Industrial Emissions Licence (Reg. No. P0376-02, dated 4<sup>th</sup> July 2013). These limits apply at the nearby noise sensitive locations (NSLs) agreed between PPL and the EPA (more details on NSL locations provided in Section 9.3.7 of this EIAR).

- Daytime (07:00-19:00): 55dB(A)  $L_{Aeq}$
- Night-time (23:00-07:00): 45dB(A)  $L_{Aeq}$

As discussed in *Chapter 1 Introduction* of this EIAR, an Industrial Emissions licence will also be required for the Proposed Development once it is operational. As the site is not classified as a "quiet area" (see Section 9.3.6), the limits that are expected to be included in the site's revised licence at off-site NSLs in accordance with the EPA's NG4 guidance are as follows:

- Daytime (07:00-19:00): 55dB(A)  $L_{Ar}$
- Evening time (19:00-23:00): 50dB(A)  $L_{Ar}$
- Night-time (23:00-07:00): 45dB(A)  $L_{Aeq}$

#### Guidelines for Noise Impact Assessment

- The Guidelines for Noise Impact Assessment<sup>102</sup> (Institute of Environmental Management and Assessment (IEMA)) are generally recognised as established good practice standards for scope, content, and methodology of noise impact assessment.
- These Guidelines address the key principles of noise impact assessment and are applicable to all development proposals where noise effects are likely to occur. These Guidelines state that for any assessment, the noise level threshold and significance should be determined by the assessor, based upon the specific evidence and likely subjective response to noise. An example impact scale offered by the IEMA guidelines is shown in Table 9.8.

<sup>100</sup> EPA (2016). Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)

<sup>101</sup> WHO (2000). Guidelines for Community Noise

<sup>102</sup> *Guidelines for Environmental Noise Impact Assessment* (Institute of Environmental Management and Assessment, November 2014)

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**Table 9.8:** Example Impact Scale from the Change in Sound Levels (IEMA)

| Long-term Classification | Short-term Classification | Sound level change dB $L_{pAeqT}$ (positive or negative)<br>T = either 16hr day or 8hr night | EPA Significance of Effect |
|--------------------------|---------------------------|----------------------------------------------------------------------------------------------|----------------------------|
| Negligible               | Negligible                | $\geq 0$ dB and $< 1$ dB                                                                     | Neutral                    |
|                          | Minor                     | $\geq 1$ dB and $< 3$ dB                                                                     | Imperceptible              |
| Minor                    | Moderate                  | $\geq 3$ dB and $< 5$ dB                                                                     | Slight                     |
| Moderate                 | Major                     | $\geq 5$ dB and $< 10$ dB                                                                    | Moderate                   |
| Major                    |                           | $\geq 10$ dB                                                                                 | Significant                |

The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3 dB is generally considered to be the smallest change in environmental noise that is perceptible to the human ear under most normal conditions. A 10 dB change in noise represents a doubling or halving of the noise level. The difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level.

To determine the overall noise impact, taking account of both the magnitude of noise increase and receptor sensitivity, indicative Noise Effects Descriptors are presented in Table 9.9.

**Table 9.9:** Noise Effect Descriptors (IEMA)

| Magnitude            | Sensitivity                                                                                                                                                                               |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very Substantial     | Greater than 10 dB $L_{Aeq}$ change in sound level perceived at a receptor of great sensitivity to noise                                                                                  |
| Substantial          | Greater than 5 dB $L_{Aeq}$ change in sound level at a noise-sensitive receptor, or a 5 to 9.9 dB $L_{Aeq}$ change in sound level at a receptor of great sensitivity to noise             |
| Moderate             | A 3 to 4.9 dB $L_{Aeq}$ change in sound level at a sensitive or highly sensitive noise receptor, or a greater than 5 dB $L_{Aeq}$ change in sound level at a receptor of some sensitivity |
| Slight               | A 3 to 4.9 dB $L_{Aeq}$ change in sound level at a receptor of some sensitivity                                                                                                           |
| None/Not Significant | Less than 2.9 dB $L_{Aeq}$ change in sound level and/or all receptors are of negligible sensitivity to noise or marginal to the zone of influence of the proposals                        |

### 9.2.7 Assessment of Operational Phase Vibration

The rotating UPS and engines within the Energy Centre building have some potential for vibration but it is considered to be negligible. The bases for the equipment have been designed to prevent any possible vibration effects. There will be no other vibration sources associated with the operational phase of the Proposed Development, which could impact on the environment; therefore vibration criteria have not been specified for this phase.

### 9.2.8 Assessment of Operational Phase Traffic

In order to assist with the interpretation of the noise associated with vehicular traffic on public roads, Table 9.10 offers guidance as to the likely effects associated with any particular change in traffic noise level based on DMRB Noise and Vibration, and EPA Guidelines 2022.

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**Table 9.10:** Classification of Magnitude of Traffic Noise Changes in the Long-term

| Change in Sound Level (dB) | Subjective Reaction            | DMRB Magnitude of Impact (Long-term) | EPA Significance of Effect |
|----------------------------|--------------------------------|--------------------------------------|----------------------------|
| 0                          | Inaudible                      | No change                            | Neutral                    |
| 0.1 – 2.9 dB               | Barely Perceptible             | Negligible                           | Imperceptible              |
| 3 – 4.9 dB                 | Perceptible                    | Minor                                | Slight                     |
| 5 – 9.9 dB                 | Up to doubling of loudness     | Moderate                             | Moderate                   |
| 10+ dB                     | Doubling of loudness and above | Major                                | Significant                |

### 9.2.9 Cumulative Effects

As discussed in Section 2.10 of this EIAR, there are a number of permitted developments not yet built as well as projects currently in development in the vicinity of the Proposed Development site that warrant a cumulative impact assessment with the Proposed Development to which this planning application relates. These developments include the Large Scale Residential Development (LRD) immediately adjacent to the PPL site to the west (LCC Planning Ref.: 2360053), the Self Storage Facility to the north west of the PPL site (LCC Planning Ref.: 2360137), and the Boyne Mill development located ca. 550m west of the PPL site (LCC Planning Ref.: 22504, An Bord Pleanála (ABP) Ref.: 316379-23).

Cumulative impact assessments with respect to potential noise and vibration effects have been carried out for both the construction (including demolition) and operational phases in this Chapter. A review of publicly available information on the relevant developments has been carried out. This information was obtained from various sources such as the Louth County Council, Meath County Council and An Bord Pleanála planning databases, for example.

In addition, the Proposed Development has been assessed with all other existing activities and developments in the area by combining the background noise monitoring results with the predicted noise effects from the Proposed Development (see Section 9.5.4).

As described in *Chapter 2 Description of Proposed Development* of this EIAR, the Proposed Development to which this planning application relates is the first stage of a CORE. Should future phases of development be pursued, they will be subject to their own planning applications at that time which will include cumulative impact assessments with the Proposed Development for which this planning application relates and any other development that has taken place between now and then.

## 9.3 Receiving Environment

### 9.3.1 Existing Site

The site for the Proposed Development is situated on PPL's pre-existing manufacturing site.

The nearest existing population clusters to the west of the existing facility are approximately 290m from the Proposed Development site with residential areas (housing estates), as well as Our Lady's College. A new Large Scale Residential Development (LRD) has received planning permission, which is located directly adjacent to the Proposed Development site on the West (Planning Ref. no. 2360053).

To the north, the nearest noise sensitive locations are residential developments ca. 250 m from the PPL site boundary.

To the south / south-east, the nearest noise sensitive locations are the Le Cheile Educate Together National School, and some scattered residential housing located ca. 400m from the Proposed Development site.

To the east, the nearest noise sensitive location is Beaulieu House and Garden, located ca. 750m from the Proposed Development site.

PPL carries out annual noise monitoring at a number of off-site locations as part of the ongoing requirements of its current Industrial Emissions (IE) Licence (Reg. No. P0376-02). Further details of this monitoring are provided in Sections 9.3.7 and 9.3.8 of this EIAR.

### 9.3.2 Baseline Surveying (Existing Baseline Scenario)

Baseline noise surveys were carried out by PM Group on the 5<sup>th</sup> and 11<sup>th</sup> of March 2024. The baseline surveys were carried out in accordance with the EPA's NG4 Guidance Note and were carried out at 5 no. noise sensitive locations (NSL) in the vicinity of the PPL site as described in Table 9.11 and Figure 9.1.

The NSLs were selected to ensure that representative baseline noise levels could be measured at all current sensitive receptors in the vicinity of the site. It is noted that some of these locations differ from the site's current monitoring locations (Section 9.3.7). The EPA NG4 guidance states that limits typically apply at offsite NSLs, therefore current onsite monitoring locations were not considered relevant for this baseline survey.

As per the EPA NG4 Guidance Note, sound pressure levels at each NSL were measured over;

- three consecutive 15-minute periods at all NSLs during the daytime survey (07:00-19:00 hours);
- over a single 15-minute period at each NSL during the evening time survey (19:00-23:00 hours); and
- over two consecutive 15-minute periods at each NSL during the evening time survey (23:00-07:00 hours).

Contemporaneous weather observations were noted by the surveyor and are presented below. The results of the baseline monitoring are presented in Tables 9.12 to 9.14. Tonal analysis was also carried out on the results to determine if there are any tonal characteristics in the ambient environment, and the results are presented in Section 9.3.4.

The results of the baseline surveys include audible sources at existing operational facilities in the vicinity of the PPL site. These are cumulatively added to the proposed contribution from the noise sources included in the Proposed Development in Section 9.5.4 of this EIAR. The receptors included as part of this Assessment are shown in Figure 9.1.

**Table 9.11:** Description of Noise Monitoring Points

| Noise Monitoring Point (NMP) | Location Description                                                                                                                                                                      | Irish Grid Co-ordinates |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| NSL1                         | Within the site boundary on the western end of the site, adjacent to the permitted Large Scale Residential Development as discussed in Chapter 2 of this EIAR (Planning Ref. no. 2360053) | 310801E,<br>275937N     |
| NSL2                         | Gate entrance to field to the north of site on L2307 (ca. 320m from PPL Site Boundary). Gate is located on opposite side of road to the entrance to Newtown Wood residential estate.      | 310928E,<br>276386N     |
| NSL3                         | Beaulieu House and Garden to the north east of site. (ca. 770m from PPL Site Boundary)                                                                                                    | 312548E,<br>276688N     |
| NSL4                         | Le Cheile Educate Together Nation School to the south of site. (ca. 380m from PPL Site Boundary)                                                                                          | 311887E,<br>275725N     |
| NSL5                         | Farm entrance to the south of site. (ca. 370m from PPL Site Boundary)                                                                                                                     | 311287E,<br>275538N     |



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**Figure 9.1:** Locations of Baseline Noise Monitoring Points (Site Boundary in red)

### Noise Monitoring Equipment

The following noise measurement equipment was used to conduct the noise monitoring:

- Brüel and Kjaer 2250 Light Sound Level Meter (Serial No. 3008813) c/w Bruel and Kjaer type 4950 (Serial No. 3016935) Microphone c/w Windshield.
  - Last calibrated by Sonitus Systems on the 6<sup>th</sup> July 2022 in line with the requirements detailed in IEC 61672-3 (2006) and IEC 61672-1 (2003) (recalibration is required every 2 years).
- Brüel and Kjaer Type 4231 Calibrator (Serial No. 2229913).
  - Last calibrated by Sonitus Systems on the 17<sup>th</sup> July 2023 in line with the requirements of BS EN 60942:2003 (recalibration is recommended every year).
- Tripod.

The Sound Level Meter was calibrated before each survey and checked for drift after each survey using the calibrator.

### Weather Conditions

The weather conditions for the baseline noise surveys were as follows:

- **Daytime [05/03/2024 (16:02-18:48) and 11/03/2024 (13:11-14:50)]**

Dry conditions were observed for the entire monitoring period on the 5<sup>th</sup> March. It was cloudy and cool, with some spells of sun. Wind strengths fluctuated during the monitoring period but remained below 5m/s at all times, and was from a southwest direction.

On the 11<sup>th</sup> March, it was cloudy and cold. Wind strengths fluctuated during the monitoring period but remained below 5m/s at all times, and was from a southeast direction.

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- **Evening Time [05/03/2024 (19:00-21:00)]**

Dry conditions were observed for the entire monitoring period. It was cold, with clouds visible throughout. There was little to no wind for the entire survey. Wind was from a southeast direction and remained at 5m/s or below at all times.

- **Night-time [05/03/2024-06/03/2024 (23:00-02:15)]**

Dry conditions were observed for the entire monitoring period. It was cold with scattered clouds visible throughout. There was little to no wind for the entire survey. Wind was from a south west direction then changed to a southeast direction and remained 3m/s or below at all times.

### 9.3.3 Baseline Noise Monitoring Results

The  $L_{Aeq}$ ,  $L_{AMax}$ ,  $L_{A10}$  and  $L_{A90}$  results for each NSL for the daytime, evening time and night-time periods are detailed in Tables 9.12, 9.13 and 9.14, respectively. The audible noise sources during each measurement are also described in Tables 9.12-9.14.

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**Table 9.12:** Baseline Noise Monitoring Results – Daytime Monitoring

| Noise Monitoring Point | Time Period                                                   | L <sub>Aeq</sub> dB | L <sub>AMax</sub> dB | L <sub>A10</sub> dB | L <sub>A90</sub> dB | Audible sounds during measurement period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------|---------------------------------------------------------------|---------------------|----------------------|---------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NSL1<br>(1 of 3)       | Date: 05/03/2024<br>Start time: 16.02<br>Duration: 15 minutes | 47                  | 68                   | 49                  | 42                  | <ul style="list-style-type: none"> <li>- Constant road traffic on L2307 and R167 were the dominant noise source.</li> <li>- People talking on L2307 was audible.</li> <li>- Children playing in the field West of NSL.</li> <li>- Faint beeping of the site's entrance gate.</li> <li>- Some birdsong.</li> <li>- Ambulance heard in distance during third measurement.</li> <li>- Existing site activities not audible.</li> </ul>                                                                                                                                                                                                      |
| NSL1<br>(2 of 3)       | Date: 05/03/2024<br>Start time: 16.18<br>Duration: 15 minutes | 48                  | 65                   | 50                  | 43                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| NSL1<br>(3 of 3)       | Date: 05/03/2024<br>Start time: 16.34<br>Duration: 15 minutes | 49                  | 64                   | 51                  | 43                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| NSL2<br>(1 of 3)       | Date: 05/03/2024<br>Start time: 18.01<br>Duration: 15 minutes | 69                  | 88                   | 72                  | 42                  | <ul style="list-style-type: none"> <li>- Constant road traffic on L2307 was the dominant noise source.</li> <li>- Low hum of electricity from the ESB Sub Station approx. 70 metres north of NSL.</li> <li>- Some birdsong.</li> <li>- Car alarm in the distance.</li> <li>- Pedestrians walked close to meter during the third measurement.</li> <li>- Noise from the commercial units across the road (conversations, car doors shutting, rollers doors of buildings, banging.).</li> <li>- Radio music from the commercial units during the second and third measurement.</li> <li>- Existing site activities not audible.</li> </ul> |
| NSL2<br>(2 of 3)       | Date: 05/03/2024<br>Start time: 18.17<br>Duration: 15 minutes | 68                  | 86                   | 73                  | 42                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| NSL2<br>(3 of 3)       | Date: 05/03/2024<br>Start time: 18.32<br>Duration: 15 minutes | 70                  | 92                   | 73                  | 41                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| NSL3<br>(1 of 3)       | Date: 05/03/2024<br>Start time: 17.01<br>Duration: 15 minutes | 66                  | 88                   | 63                  | 38                  | <ul style="list-style-type: none"> <li>- Constant road traffic on the road was the dominant noise source.</li> <li>- Some birdsong.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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| Noise Monitoring Point | Time Period                                                   | L <sub>Aeq</sub> dB | L <sub>AMax</sub> dB | L <sub>A10</sub> dB | L <sub>A90</sub> dB | Audible sounds during measurement period                                                                                                                                                                                                                                     |
|------------------------|---------------------------------------------------------------|---------------------|----------------------|---------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NSL3<br>(2 of 3)       | Date: 05/03/2024<br>Start time: 17.17<br>Duration: 15 minutes | 66                  | 87                   | 64                  | 39                  | - Activity in the direction of the dock (boat noises on river, construction activity, alarms, banging, low hum etc.)<br>- Cars were entering and exiting the Beaulieu house frequently (Horse riding club).                                                                  |
| NSL3<br>(3 of 3)       | Date: 05/03/2024<br>Start time: 17.32<br>Duration: 15 minutes | 62                  | 88                   | 57                  | 37                  | - Horses neighing came from Beaulieu house.<br>- Pedestrians passed by close to meter (conversations).<br>- A dog barking could be heard during the first measurement.<br>- Existing site activities not audible.                                                            |
| NSL4<br>(1 of 3)       | Date: 11/03/2024<br>Start time: 13:11<br>Duration: 15 minutes | 68                  | 82                   | 73                  | 48                  | - Relatively constant traffic on R150 was the dominant noise source.<br>- Regular bus movement as road is a bus route.                                                                                                                                                       |
| NSL4<br>(2 of 3)       | Date: 11/03/2024<br>Start time: 13:26<br>Duration: 15 minutes | 68                  | 83                   | 73                  | 47                  | - Some activity across river in the dock (boat noises on river, construction activity, alarms, banging, beeping etc.)<br>- Low hum from boats passing by on river.                                                                                                           |
| NSL4<br>(3 of 3)       | Date: 11/03/2024<br>Start time: 13:42<br>Duration: 15 minutes | 69                  | 95                   | 74                  | 48                  | - Some noise from birds (large number of birds in area).<br>- Some activity from the school. Children talking/shouting and playing during the first and second measurement.<br>- Pedestrians and cyclists passing close to meter.<br>- Existing site activities not audible. |
| NSL5<br>(1 of 3)       | Date: 11/03/2024<br>Start time: 14:03<br>Duration: 15 minutes | 75                  | 92                   | 80                  | 45                  | - Constant traffic on R150 was the dominant noise source.<br>- Farm activity such as tractors in field.                                                                                                                                                                      |

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| Noise Monitoring Point | Time Period                                                   | L <sub>Aeq</sub> dB | L <sub>AMax</sub> dB | L <sub>A10</sub> dB | L <sub>A90</sub> dB | Audible sounds during measurement period                                                                                                                                                                                                                                                                                  |
|------------------------|---------------------------------------------------------------|---------------------|----------------------|---------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NSL5<br>(2 of 3)       | Date: 11/03/2024<br>Start time: 14:19<br>Duration: 15 minutes | 76                  | 91                   | 80                  | 43                  | - Tractor pulled into gate across from monitor.<br>Engine left on while opening and closing gate.<br>Beeping noise while reversing. Tractor came back and forth during all measurements.                                                                                                                                  |
| NSL5<br>(3 of 3)       | Date: 11/03/2024<br>Start time: 14:34<br>Duration: 15 minutes | 76                  | 94                   | 81                  | 50                  | - Some activity across river in the dock (boat noises on river, construction activity, alarms, banging, etc.)<br>- Some birdsong.<br>- Low electric hum from tire shop as well as banging, squealing and people talking.<br>- Pedestrians and cyclists passing close to meter.<br>- Existing site activities not audible. |

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**Table 9.13:** Baseline Noise Monitoring Results – Evening Time Monitoring

| Noise Monitoring Point | Time Period                                                   | L <sub>Aeq</sub> dB | L <sub>AMax</sub> dB | L <sub>A10</sub> dB | L <sub>A90</sub> dB | Audible sounds during measurement period                                                                                                                                                                                                                                                                                                     |
|------------------------|---------------------------------------------------------------|---------------------|----------------------|---------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NSL1<br>(1 of 1)       | Date: 05/03/2024<br>Start time: 19:28<br>Duration: 15 minutes | 45                  | 56                   | 47                  | 42                  | <ul style="list-style-type: none"> <li>- Constant road traffic on L2307 and R167 were the dominant noise sources.</li> <li>- Children playing in the field West of NSL.</li> <li>- Faint beeping of the site's entrance gate.</li> <li>- Some birdsong.</li> <li>- Existing site activities not audible.</li> </ul>                          |
| NSL2<br>(1 of 1)       | Date: 05/03/2024<br>Start time: 19:00<br>Duration: 15 minutes | 69                  | 89                   | 71                  | 44                  | <ul style="list-style-type: none"> <li>- Constant road traffic on L2307 was the dominant noise source.</li> <li>- Low hum of electricity from the ESB Sub Station approx. 70 metres north of NSL.</li> <li>- Some birdsong.</li> <li>- Car alarm could be heard in the distance.</li> <li>- Existing site activities not audible.</li> </ul> |
| NSL3<br>(1 of 1)       | Date: 05/03/2024<br>Start time: 19:53<br>Duration: 15 minutes | 66                  | 89                   | 65                  | 37                  | <ul style="list-style-type: none"> <li>- Constant road traffic on the road was the dominant noise source.</li> <li>- Some birdsong.</li> <li>- Could hear some activity in the direction of the dock (boat noises on river, construction activity, alarms, banging, etc.)</li> <li>- Existing site activities not audible.</li> </ul>        |
| NSL4<br>(1 of 1)       | Date: 05/03/2024<br>Start time: 20:24<br>Duration: 15 minutes | 56                  | 77                   | 58                  | 42                  | <ul style="list-style-type: none"> <li>- Relatively constant traffic on R150 was the dominant noise source.</li> <li>- Some activity across river in the dock (boat noises on river, construction activity, alarms, banging, etc.)</li> <li>- Some birdsong.</li> <li>- Existing site activities not audible.</li> </ul>                     |
| NSL5<br>(1 of 1)       | Date: 05/03/2024<br>Start time: 20:44<br>Duration: 15 minutes | 71                  | 88                   | 74                  | 42                  | <ul style="list-style-type: none"> <li>- Constant traffic on R150 was the dominant noise source.</li> <li>- Some activity across river in the dock (boat noises on river, construction activity, alarms, banging, etc.)</li> <li>- Some birdsong.</li> <li>- Existing site activities not audible.</li> </ul>                                |



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**Table 9.14:** Baseline Noise Monitoring Results – Night-time Monitoring

| Noise Monitoring Point | Time Period                                                   | L <sub>Aeq</sub> dB | L <sub>AMax</sub> dB | L <sub>A10</sub> dB | L <sub>A90</sub> dB | Audible sounds during measurement period                                                                                                                                                                                                                                                                                 |
|------------------------|---------------------------------------------------------------|---------------------|----------------------|---------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NSL1<br>(1 of 2)       | Date: 05/03/2024<br>Start time: 23:00<br>Duration: 15 minutes | 40                  | 52                   | 42                  | 37                  | <ul style="list-style-type: none"> <li>- Cars passing on L2307 and R167 were the dominant noise source.</li> <li>- Faint beeping of the site's entrance gate. There was a barricade onsite going up and down every two minutes. Faint buzzing noise present.</li> <li>- Existing site activities not audible.</li> </ul> |
| NSL1<br>(2 of 2)       | Date: 05/03/2024<br>Start time: 23:15<br>Duration: 15 minutes | 40                  | 55                   | 42                  | 38                  |                                                                                                                                                                                                                                                                                                                          |
| NSL2<br>(1 of 2)       | Date: 06/03/2024<br>Start time: 00:22<br>Duration: 15 minutes | 57                  | 80                   | 51                  | 50                  | <ul style="list-style-type: none"> <li>- Cars passing on L2307 was the dominant noise source.</li> <li>- Low hum of electricity from the ESB Sub Station approx. 70 metres north of NSL.</li> <li>- An alarm could be heard in the distance.</li> <li>- Existing site activities not audible.</li> </ul>                 |
| NSL2<br>(2 of 2)       | Date: 06/03/2024<br>Start time: 00:40<br>Duration: 15 minutes | 50                  | 62                   | 50                  | 49                  |                                                                                                                                                                                                                                                                                                                          |
| NSL3<br>(1 of 2)       | Date: 05/03/2024<br>Start time: 23:42<br>Duration: 15 minutes | 54                  | 82                   | 38                  | 32                  | <ul style="list-style-type: none"> <li>- Cars passing on the road was the dominant noise source (including one bus).</li> <li>- Existing site activities not audible.</li> </ul>                                                                                                                                         |
| NSL3<br>(2 of 2)       | Date: 05/03/2024<br>Start time: 23:58<br>Duration: 15 minutes | 35                  | 60                   | 36                  | 32                  |                                                                                                                                                                                                                                                                                                                          |

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| Noise Monitoring Point | Time Period                                                   | L <sub>Aeq</sub> dB | L <sub>AMax</sub> dB | L <sub>A10</sub> dB | L <sub>A90</sub> dB | Audible sounds during measurement period                                                                                                                                                                   |
|------------------------|---------------------------------------------------------------|---------------------|----------------------|---------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NSL4<br>(1 of 2)       | Date: 06/03/2024<br>Start time: 01:07<br>Duration: 15 minutes | 43                  | 64                   | 42                  | 33                  | <ul style="list-style-type: none"> <li>- Cars passing on R150 were the dominant noise source.</li> <li>- Constant hum from nearby streetlight.</li> <li>- Existing site activities not audible.</li> </ul> |
| NSL4<br>(2 of 2)       | Date: 06/03/2024<br>Start time: 01:23<br>Duration: 15 minutes | 40                  | 62                   | 39                  | 32                  |                                                                                                                                                                                                            |
| NSL5<br>(1 of 2)       | Date: 06/03/2024<br>Start time: 01:43<br>Duration: 15 minutes | 57                  | 86                   | 43                  | 37                  | <ul style="list-style-type: none"> <li>- Cars passing on R150 were the dominant noise source.</li> <li>- Existing site activities not audible.</li> </ul>                                                  |
| NSL5<br>(2 of 2)       | Date: 06/03/2024<br>Start time: 02:00<br>Duration: 15 minutes | 63                  | 93                   | 45                  | 35                  |                                                                                                                                                                                                            |

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#### 9.3.4 Tonal Analysis

Tonal analysis was carried out on the results of all noise surveys. This involved the analysis of the unweighted spectrum of noise levels recorded at each monitoring location with respect to the frequencies (Hz) at which they occurred.

1/3 octave band tonal analysis was employed which involved the measurement of an averaged noise level to represent the frequencies within each third of an octave. These noise levels were then compared with the noise levels calculated for the adjacent 1/3 octave bands. If a noise level meets the criteria outlined in Section 9.2.1 with regard to the noise levels representing the adjacent bands then it is considered tonal, since it is significantly louder than noise levels at similar frequencies.

In summary, there were tones identified during the night-time measurements at NSL2 and NSL5.

For NSL2, tones at 56dB and 55dB were identified in the 315Hz one-third octave band in the two night-time measurements. It was difficult to confirm the source of these tones; however there was an alarm audible in the distance, as well as a low hum from the ESB substation approximately 70m northeast of the NSL.

At NSL5, a tone was identified at 57dB in the 250Hz one-third octave band during the first night-time measurement. The source of this tone was not detectable.

There were no tones identified in any of the other measurements during the survey.

#### 9.3.5 Impulsive Noise

There was no impulsive noise observed during any of the monitoring periods during the daytime, evening time or night-time surveys.

#### 9.3.6 Discussion of Existing Baseline Noise Monitoring Results

The results of the baseline noise surveys during the daytime, evening time and night-time periods are presented in Tables 9.12, 9.13 and 9.14, respectively.

According to the EPA NG4 Guidance Note, Section 4.4.2, a location can be defined as a 'Quiet Area' or an 'Area of Low Background Noise' if each of the following criteria is satisfied for that location:

- Average Daytime Background Noise Level  $\leq 40\text{dB } L_{AF90}$ , and;
- Average Evening Background Noise Level  $\leq 35\text{dB } L_{AF90}$ , and;
- Average Night-time Background Noise Level  $\leq 30\text{dB } L_{AF90}$ .

##### Location NSL1

The dominant noise source at NSL1 during the daytime survey was constant road traffic from the L2307 and R167. The average results for NSL1 were 48 dB  $L_{Aeq}$  and 42 dB  $L_{A90}$  for the daytime period.

The dominant noise source at NSL1 during the evening time survey was constant road traffic from the L2307 and R167. The results for NSL1 were 45 dB  $L_{Aeq}$  and 42 dB  $L_{A90}$  for the evening time period.

The dominant noise source at NSL1 during the night-time survey was constant road traffic from the L2307 and R167. The average results for NSL1 were 40 dB  $L_{Aeq}$  and 38 dB  $L_{A90}$  for the night-time period.

Based on the EPA NG4 Guidance Note, NSL1 is not classified as a 'Quiet Area' or an 'Area of Low Background Noise' as it does not satisfy the criteria outlined above.

The existing facility activities were not audible at this noise sensitive location.

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**Location NSL2**

The dominant noise source at NSL2 during the daytime survey was traffic on the L2307. The average results for NSL2 were 69 dB  $L_{Aeq}$  and 41 dB  $L_{A90}$  for the daytime period.

The dominant noise source at NSL2 during the evening time survey was traffic on the L2307. The results for NSL2 were 69 dB  $L_{Aeq}$  and 44 dB  $L_{A90}$  for the evening time period.

The dominant noise source at NSL2 during the night-time survey was traffic on the L2307. The average results for NSL2 were 53 dB  $L_{Aeq}$  and 49 dB  $L_{A90}$  for the night-time period.

Based on the *EPA NG4 Guidance Note*, NSL2 is not classified as a 'Quiet Area' or an 'Area of Low Background Noise' as it does not satisfy the criteria outlined above.

The existing facility activities were not audible at this noise sensitive location.

**Location NSL3**

The dominant noise source at NSL3 during the daytime survey was traffic on the adjacent road. The average results for NSL3 were 65 dB  $L_{Aeq}$  and 38 dB  $L_{A90}$  for the daytime period.

The dominant noise source at NSL3 during the evening time survey was traffic on the adjacent road. The results for NSL3 were 66 dB  $L_{Aeq}$  and 37 dB  $L_{A90}$  for the evening time period.

The dominant noise source at NSL3 during the night-time survey was traffic on the adjacent road. The average results for NSL3 were 44 dB  $L_{Aeq}$  and 32 dB  $L_{A90}$  for the night-time period.

Based on the *EPA NG4 Guidance Note*, NSL3 is not classified as a 'Quiet Area' or an 'Area of Low Background Noise' as it does not satisfy the criteria outlined above.

The existing facility activities were not audible at this noise sensitive location.

**Location NSL4**

The dominant noise source at NSL4 during the daytime survey was traffic on the adjacent R150. The average results for NSL4 were 68 dB  $L_{Aeq}$  and 48 dB  $L_{A90}$  for the daytime period.

The dominant noise source at NSL4 during the evening time survey was traffic on the adjacent R150. The results for NSL4 were 56 dB  $L_{Aeq}$  and 42 dB  $L_{A90}$  for the evening time period.

The dominant noise source at NSL4 during the night-time survey was traffic on the adjacent R150. The average results for NSL4 were 41 dB  $L_{Aeq}$  and 33 dB  $L_{A90}$  for the night-time period.

Based on the *EPA NG4 Guidance Note*, NSL4 is not classified as a 'Quiet Area' or an 'Area of Low Background Noise' as it does not satisfy the criteria outlined above.

The existing facility activities were not audible at this noise sensitive location.

**Location NSL5**

The dominant noise source at NSL5 during the daytime survey was traffic on the adjacent R150. The average results for NSL5 were of 76 dB  $L_{Aeq}$  and 46 dB  $L_{A90}$  for the daytime period.

The dominant noise source at NSL5 during the evening time survey was traffic on the adjacent R150. The results for NSL5 were 71 dB  $L_{Aeq}$  and 42 dB  $L_{A90}$  for the evening time period.

The dominant noise source at NSL5 during the night-time survey was traffic on the adjacent R150. The average results for NSL5 were 60 dB  $L_{Aeq}$  and 36 dB  $L_{A90}$  for the night-time period.

Based on the *EPA NG4 Guidance Note*, NSL5 is not classified as a 'Quiet Area' or an 'Area of Low Background Noise' as it does not satisfy the criteria outlined above.

The existing facility activities were not audible at this noise sensitive location.

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### 9.3.7 Operational Baseline Scenario

PPL carries out annual noise monitoring at a number of off-site locations as part of the ongoing requirements of its current Industrial Emissions (IE) Licence (Reg. No. P0376-02). Details from the 2014 annual noise monitoring survey<sup>103</sup> (see Attachment 9.1 of this EIAR) have been re-produced here to describe the operational baseline scenario (refer to Section 1.9.4 of this EIAR).

The locations at which the monitoring was carried out are shown in Figure 9.2. These consist of 2 no. offsite NSLs (AN2 and AN3), as well as 7 no. boundary locations (N6 – N12). Monitoring is carried out at the 2 no. NSLs during both daytime and night-time periods, while monitoring is carried out at the boundary locations during the daytime only.

Tables 9.15 and 9.16 summarise the results of the daytime and night-time monitoring results for the site's 2014 annual noise survey.



**Figure 9.2:** Ongoing Annual Noise Monitoring Locations (Source: Byrne Environmental Consulting Ltd. Report – see Attachment 9.1 of this EIAR)

<sup>103</sup> Byrne Environmental Consulting Ltd. (2014). "Technical Report for Premier Periclase Ltd., Boyne Road, Drogheda, Co. Louth. Annual Noise Monitoring Survey – 2014"

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**Table 9.15: Annual Noise Monitoring 2014 Results – Daytime Monitoring**

| Noise Monitoring Point | Time Period                                                   | L <sub>Aeq</sub> dB | L <sub>AMax</sub> dB | L <sub>A10</sub> dB | L <sub>A90</sub> dB | Audible sounds / site areas during measurement period                                                                       |
|------------------------|---------------------------------------------------------------|---------------------|----------------------|---------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------|
| AN2<br>(1 of 4)        | Date: 22/09/2014<br>Start time: 09:41<br>Duration: 30 minutes | 47                  | 61                   | 50                  | 41                  | <ul style="list-style-type: none"> <li>- Site activities faintly audible.</li> <li>- Passing local road traffic.</li> </ul> |
| AN2<br>(2 of 4)        | Date: 22/09/2014<br>Start time: 10:11<br>Duration: 30 minutes | 47                  | 62                   | 49                  | 40                  |                                                                                                                             |
| AN2<br>(3 of 4)        | Date: 22/09/2014<br>Start time: 10:41<br>Duration: 30 minutes | 47                  | 77                   | 48                  | 40                  |                                                                                                                             |
| AN2<br>(4 of 4)        | Date: 22/09/2014<br>Start time: 11:11<br>Duration: 30 minutes | 44                  | 62                   | 47                  | 38                  |                                                                                                                             |
| <b>AN2</b>             | <b>Average</b>                                                | <b>46</b>           | <b>77</b>            | <b>48</b>           | <b>39</b>           |                                                                                                                             |
| AN3<br>(1 of 4)        | Date: 22/09/2014<br>Start time: 13:13<br>Duration: 30 minutes | 50                  | 68                   | 50                  | 43                  | <ul style="list-style-type: none"> <li>- Site activities faintly audible.</li> <li>- Passing local road traffic.</li> </ul> |
| AN3<br>(2 of 4)        | Date: 22/09/2014<br>Start time: 13:43<br>Duration: 30 minutes | 49                  | 66                   | 50                  | 44                  |                                                                                                                             |
| AN3<br>(3 of 4)        | Date: 22/09/2014<br>Start time: 14:13<br>Duration: 30 minutes | 50                  | 68                   | 51                  | 44                  |                                                                                                                             |
| AN3<br>(4 of 4)        | Date: 22/09/2014<br>Start time: 14:43<br>Duration: 30 minutes | 51                  | 68                   | 53                  | 43                  |                                                                                                                             |
| <b>AN3</b>             | <b>Average</b>                                                | <b>50</b>           | <b>68</b>            | <b>51</b>           | <b>43</b>           |                                                                                                                             |
| N6 (1 of 1)            | Date: 09/07/2014<br>Start time: 08:54<br>Duration: 30 minutes | 47                  | 74                   | 61                  | 50                  | Aggregate Intake Area                                                                                                       |
| N7 (1 of 1)            | Date: 09/07/2014<br>Start time: 10:34<br>Duration: 30 minutes | 49                  | 65                   | 51                  | 47                  | Lime Silos                                                                                                                  |
| N8 (1 of 1)            | Date: 09/07/2014<br>Start time: 12:04<br>Duration: 30 minutes | 55                  | 70                   | 59                  | 49                  | Tank Farm Area                                                                                                              |
| N9 (1 of 1)            | Date: 09/07/2014<br>Start time: 08:09<br>Duration: 30 minutes | 66                  | 73                   | 67                  | 64                  | Shaft Kiln & MH Furnace                                                                                                     |
| N10 (1 of 1)           | Date: 09/07/2014<br>Start time: 12:41<br>Duration: 30 minutes | 62                  | 93                   | 66                  | 52                  | Aggregate Intake Area                                                                                                       |



| Noise Monitoring Point | Time Period                                                   | L <sub>Aeq</sub> dB | L <sub>AMax</sub> dB | L <sub>A10</sub> dB | L <sub>A90</sub> dB | Audible sounds / site areas during measurement period |
|------------------------|---------------------------------------------------------------|---------------------|----------------------|---------------------|---------------------|-------------------------------------------------------|
| N11 (1 of 1)           | Date: 10/07/2014<br>Start time: 11:09<br>Duration: 30 minutes | 64                  | 93                   | 67                  | 59                  | Slaker & Coke Area & Kiln                             |
| N12 (1 of 1)           | Date: 10/07/2014<br>Start time: 08:12<br>Duration: 30 minutes | 69                  | 84                   | 69                  | 66                  | MHF Air Fans & Kiln                                   |

**Table 9.16:** Annual Noise Monitoring 2014 Results – Night-time Monitoring

| Noise Monitoring Point | Time Period                                                   | L <sub>Aeq</sub> dB | L <sub>AMax</sub> dB | L <sub>A10</sub> dB | L <sub>A90</sub> dB | Audible sounds / site areas during measurement period                                                                                                              |
|------------------------|---------------------------------------------------------------|---------------------|----------------------|---------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AN2 (1 of 3)           | Date: 22/09/2014<br>Start time: 03:16<br>Duration: 30 minutes | 42                  | 51                   | 44                  | 38                  | <ul style="list-style-type: none"> <li>- Site plant very faintly audible.</li> <li>- Passing local road traffic.</li> <li>- Birdsong in adjacent trees.</li> </ul> |
| AN2 (2 of 3)           | Date: 22/09/2014<br>Start time: 03:46<br>Duration: 30 minutes | 43                  | 62                   | 45                  | 39                  |                                                                                                                                                                    |
| AN2 (3 of 3)           | Date: 22/09/2014<br>Start time: 04:16<br>Duration: 30 minutes | 43                  | 50                   | 45                  | 39                  |                                                                                                                                                                    |
| <b>AN2</b>             | <b>Average</b>                                                | <b>43</b>           | <b>62</b>            | <b>45</b>           | <b>39</b>           |                                                                                                                                                                    |
| AN3 (1 of 3)           | Date: 22/09/2014<br>Start time: 01:16<br>Duration: 30 minutes | 44                  | 61                   | 46                  | 38                  | <ul style="list-style-type: none"> <li>- Site plant audible.</li> <li>- Passing local road traffic.</li> <li>- Bird song along coast.</li> </ul>                   |
| AN3 (2 of 3)           | Date: 22/09/2014<br>Start time: 01:46<br>Duration: 30 minutes | 43                  | 54                   | 46                  | 37                  |                                                                                                                                                                    |
| AN3 (3 of 3)           | Date: 22/09/2014<br>Start time: 02:16<br>Duration: 30 minutes | 42                  | 59                   | 45                  | 36                  |                                                                                                                                                                    |
| <b>AN3</b>             | <b>Average</b>                                                | <b>43</b>           | <b>61</b>            | <b>46</b>           | <b>37</b>           |                                                                                                                                                                    |

### 9.3.8 Discussion of Operational Baseline Scenario

The results of the daytime and night-time noise monitoring surveys carried out in 2014 as presented above in Tables 9.15 and 9.16 demonstrated compliance with the specified daytime noise limit of 55dB(A) L<sub>Aeq,30min</sub> and the night-time noise limit value of 45dB(A) L<sub>Aeq,30min</sub> at the 2 no. NSLs, AN2 and AN3.

Byrne Environmental Consulting Ltd. used the L<sub>A90,30min</sub> results to demonstrate compliance with the licence limits. They concluded that the relatively low L<sub>A90</sub> values described a noise climate, which is not adversely impacted by a dominant or an intrusive noise source.

Byrne Environmental Consulting Ltd. also stated that there were no audible or measurable tonal components recorded at either receptor AN2 or AN3 during the course of the daytime and night-time noise surveys.

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## 9.4 Characteristics of Proposed Development

The Proposed Development to which this planning application relates is the first phase of CORE, and will consist of extensive works that will transform the ca. 35.6 hectare site and set it on a path that will result in it becoming a sustainably powered enterprise campus. It is noted that the Proposed Development is unrelated to the existing Industrial Emissions licensed activity at the site. The Proposed Development consists of:

- The demolition of existing buildings, structures, and services associated with the PPL facility, as well as site clearance and remediation works.
- The careful sequestering of the licensed (inert) landfill onsite in accordance with all ongoing and future requirements of the EPA.
- A number of existing buildings and structures will be maintained as part of the Proposed Development, such as a Workshop Building, part of a Crane Store structure, 3 no. Lime Silos and water tanks and infrastructure, all of which have been incorporated into the design where beneficial and appropriate.
- The construction of a three storey Energy Centre (EC) building, a three storey Data Centre (DC) building, a single storey Facility Operations Centre (FOC) building, a single storey Pump and Filtration Building, a single storey Security Gatehouse and a Security Kiosk at the main site entrance of the site.
- The provision of a Battery Energy Storage System (BESS) Compound, an ESB Substation, a Cooling Compound, a Thermal Store Compound, a Pump and Filtration System, other ancillary structures including a Firewater Tank, a Fire Fighting Water Pump Building, a Control Building, a Maintenance Yard and Waste Management facilities. Ground-mounted solar Photo Voltaic (PV) arrays will also be provided on the existing licensed landfill and stockpile no. 3, along with 3 no. compact substations.
- The provision of all associated works including access arrangements, internal roadways and footpaths, car and cycle parking, boundary treatments, landscaping and services, and all ancillary works.

A detailed description of the Proposed Development is included in *Chapter 2 Description of Proposed Development* of this EIAR, which includes details of the demolition works required, details of the construction of the new buildings and structures, and details of the various elements that will make up the Proposed Development when it will be operational.

The following subsections provide details of the various phases of the Proposed Development which have the potential to give rise to noise and vibration effects.

### 9.4.1 Construction Phase (Including Demolition Works)

#### Construction Noise

It is anticipated that construction works on site will commence in 2025 (subject to receipt of planning permission) and that the expected duration of the construction phase (including demolition and commissioning) will be ca. 38 months.

Normal construction working hours will be daytime only (07:00-19:00 on Monday to Saturday, subject to planning permission), and it is not anticipated that any late night working will be required. Any night works will be notified to the local authority prior to its occurrence. There will be no works on Sundays or public holidays. The total number of construction staff on-site will vary during the construction phase of the development but is expected to peak at 200 persons.

A temporary construction compound will be set up within the Site for the duration of the construction works which will be used to store equipment and supplies and will include laydown areas and provide all the necessary temporary facilities such as portacabins, staff welfare facilities, car parking etc. All areas under construction will be fenced with a 2.4 m high security fence/hoarding for security and safety purposes and temporary lighting supplied as necessary.

A detailed description of the construction phase is provided in Section 2.6 of this EIAR. In summary, the construction phase will consist of site enabling works, the demolition of existing buildings and structures, laying of foundations for plant and buildings (substructure works), the erection of the proposed new buildings and structures (superstructure works), internal fit-outs, and external works including hard surfacing and paving, and landscaping and fencing.

As discussed in Section 2.6.2 of this EIAR, due to the height of a number of buildings and structures on the site that require demolition, the use of specialist designed explosive demolition will be required. Explosive felling of these large structures reduces the time required for operatives to work at height. It also reduces the duration of potential noise emissions from demolition works.

Aside from the explosive demolition works, the typical plant and machinery that are likely to be required per development works activity are listed in Table 2.3. That list has been reproduced in Table 9.17, and typical sound pressure levels associated with this plant and machinery which have been taken from Annexes C and D of the British Standards Institution *Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (BS 5228-1:2009+A1:2014)* is also provided in Table 9.17.

**Table 9.17:** Construction Equipment to be used during Construction Phase and their typical Sound Pressure Levels

| Plant                                                           | Site Enabling Works | Demolition | Substructure | Super- structure | Internal works/ /Fit-out | External Works | BS 5228-1:2009 +A1:2014 Annex C Reference | Sound Pressure Level at 10m (dB(A) $L_{Aeq}$ ) (one source) |
|-----------------------------------------------------------------|---------------------|------------|--------------|------------------|--------------------------|----------------|-------------------------------------------|-------------------------------------------------------------|
| Crane                                                           | *                   | *          | *            | *                | *                        | *              | C.4.48                                    | 76                                                          |
| MEWP's                                                          |                     | *          |              | *                | *                        |                | C.2.35                                    | 71                                                          |
| Welding plant                                                   |                     | *          |              | *                |                          | *              | C.3.31                                    | 73                                                          |
| Batching plant                                                  |                     |            |              |                  | *                        |                | C.4.22                                    | 76                                                          |
| Hydraulic bender                                                |                     |            |              |                  |                          | *              | C.1.18                                    | 79                                                          |
| Breakers and crunchers                                          |                     | *          |              |                  |                          | *              | C.1.14                                    | 82                                                          |
| Impact hammers                                                  |                     | *          |              |                  |                          |                | C.1.19                                    | 69                                                          |
| Excavator (wheeled and tracked) (assumed 5 no. at a given time) | *                   | *          | *            |                  |                          | *              | C.4.12<br>C.1.12<br>C.7.1                 | 77 (2 no.)<br>82 (2 no.)<br>78 (1 no.)                      |
| Dumper                                                          | *                   | *          | *            |                  |                          | *              | C.4.3                                     | 76                                                          |
| Hydraulic cutters                                               | *                   | *          | *            | *                |                          | *              | C.1.18                                    | 79                                                          |
| Loading lorries                                                 | *                   |            |              |                  |                          |                | C.2.27                                    | 80                                                          |
| Scaffold construction                                           | *                   |            |              | *                | *                        |                | D.7.2                                     | 72                                                          |
| Generator                                                       | *                   | *          | *            | *                | *                        | *              | C.4.85                                    | 66                                                          |
| Electric drills                                                 | *                   | *          | *            | *                | *                        | *              | D.6.52                                    | 78                                                          |
| Metal cutter                                                    | *                   | *          |              | *                | *                        | *              | C.1.18                                    | 79                                                          |
| Electric bolter                                                 | *                   |            |              | *                |                          | *              | D.6.52                                    | 78                                                          |
| Road sweeper                                                    | *                   | *          | *            | *                |                          | *              | C.4.90                                    | 76                                                          |

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| Plant                         | Site Enabling Works | Demolition | Substructure | Super- structure | Internal works/ /Fit-out | External Works | BS 5228-1:2009 +A1:2014 Annex C Reference | Sound Pressure Level at 10m (dB(A) $L_{Aeq}$ ) (one source) |
|-------------------------------|---------------------|------------|--------------|------------------|--------------------------|----------------|-------------------------------------------|-------------------------------------------------------------|
| Lorries                       | *                   | *          | *            | *                | *                        | *              | C.7.7                                     | 79                                                          |
| Dozer                         | *                   | *          |              |                  |                          | *              | C.2.1                                     | 75                                                          |
| Pneumatic breaker             | *                   | *          | *            | *                |                          | *              | C.1.6                                     | 83                                                          |
| Compressor                    |                     | *          |              |                  |                          | *              | C.5.5                                     | 65                                                          |
| Wheeled loader                |                     | *          |              |                  |                          |                | C.4.13                                    | 71                                                          |
| Hand-held breaker             | *                   | *          | *            | *                |                          | *              | C.1.6                                     | 83                                                          |
| Forklift                      |                     | *          | *            | *                |                          | *              | D.7.93                                    | 76                                                          |
| Water pump                    | *                   | *          | *            |                  |                          | *              | C.2.45                                    | 65                                                          |
| Air compressor                |                     | *          | *            | *                |                          |                | C.5.5                                     | 65                                                          |
| Lorry-mounted concrete pump   |                     |            | *            | *                | *                        | *              | C.3.26                                    | 75                                                          |
| Hydraulic vibratory compactor |                     |            | *            |                  |                          |                | C.2.42                                    | 78                                                          |
| Scabblers                     |                     |            | *            | *                |                          |                | D.6.45                                    | 83                                                          |

All of these sources have the potential to increase the ambient sound pressure levels at noise sensitive locations during the construction phase.

Construction works on Saturdays 13:00-19:00 will be scaled down in comparison to works during the rest of the week, and will not involve any noisy activities, such drilling, breaking, crunching or hammering, for example.

### **Construction Vibration**

As discussed in Section 2.6.2 of this EIAR, due to the height of a number of buildings and structures on the site that require demolition, the use of specialist designed explosive demolition will be required. While the main factor for explosive felling being safety, it has the added benefit of reducing the time required for operatives being required to work at height. It also reduces the duration of potential vibrations from demolition works.

In addition to the explosive demolition works, during the demolition phase breaking/hammering of existing structures and slabs will be required. Excavations during the ground works may also cause limited levels of vibration.

There will be no other activities expected to be required that could potentially cause vibration. Piling is not proposed for the Proposed Development; pad and strip style foundations will be utilised.

## **9.4.2 Operational Phase**

### **Operational Noise**

The Proposed Development will comprise both internal and external noise emitting sources.

In relation to internal sources, there will be 9 no. gas engines housed within the EC. There will be louvres on the external façade of each of the gas engine rooms to allow fresh air enter the room and reject air exit the room. This will lead to noise breakout from the rooms to the external environment.

All other internal noise sources will be located within rooms with no potential of significant noise being emitted to the external environment.

External noise sources will include cooling equipment such as air handling units and condensers, transformers in the substation and BESS, and the gas engine flue exhaust stacks. A full list of sources anticipated during the operational phase of the Proposed Development is provided in Table 9.18, and are shown graphically in Figure 9.3.

There are a number of potential operating scenarios, all of which have been considered in this assessment, as follows:

- Scenario 1a: Daytime and evening time operations when the daytime ambient temperature is below 24°C.
- Scenario 1b: Night- time operations when the daytime ambient temperature is below 24°C.
- Scenario 2a: Daytime and evening time operations when the daytime ambient temperature is above 24°C.
- Scenario 2b: Night-time operations when the daytime ambient temperature is above 24°C.

It is noted that Scenarios 1a and 2a are essentially the same, as the same equipment will be in operation during the daytime and evening time when the ambient daytime temperature is both below and above 24°C.

For Scenario 1b, the same sources will be in operation as Scenarios 1a and 2a with the exception of the condensers on the DC roof. The condensers will operate during the night-time period; however they will run at a lower load given the lower temperatures expected during the night-time period; therefore they will have a lower sound power level during this period.

For Scenario 2b, during periods when daytime temperatures are above 24°C, at night-time, chillers in the cooling yard will operate to build up the stored chilled water that will be needed for the extoling requirements during daytime.

Table 9.18 includes details of what sources will be operating in each of the above scenarios.

For the purposed of this assessment, it has been assumed part of the parapet on the DC roof will be acoustically treated. In addition, it has been assumed that there will be an acoustic screening on the west side of the cooling yard chillers. The extent of this acoustic attenuation for the purposes of this assessment is shown in Figure 9.4.

It is noted that during detailed design of the Proposed Development when the sound power levels of the various equipment will be verified, this assessment will be revised and the requirement for acoustic attenuation will be confirmed and refined as required. It will be ensured that the results of the assessment in this chapter will be achieved in any assessments completed during future phases of the Proposed Development's design.

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**Table 9.18:** A-weighted Sound Power Levels for Noise Sources included in Noise Model

| Noise Source                          | Applicable Scenarios | Height of Noise Sources (m)<br><small>Note 1</small> | Octave Band Frequencies (Hz) and Sound Power Levels (dB(A)) per Band |      |      |      |      |      |      |      |                 |
|---------------------------------------|----------------------|------------------------------------------------------|----------------------------------------------------------------------|------|------|------|------|------|------|------|-----------------|
|                                       |                      |                                                      | 63                                                                   | 125  | 250  | 500  | 1K   | 2K   | 4K   | 8K   | L <sub>WA</sub> |
| Substation Transformers x 2           | All scenarios        | 4.2                                                  | 21.8                                                                 | 34.9 | 43.4 | 48.8 | 47.5 | 44.2 | 42   | 36.9 | <b>53.1</b>     |
| Cooling Yard Chillers x 4             | Scenario 2b only     | 10.0                                                 | 69.0                                                                 | 82.0 | 91.5 | 93.0 | 91.5 | 90.0 | 86.0 | 71.5 | <b>98.1</b>     |
| Cooling Yard Pressurisation Units x 2 | Scenario 2b only     | 9.0                                                  | 62.0                                                                 | 67.0 | 66.0 | 58.0 | 56.0 | 53.0 | 47.0 | 40.0 | <b>70.0</b>     |
| Cooling Yard Circulation Pumps x 2    | Scenario 2b only     | 9.0                                                  | 68.0                                                                 | 70.0 | 67.0 | 65.0 | 68.0 | 65.0 | 64.0 | 61.0 | <b>75.0</b>     |
| Cooling Yard Circulation Pumps x 2    | Scenario 2b only     | 1.0                                                  | 58.0                                                                 | 62.0 | 66.0 | 72.0 | 78.0 | 77.0 | 71.  | 68.0 | <b>81.9</b>     |
| Circulation Pumps at Silos x 6        | All scenarios        | 1.0                                                  | 68.0                                                                 | 70.0 | 67.0 | 65.0 | 68.0 | 65.0 | 64.0 | 61.0 | <b>75.0</b>     |
| BESS Sources x 8                      | All scenarios        | 8.0                                                  | 67.8                                                                 | 72.9 | 76.4 | 80.8 | 76.0 | 75.2 | 72.0 | 69.9 | <b>85.0</b>     |
| Flue Exhaust Terminal Point x 9       | All scenarios        | 28.9                                                 | 64.8                                                                 | 73.9 | 68.4 | 67.8 | 76.0 | 77.2 | 77.0 | 74.9 | <b>83.3</b>     |
| EC Air Handling Units x 4             | All scenarios        | 2.5m above EC roof                                   | 28.8                                                                 | 41.9 | 50.4 | 54.8 | 55.0 | 52.2 | 49.0 | 42.9 | <b>60.0</b>     |
| Pressurisation Unit x 6               | All scenarios        | 2.0m above DC roof                                   | 62.0                                                                 | 67.0 | 66.0 | 58.0 | 56.0 | 53.0 | 47.0 | 40.0 | <b>70.0</b>     |



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| Noise Source                                                          | Applicable Scenarios | Height of Noise Sources (m)<br><small>Note 1</small> | Octave Band Frequencies (Hz) and Sound Power Levels (dB(A)) per Band |      |      |      |      |      |      |      |                 |
|-----------------------------------------------------------------------|----------------------|------------------------------------------------------|----------------------------------------------------------------------|------|------|------|------|------|------|------|-----------------|
|                                                                       |                      |                                                      | 63                                                                   | 125  | 250  | 500  | 1K   | 2K   | 4K   | 8K   | L <sub>WA</sub> |
| DC Air Handling Unit x 6                                              | All scenarios        | 2.0m above DC roof                                   | 28.8                                                                 | 41.9 | 50.4 | 54.8 | 55.0 | 52.2 | 49.0 | 42.9 | <b>60.0</b>     |
| Cooling Towers x 18 (15 no. in operation)                             | All scenarios        | 3.0m above DC roof                                   | 73.0                                                                 | 86.0 | 95.5 | 97.0 | 95.5 | 94.0 | 90.0 | 75.5 | <b>102.1</b>    |
| Battery Room Exhaust Fans x 6                                         | All scenarios        | 1.5m above DC roof                                   | 63.0                                                                 | 67.0 | 66.0 | 57.0 | 55.0 | 52.0 | 47.0 | 40.0 | <b>70.0</b>     |
| DC External Condensers x 66 (daytime and evening time operating mode) | Scenarios 1a and 2a  | 2.0m above DC roof                                   | 58.8                                                                 | 70.4 | 78.4 | 83.8 | 81.5 | 79.2 | 77.0 | 66.4 | <b>87.8</b>     |
| DC External Condensers x 66 (night-time operating mode)               | Scenarios 1b and 2b  | 2.0m above DC roof                                   | 47.8                                                                 | 65.4 | 73.4 | 78.8 | 79.0 | 77.5 | 72.0 | 62.9 | <b>84.0</b>     |
| EC External Condensers x 2                                            | All scenarios        | 2.0m above EC roof                                   | 58.8                                                                 | 70.4 | 78.4 | 83.8 | 81.5 | 79.2 | 77.0 | 66.4 | <b>87.8</b>     |
| FOC External Condensers x 10                                          | All scenarios        | 2.0                                                  | 58.8                                                                 | 70.4 | 78.4 | 83.8 | 81.5 | 79.2 | 77.0 | 66.4 | <b>87.8</b>     |
| Fresh air to gas engine room x 9                                      | All scenarios        | 2.0                                                  | 54.8                                                                 | 61.0 | 54.9 | 50.9 | 51.0 | 51.2 | 55.0 | 57.2 | <b>65.0</b>     |
| Exhaust air from gas engine room x 9                                  | All scenarios        | 2.0                                                  | 56.2                                                                 | 61.5 | 52.6 | 46.7 | 46.8 | 48.6 | 54.3 | 58.4 | <b>65.0</b>     |

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| Noise Source                                | Applicable Scenarios | Height of Noise Sources (m)<br><small>Note 1</small> | Octave Band Frequencies (Hz) and Sound Power Levels (dB(A)) per Band |      |      |      |      |      |      |      |                 |
|---------------------------------------------|----------------------|------------------------------------------------------|----------------------------------------------------------------------|------|------|------|------|------|------|------|-----------------|
|                                             |                      |                                                      | 63                                                                   | 125  | 250  | 500  | 1K   | 2K   | 4K   | 8K   | L <sub>WA</sub> |
| Solar Farm Transformers at Landfill x2      | All scenarios        | 1.0                                                  | 59.0                                                                 | 59.0 | 59.0 | 59.0 | 59.0 | 59.0 | 59.0 | 59.0 | <b>68.0</b>     |
| Solar Farm Transformer at Stockpile no.3 x1 | All scenarios        | 1.0                                                  | 59.0                                                                 | 59.0 | 59.0 | 59.0 | 59.0 | 59.0 | 59.0 | 59.0 | <b>68.0</b>     |

**Note 1:** Heights provided are above ground level unless otherwise stated (EC = Energy Centre; DC = Data Centre)

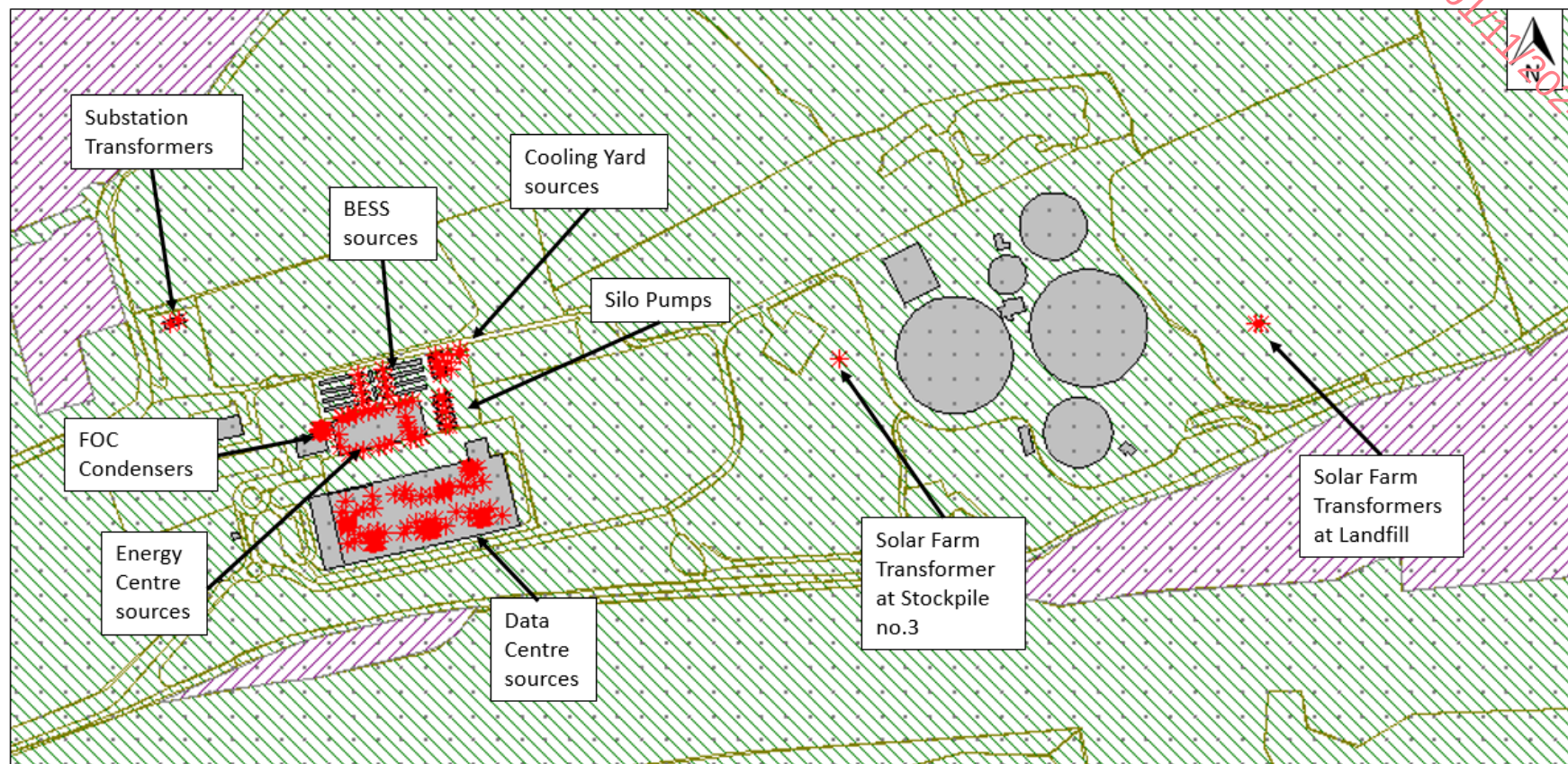


**Figure 9.3:** Image from the Predictor model showing site locations of noise sources for Proposed Development in red



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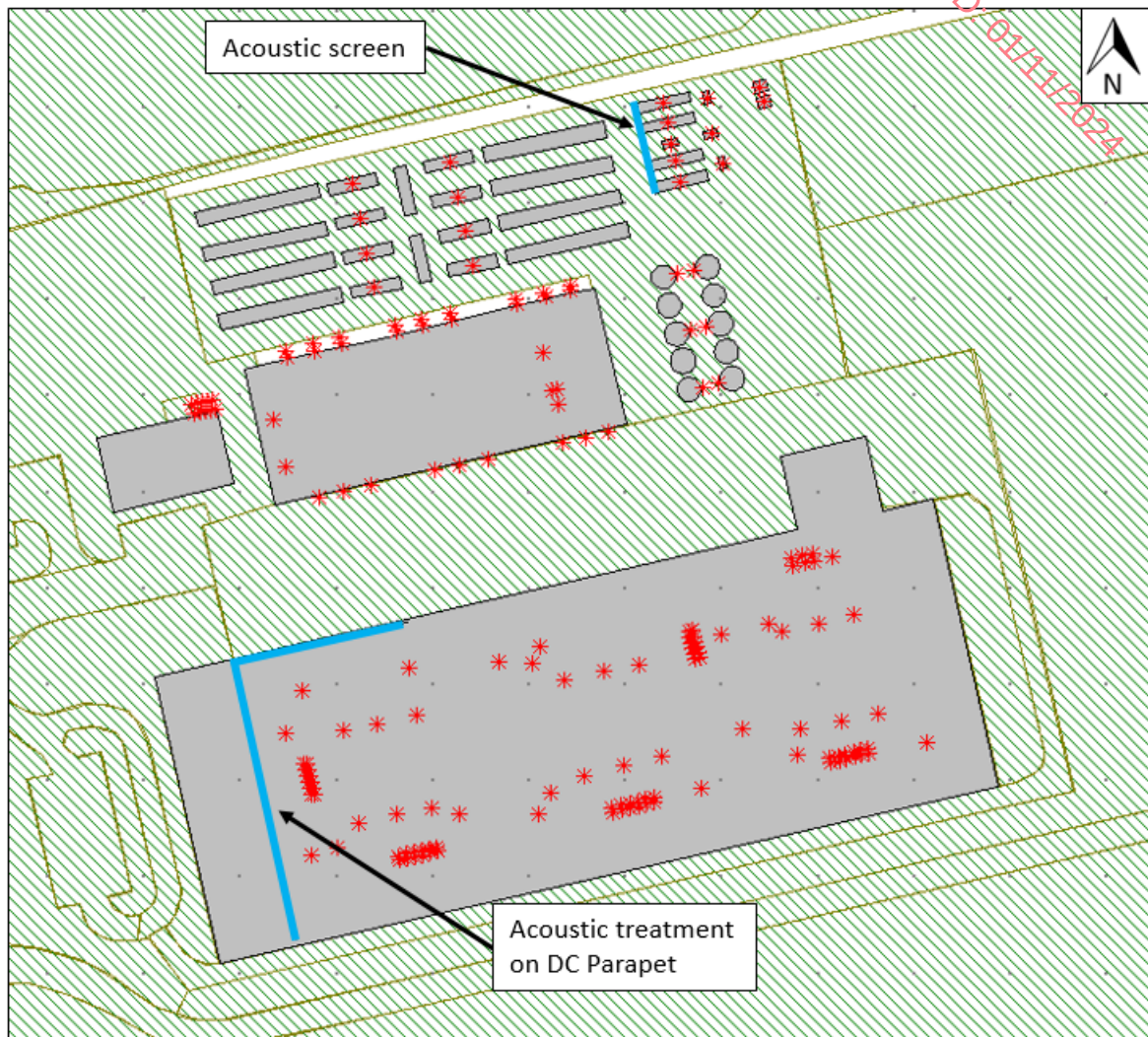


**Figure 9.4:** Acoustic Screening assumed for purposes of Assessment shown in blue (the requirement for and extent of which will be confirmed during detailed design of Proposed Development)

### **Operational Vibration**

The rotating UPS and engines within the Energy Centre building have some potential for vibration but it is considered to be negligible. The bases for the equipment have been designed to prevent any possible vibration effects. There will be no other vibration sources associated with the operational phase of the Proposed Development, which could impact on the environment.

On this basis, an assessment of potential vibration effects during the operational phase is not considered relevant for inclusion in the EIAR.

## **9.5 Potential Effects**

### **9.5.1 Construction Phase (including Demolition Works)**

#### **Construction Phase Noise**

Noise propagation calculations have been carried out to determine the predicted sound pressure levels at the NSLs under consideration as part of this assessment (Section 9.3.2 of this EIAR) from the proposed works during all activities as part of the construction phase. The noise data for the

various plant and machinery as presented in Table 9.17 has been used for these noise propagation calculations.

The summary of these calculations is presented below in Table 9.19. The appropriate limit for each NSL, taken from Section 9.2.3 of this EIAR, is also presented in Table 9.19.

For the purposes of this assessment, it has been assumed that each of the items of plant listed in Table 9.17 are operating at the same time, which is considered to be a very conservative approach. The distances provided in Table 9.19 are measured from a location approximately in the centre of the area where the majority of the works will be carried out to each of the respective NSLs. The applicable CNT provided in Table 9.19 is appropriate for construction works Monday to Friday 07:00-19:00, Saturdays 07:00-13:00 as described in Table 9.3.

**Table 9.19:** Calculated Sound Pressure Levels at NSLs from Construction Phase Activities

| NSL  | Distance from Works to NSL | Calculated Sound Pressure Level (dB(A)) |            |              |                 |                         |                | Applicable CNT (dB(A)) (refer to Table 9.3) | Compliant with CNT? |
|------|----------------------------|-----------------------------------------|------------|--------------|-----------------|-------------------------|----------------|---------------------------------------------|---------------------|
|      |                            | Site Enabling Works                     | Demolition | Substructure | Super-structure | Internal works/ Fit-out | External Works |                                             |                     |
| NSL1 | 250 m                      | 64                                      | 64         | 64           | 63              | 58                      | 64             | <b>65</b>                                   | Yes                 |
| NSL2 | 420 m                      | 59                                      | 60         | 59           | 58              | 53                      | 60             | <b>75</b>                                   | Yes                 |
| NSL3 | 1.67 km                    | 47                                      | 48         | 48           | 46              | 41                      | 48             | <b>70</b>                                   | Yes                 |
| NSL4 | 890 m                      | 53                                      | 53         | 53           | 52              | 47                      | 53             | <b>70</b>                                   | Yes                 |
| NSL5 | 510 m                      | 58                                      | 58         | 58           | 57              | 52                      | 58             | <b>75</b>                                   | Yes                 |

As can be seen from Table 9.19, the anticipated sound pressure levels at the NSLs during all construction activities are compliant with the applicable thresholds construction works Monday to Friday 07:00-19:00 and Saturdays 07:00-13:00. There are no construction activities that would be expected to give rise to noise construction levels that would be considered out of the ordinary.

As mentioned previously, the assessment carried out is considered to be a very conservative assessment as it has assumed that all plant and machinery being used during each construction activity stage is being operated at the same time. In addition, the assessment has not taken into account any screening that may be in position between the works and the receptor locations, nor has it taken into account any absorption that will occur due to soft landscaping between the works and the receptors.

The effect on the noise environment due to construction activities according to the criteria in Tables 9.3 and 9.4 is presented in Table 9.20.

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**Table 9.20:** Predicted Construction Phase Noise Effects

| NSL  | Existing Daytime Baseline $L_{Aeq}$ dB (Section 9.3.6) | Significance of Effect for Construction Phase |                   |                   |                   |                         |                   |
|------|--------------------------------------------------------|-----------------------------------------------|-------------------|-------------------|-------------------|-------------------------|-------------------|
|      |                                                        | Site Enabling Works                           | Demolition        | Substructure      | Super-structure   | Internal works/ Fit-out | External Works    |
| NSL1 | 48                                                     | Slight - Moderate                             | Slight - Moderate | Slight - Moderate | Slight - Moderate | Slight - Moderate       | Slight - Moderate |
| NSL2 | 69                                                     | Not Significant                               | Not Significant   | Not Significant   | Not Significant   | Not Significant         | Not Significant   |
| NSL3 | 65                                                     | Not Significant                               | Not Significant   | Not Significant   | Not Significant   | Not Significant         | Not Significant   |
| NSL4 | 68                                                     | Not Significant                               | Not Significant   | Not Significant   | Not Significant   | Not Significant         | Not Significant   |
| NSL5 | 76                                                     | Not Significant                               | Not Significant   | Not Significant   | Not Significant   | Not Significant         | Not Significant   |

In addition to the above, as discussed in Section 9.4.1, there will be some explosive demolition works required. Explosions have the potential to generate significant noise levels. However the explosion events causing the high noise levels will be short in duration. Ultimately demolishing the buildings and structures in question by explosion reduces the duration of the demolition phase and its associated noise effects.

Good liaison between the demolition team and neighbours (such as residents and commercial properties in the vicinity) will be established, and all neighbours will be made aware of the proposed dates and times of the explosive demolition works well in advance of such works occurring. Additionally, the explosive demolition works will be restricted to daytime hours (Monday to Saturday 07:00-19:00).

Construction works on Saturdays 13:00-19:00 will be scaled down in comparison to works during the rest of the week, and will not involve any noisy activities, such as drilling, breaking, crunching or hammering, for example. This will ensure that the applicable limits for this period, as outlined in Table 9.3 will be complied with, and there will be no significant effects at any NSL during this period.

With reference to Tables 1.5 and 9.4 of this EIAR, it is concluded that the construction phase of the Proposed Development with respect to noise will have a short-term, slight-moderate negative effect at NSL1, while it will have a short-term, not significant neutral effect at all other NSLs. Best-practice mitigation measures are presented in Section 9.6.1.

### **Construction Phase Vibration**

Potential for vibration effects during the construction phase programme are likely to be limited given the breaking of existing structures and slabs, and excavations required. Piling is not proposed for the Proposed Development; pad and strip style foundations will be utilised.

For the purposes of this assessment, BS 5228-2: 2009+A1:2014 has been referred to. There is no data available in this BS document in relation to vibration effects from rock breaking/hammering or excavations; therefore it is assumed that any vibrations caused by these works will be significantly less than the threshold for human perception and significantly less than the criteria for causing building damage (refer to Section 9.2.4).

In addition to the above, as discussed in Section 9.4.1, there will be some explosive demolition works required. Explosions have the potential to generate vibration. However the explosion events causing the high levels of vibration will be short in duration. Ultimately demolishing the buildings



and structures in question by explosion reduces the duration of the demolition phase and its associated vibration effects.

Good liaison between the demolition team and neighbours (such as residents and commercial properties in the vicinity) will be established, and all neighbours will be made aware of the proposed dates and times of the explosive demolition works well in advance of such works occurring. Additionally, the explosive demolition works will be restricted to daytime hours (07:00-19:00).

With reference to Table 1.5 of this EIAR, it is concluded that the Construction Phase of the Proposed Development with respect to vibration will have a neutral, short-term, and imperceptible effect at all sensitive receptors. Best-practice mitigation measures are presented in Section 9.6.1.

### **Construction Phase Traffic**

This section has been prepared in order to assess likely noise effects associated with construction traffic using the local road network. Information presented in *Chapter 6 Traffic and Transportation*, regarding vehicle types and predicted traffic volumes, have been used to inform this assessment.

The likely noise effects of HGV movements are assessed through consideration of the cumulative noise level associated with a series of individual events. The noise level associated with an event of short duration, such as a vehicle drive-by, may be expressed in terms of its Sound Exposure Level (SEL;  $L_{Ax}$ ). The SEL can be used to calculate the contribution of an event or series of events to the overall noise level in a given period. The appropriate formula, based on basic acoustic principles, is as follows:

$$L_{Aeq,T} = L_{Ax} + 10\log_{10}(N) - 10\log_{10}(T) - 10\log_{10}(r_2/r_1) \text{ dB}$$

Where..

$L_{Aeq,T}$  is the equivalent continuous sound level over the time period T (s);

$L_{Ax}$  is the "A-weighted" Sound Exposure Level of the event under consideration (dB);

N is the number of events over the course of time period T.

$r_2$  is the distance from the edge of the entrance road to the façade of nearest property

$r_1$  is the distance from vehicle to the point of original measurement

The mean value of Sound Exposure Level of a HGV movement is of the order of 79 dB  $L_{Ax}$  at 10m from the vehicle<sup>104</sup>.

Based on information provided in *Chapter 6 Traffic and Transportation* of this EIAR, the peak hourly number of construction vehicles is 10 per hour (20 two-way per hour) for material deliveries during the enabling and excavation works.

Also in *Chapter 6 Traffic and Transportation* of this EIAR, three potential haul routes for these vehicles are provided.

Using the conservative assessment that all construction vehicles will enter the site via the R167, the nearest noise-sensitive location to the R167 is NSL1, at a distance of ca. 200m, and a peak hourly number of construction vehicles of 20 has been used for the assessment.

The predicted noise level at this NSL, based on the methodology above is 43 dB  $L_{Aeq,1hr}$ . In the context of measured noise levels of 47 to 49 dB  $L_{Aeq}$  measured during daytime periods at NSL1, taking an average noise level of 48 dB  $L_{Aeq}$ , the cumulative noise level predicted at NSL1 is 49 dB  $L_{Aeq,1hr}$ .

Based on the criteria in Tables 9.7 and 1.5, the effect associated with construction traffic noise is negative, not significant and short-term.

<sup>104</sup> Taken from BS 5228-1:2009-A1-2014, Annex C, Table C.7.7 - Lorry

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## 9.5.2 Operational Phase

### Operational Noise

There will be a number of noise generating equipment items and activities associated with the operation of the development (see Table 9.18 and Figure 9.3). An assessment was carried out modelling the operational sound pressure levels at the nearest noise sensitive locations where the baseline noise survey was carried out – see Figure 9.1.

### **Prediction Calculation**

The sound levels associated with proposed stationary external sources at the Site were predicted according to the International Standard ISO 9613-2: 1996 *Acoustics -Attenuation of sound outdoors- Part 2: General Method of Calculation* (ISO, 1996) using Brüel & Kjær Predictor software (Version V2023). This software by using the ISO 9613-2: 1996 standard took into account a range of factors affecting the attenuation of sound including:

- Magnitude of the noise source in terms of sound power;
- Distance between the source and the receiver;
- Hardness of the ground between the source and receiver;
- Attenuation due to atmospheric adsorption;
- Meteorological effects such as wind gradient, temperature gradient and humidity.

Calculations are performed over octave bands from 63 Hz to 8 kHz and results are reported in overall A-weighted decibels (dB(A)).

Each of the major potential noise sources associated with the Proposed Development were identified with the Site designers and the sound power data representative of the expected level of each source was attained.

Noise data for each of the sources associated with the Proposed Development is presented in Table 9.18, and their locations are illustrated in Figure 9.3.

The input data to the model for each noise source included:

- The source positions – this is the proposed location on the Site of each principal equipment item/noise source (refer to Figure 9.3).
- The source elevation (metres) – the height at which noise is emitted (refer to Table 9.18).
- Directivity – emission direction, all point sources emanate in a 360° direction.
- Source Noise Emissions – The A-weighted sound power levels for each source between frequencies 63Hz and 8kHz (refer to Table 9.18).
- Working Hours – The model allows the user to define daytime, evening time and night-time periods, so that noise levels can be predicted for each period. Details in relation to what scenarios (and time periods) each source will be in operation is provided in Table 9.18.
- The Receptor Positions – Receptors NSL1-5 are the nearest NSLs as described in Table 9.11 and illustrated in Figure 9.1.
- Receptor Elevation – The receptor elevation was modelled at either one or two heights as appropriate;
  - 1.5m (typical for a single storey house)
  - 4.0m (worst case scenario, i.e. average height of a two-story house bedroom window)
- Ground Conditions – The model allows the user to distinguish between ground with hard or reflecting properties and ground with soft or absorptive properties. The layout for the Proposed Development was used to determine ground conditions for the model.

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## Source Noise Emissions Associated with Proposed Development

The sound power level data associated with the Proposed Development and included in the predictive noise model is provided in Table 9.18. An image of the noise model with all noise sources associated with the Proposed Development shown is provided in Figure 9.3.

## Prediction Calculation Results

The maximum predicted contribution from the operational phase of the Proposed Development at the NSLs under consideration for the following scenarios is presented in Table 9.21.

- Scenario 1a: Daytime and evening time operations when the daytime ambient temperature is below 24°C.
- Scenario 1b: Night- time operations when the daytime ambient temperature is below 24°C.
- Scenario 2a: Daytime and evening time operations when the daytime ambient temperature is above 24°C. [Note: this assumes the same equipment is operational as Scenario 1a above]
- Scenario 2b: Night-time operations when the daytime ambient temperature is above 24°C.

Contour plots of the maximum predicted contribution for each of the above scenarios are provided in Figures 9.5-9.7 for a contour calculation height of 1.5m above ground level. As the ground level across the site and surrounding area varies, a ground level of 11m AOD (above ordnance datum) as an average ground level for the Proposed Development site, has been assumed for the contour plots.

All results in Table 9.21 are rounded to the nearest 1dB.

**Table 9.21:** Maximum Predicted Contribution from Proposed Development at the NSLs

| Noise Sensitive Location (NSL) | Maximum Predicted Contribution at NSL (dB(A))<br>(Expected limit in brackets (dB(A))) |             |             |             |
|--------------------------------|---------------------------------------------------------------------------------------|-------------|-------------|-------------|
|                                | Scenario 1a                                                                           | Scenario 1b | Scenario 2a | Scenario 2b |
| NSL1 (at 1.5m)                 | 39 (50)                                                                               | 38 (45)     | 39 (50)     | 39 (45)     |
| NSL1 (at 4m)                   | 41 (50)                                                                               | 39 (45)     | 41 (50)     | 40 (45)     |
| NSL2 (at 1.5m)                 | 40 (50)                                                                               | 39 (45)     | 40 (50)     | 42 (45)     |
| NSL2 (at 4m)                   | 42 (50)                                                                               | 40 (45)     | 42 (50)     | 43 (45)     |
| NSL3 (at 1.5m)                 | 23 (50)                                                                               | 21 (45)     | 23 (50)     | 25 (45)     |
| NSL3 (at 4m)                   | 25 (50)                                                                               | 23 (45)     | 25 (50)     | 26 (45)     |
| NSL4 (at 1.5m)                 | 33 (50)                                                                               | 31 (45)     | 33 (50)     | 33 (45)     |
| NSL4 (at 4m)                   | 34 (50)                                                                               | 32 (45)     | 34 (50)     | 34 (45)     |
| NSL5 (at 1.5m)                 | 39 (50)                                                                               | 37 (45)     | 39 (50)     | 38 (45)     |
| NSL5 (at 4m)                   | 41 (50)                                                                               | 39 (45)     | 41 (50)     | 40 (45)     |

As can be seen from Table 9.21, the maximum sound pressure level predicted at the NSLs included in this assessment will comply with the limits expected to be included in the Site's Industrial Emissions (IE) Licence of 55 dB(A), 50 dB(A) and 45 dB(A) during daytime, evening time and night-time periods, respectively. As discussed previously, the IE Licence limits are set by the EPA in order to negate the potential effects from noise.



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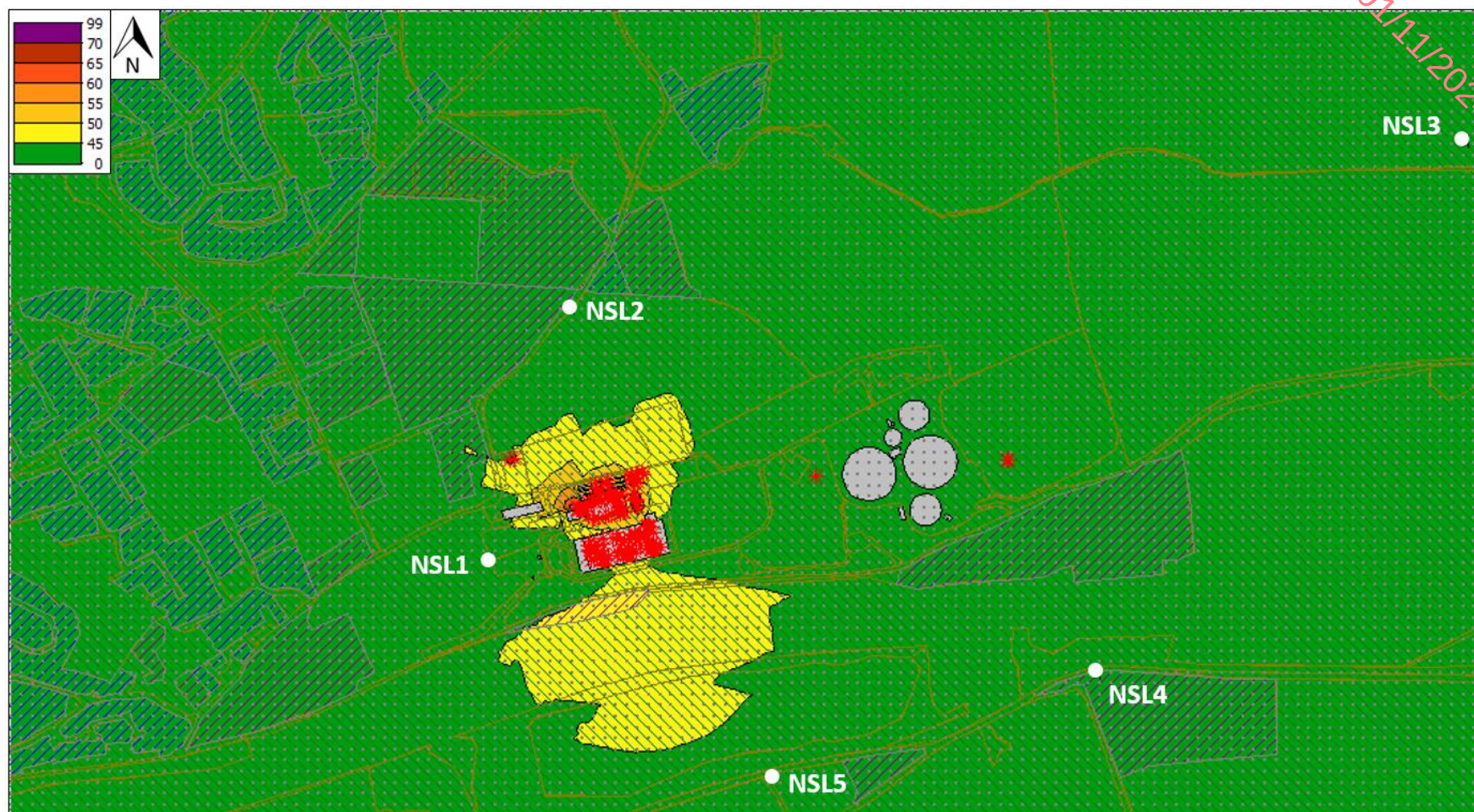


**Figure 9.5:** Predicted Noise Contour Plot for Scenarios 1a and 2a at a Receptor Height of 1.5m



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**Figure 9.6:** Predicted Noise Contour Plot for Scenario 1b at a Receptor Height of 1.5m



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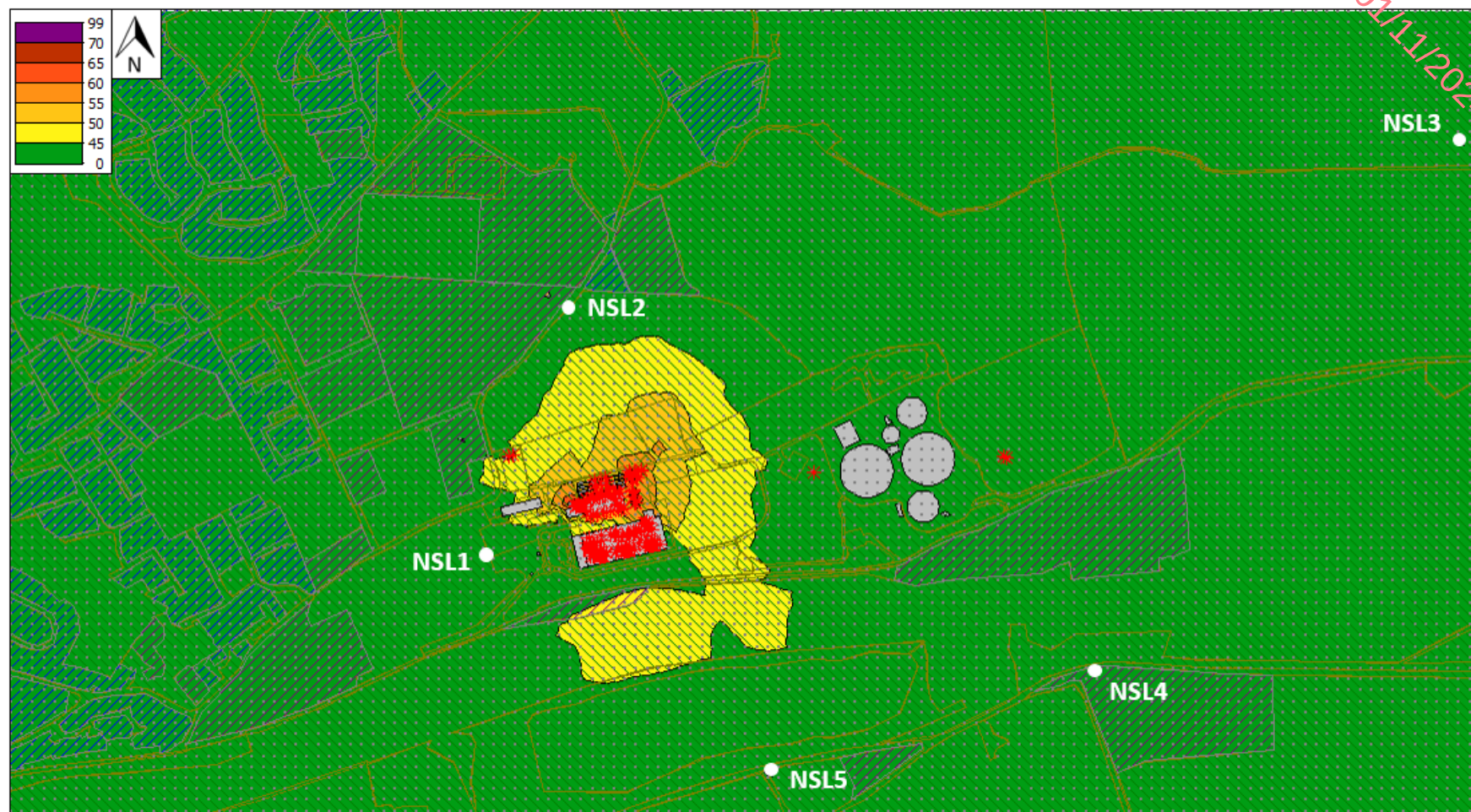


**Figure 9.7:** Predicted Noise Contour Plot for Scenario 2b at a Receptor Height of 1.5m



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### **Operational Vibration**

As discussed previously, there will be no sources of vibration associated with the operations of the Proposed Development; therefore there will be no vibration effects during the operational phase.

### **Operational Traffic**

This section has been prepared in order to assess likely noise effects associated with operational phase traffic using the local road network. Information presented in *Chapter 6 Traffic and Transportation*, regarding vehicle types and predicted traffic volumes, have been used to inform this assessment.

During the operational phase of the Proposed Development, there will be an increase in vehicular traffic associated with the site and other planned developments on surrounding roads. The predicted change in noise levels due to an increase in road traffic has been calculated for each of these roads. Projected traffic data used for the purpose of this assessment includes committed and planned developments in the vicinity of the project site as listed in *Chapter 6 Traffic and Transportation* of this EIAR.

For the purposes of assessing potential noise effects, it is appropriate to consider the relative increase in noise level associated with traffic movements on existing roads surrounding the subject site with and without development using the Annual Average Daily Traffic (AADT). The effect from the increase in traffic from the Proposed Development has been assessed for the year 2048 relative to the Do Nothing scenario for the same year, along the sections of road shown in Figure 9.8, and is provided in Table 9.22.

Table 9.22 presents a review of the potential traffic level increases attributable to the Proposed Development, and with reference to Table 9.10, indicates that the development will give rise to imperceptible increases of noise levels at road sections numbers 2 to 19 under assessment; therefore the effects are considered to be neutral.

The increases in noise level adjacent to road section 1 under assessment are considered to cause a significant effect; however it is noted that this road is the site entrance and is within the boundary of the Proposed Development. The increases in traffic levels on the site entrance are to be expected given the minimal activity on the site at present.

**Table 9.22:** Predicted Change in Noise Level from Current Baseline associated with Operation  
Vehicular Traffic

| Road Section No. (see Figure 9.8) | Do Nothing AADT 2048 | Do Something AADT 2048 | Noise level Increase (dB L <sub>A10</sub> ) between Do Nothing and Do Something (2048) |
|-----------------------------------|----------------------|------------------------|----------------------------------------------------------------------------------------|
| 1                                 | 15                   | 602                    | +16.0                                                                                  |
| 2                                 | 3,701                | 4,206                  | +0.6                                                                                   |
| 3                                 | 9,935                | 11,016                 | +0.4                                                                                   |
| 4                                 | 3,200                | 3,483                  | +0.4                                                                                   |
| 5                                 | 7,139                | 7,872                  | +0.4                                                                                   |
| 6                                 | 7,932                | 8,873                  | +0.5                                                                                   |
| 7                                 | 8,671                | 10,132                 | +0.7                                                                                   |
| 8                                 | 5,096                | 6,456                  | +1.0                                                                                   |
| 9                                 | 4,090                | 4,677                  | +0.6                                                                                   |
| 10                                | 4,474                | 4,874                  | +0.4                                                                                   |
| 11                                | 961                  | 1,132                  | +0.7                                                                                   |
| 12                                | 7,680                | 8,205                  | +0.3                                                                                   |
| 13                                | 10,420               | 10,713                 | +0.1                                                                                   |
| 14                                | 5,160                | 5,615                  | +0.4                                                                                   |
| 15                                | 6,886                | 7,002                  | +0.1                                                                                   |
| 16                                | 5,683                | 6,107                  | +0.3                                                                                   |
| 17                                | 870                  | 870                    | 0.0                                                                                    |
| 18                                | 3,494                | 3,721                  | +0.3                                                                                   |
| 19                                | 2,887                | 3,114                  | +0.3                                                                                   |

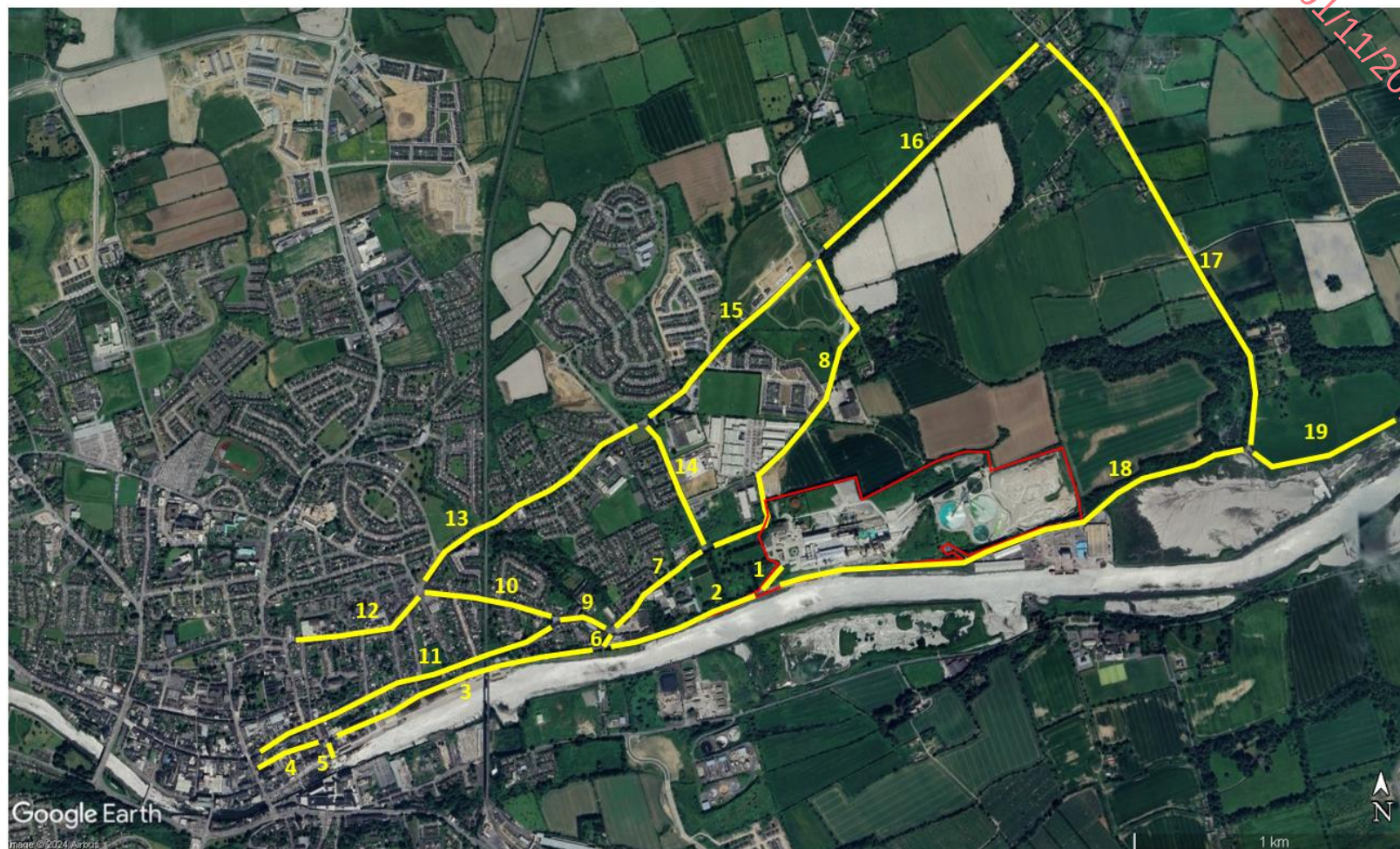


**Figure 9.8:** Section of Road Network assessed for Operational Traffic Effects

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### 9.5.3 Cumulative Effects for Operational Phase

As described in Section 9.2.9 of this EIAR, a review of permitted developments in the area has been carried out to determine if there are any of these developments that may have the potential to cause cumulative effects with the Proposed Development to which this planning application relates.

Based on the information available on the publicly available planning files and given the nature and scale of the permitted developments in question, it is concluded that none of these developments have the potential to cause cumulative effects with the Proposed Development with respect to noise and vibration during the operational phase.

All existing noise sources in the vicinity of the Proposed Development site have been captured in the results of the existing baseline noise survey described in Section 9.3 of this EIAR. The cumulative effect of existing ambient noise and predicted noise due to the Proposed Development have been calculated by adding the model predicted noise contribution (Table 9.21) to existing average ambient noise levels at the receiver points (NSLs). The results of this assessment are provided in Tables 9.23-9.25 for the daytime, evening time and night-time periods.

**Table 9.23:** Predicted Daytime Cumulative Noise Levels at the NSLs (using Scenario 1a/2a results)

| Noise Sensitive Location (NSL) | Existing Daytime Noise Levels, $L_{Aeq}$ (dB(A)) | Maximum Predicted Contribution at NSLs (dB(A)) | Cumulative Noise Levels (dB(A)) | Difference (dB(A)) |
|--------------------------------|--------------------------------------------------|------------------------------------------------|---------------------------------|--------------------|
| NSL1 (at 1.5m)                 | 48                                               | 39                                             | 49                              | +1                 |
| NSL1 (at 4m)                   | 48                                               | 41                                             | 49                              | +1                 |
| NSL2 (at 1.5m)                 | 69                                               | 40                                             | 69                              | 0                  |
| NSL2 (at 4m)                   | 69                                               | 42                                             | 69                              | 0                  |
| NSL3 (at 1.5m)                 | 65                                               | 23                                             | 65                              | 0                  |
| NSL3 (at 4m)                   | 65                                               | 25                                             | 65                              | 0                  |
| NSL4 (at 1.5m)                 | 68                                               | 33                                             | 68                              | 0                  |
| NSL4 (at 4m)                   | 68                                               | 34                                             | 68                              | 0                  |
| NSL5 (at 1.5m)                 | 76                                               | 39                                             | 76                              | 0                  |
| NSL5 (at 4m)                   | 76                                               | 41                                             | 76                              | 0                  |



**Table 9.24:** Predicted Evening Time Cumulative Noise Levels at the NSLs (using Scenario 1a/2a results)

| Noise Sensitive Location (NSL) | Existing Evening time Noise Levels, $L_{Aeq}$ (dB(A)) | Maximum Predicted Contribution at NSLs (dB(A)) | Cumulative Noise Levels (dB(A)) | Difference (dB(A)) |
|--------------------------------|-------------------------------------------------------|------------------------------------------------|---------------------------------|--------------------|
| NSL1 (at 1.5m)                 | 45                                                    | 39                                             | 46                              | +1                 |
| NSL1 (at 4m)                   | 45                                                    | 41                                             | 46                              | +1                 |
| NSL2 (at 1.5m)                 | 69                                                    | 40                                             | 69                              | 0                  |
| NSL2 (at 4m)                   | 69                                                    | 42                                             | 69                              | 0                  |
| NSL3 (at 1.5m)                 | 66                                                    | 23                                             | 66                              | 0                  |
| NSL3 (at 4m)                   | 66                                                    | 25                                             | 66                              | 0                  |
| NSL4 (at 1.5m)                 | 56                                                    | 33                                             | 56                              | 0                  |
| NSL4 (at 4m)                   | 56                                                    | 34                                             | 56                              | 0                  |
| NSL5 (at 1.5m)                 | 71                                                    | 39                                             | 71                              | 0                  |
| NSL5 (at 4m)                   | 71                                                    | 41                                             | 71                              | 0                  |

**Table 9.25:** Predicted Night-time Cumulative Noise Levels at the NSLs (using Scenario 2b results as the worst-case predicted night-time results)

| Noise Sensitive Location (NSL) | Existing Night-time Noise Levels, $L_{Aeq}$ (dB(A)) | Maximum Predicted Contribution at NSLs (dB(A)) | Cumulative Noise Levels (dB(A)) | Difference (dB(A)) |
|--------------------------------|-----------------------------------------------------|------------------------------------------------|---------------------------------|--------------------|
| NSL1 (at 1.5m)                 | 40                                                  | 39                                             | 42                              | +2                 |
| NSL1 (at 4m)                   | 40                                                  | 40                                             | 43                              | +3                 |
| NSL2 (at 1.5m)                 | 53                                                  | 42                                             | 53                              | 0                  |
| NSL2 (at 4m)                   | 53                                                  | 43                                             | 53                              | 0                  |
| NSL3 (at 1.5m)                 | 44                                                  | 25                                             | 44                              | 0                  |
| NSL3 (at 4m)                   | 44                                                  | 26                                             | 44                              | 0                  |
| NSL4 (at 1.5m)                 | 41                                                  | 33                                             | 42                              | +1                 |
| NSL4 (at 4m)                   | 41                                                  | 34                                             | 42                              | +1                 |
| NSL5 (at 1.5m)                 | 60                                                  | 38                                             | 60                              | 0                  |
| NSL5 (at 4m)                   | 60                                                  | 40                                             | 60                              | 0                  |

### Daytime

As can be seen from Table 9.23, the Proposed Development is not predicted to cause an increase in noise levels at any NSL when operational during the daytime period, with the exception of NSL1 where there is a predicted 1 dB(A) increase on existing noise levels. A 1 dB(A) increase is classified as a negligible effect according to Table 9.8 of this EIAR.

### Evening Time

As can be seen from Table 9.24, the Proposed Development is not predicted to cause an increase in noise levels at any NSL when operational during the evening time period, with the exception of NSL1 where there is a predicted 1 dB(A) increase on existing noise levels. A 1 dB(A) increase is classified as a negligible effect according to Table 9.8 of this EIAR.



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### Night-time

As can be seen from Table 9.25, the Proposed Development is not predicted to cause an increase in noise levels at any NSL when operational during the night-time period, with the exception of NSL4 where there is a predicted 1 dB(A) increase on existing noise levels, and NSL1 where there is a predicted 3 dB(A) increase on existing noise levels. A 1 dB(A) increase is classified as a negligible effect, and a 3 dB(A) increase is classified as a minor effect according to Table 9.8 of this EIAR.

The potential effects of the operational phase of the Proposed Development are likely to be long-term, neutral and imperceptible during the daytime and evening time periods, and long-term, negative and not significant at night-time (in accordance with the EPA (2022) Impact Assessment Criteria set out in Table 1.5 of this EIAR).

## 9.6 Potential Cumulative Effects

Cumulative effects may result by the addition of many minor or insignificant effects from the Proposed Development and other relevant projects to create larger, more significant effects. Relevant planned or permitted developments within the vicinity and context of the Proposed Development are outlined in Section 2.10 in *Chapter 2 Description of Proposed Development* of this EIAR and include:

- Large Scale Residential Development (LRD) (LCC Planning Ref.: 2360053);
- Self-Storage Facility (LCC Planning Ref.: 2360137);
- Boyne Mill Commercial / Residential Development (LCC Planning Ref.: 2288);
- New Apartment Development, Cord Road (LCC Planning Ref.: 22504, An Bord Pleanála (ABP) Ref.: 316379-23);
- Port Access Northern Cross Route (PANCR);
- Part 8 – Road Construction (LCC Planning Ref.: 21600);
- Permission for an Office Extension (LCC Planning Ref.: 211000); and
- Permission for a cargo warehouse building (LCC Planning Ref.: 20733).

### 9.6.1 Construction Phase (including Demolition)

There is the potential for there to be an increase in construction noise in the area if the construction phases of the various development overlap with the Proposed Development, e.g. construction of the permitted Large Scale Residential Development (LRD) to the west of the PPL is due to commence in July 2025.

However assuming all mitigation measures proposed in Section 9.7.1 of this EIAR as well as all mitigation measures proposed as part of the planning applications for the permitted developments are implemented in full, and also given the existing noise levels in the area as described in Section 9.3, any potential cumulative effects in relation to noise levels in the area are anticipated to be minimal. In addition, any potential cumulative effects will be temporary in nature and will only exist for the period that the construction phases overlap with each other.

Given that there are predicted to be imperceptible construction vibration effects from the Proposed Development only, and given the nature of the other permitted and Proposed Developments in the area, there are no cumulative vibration effects predicted during the Construction Phase.

### 9.6.2 Operational Phase

The potential cumulative effects of this Proposed Development with the other projects listed have above, as well as with the current baseline noise levels, has been assessed and is discussed in detail in Section 9.5.3 of this EIAR.

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### 9.6.3 Potential Future Phases of CORE

As described in Section 2.11 of this EIAR, the Proposed Development to which this planning application relates is the first stage of CORE. Given the level of detail available on possible future phases of CORE, it is not possible to carry out a detailed cumulative assessment of potential effects in relation to noise and vibration for the construction and operational phases with the future phases at this time.

Potential future phases of development will be subject to separate planning applications and Environmental Impact Assessment Report (EIAR), and Industrial Emissions Licensing by the EPA as required. Future phases of the development may require additional mitigation measures to ensure the proper management of effects in relation to noise and vibration. These measures will be identified and detailed as part of the detailed design and EIAR for any additional respective phases of the development to ensure the potential future phases do not have any significant adverse effect on the water environment.

Furthermore, any subsequent EIAR's for a future phase of development will cumulatively assess any existing phases at that time.

## 9.7 Mitigation Measures and Monitoring of Effects

### 9.7.1 Construction Phase (including Demolition)

As outlined in Section 9.5.1, the construction phase of the development will have the potential to cause an increase in noise levels and vibration in the immediate vicinity of the development site. However, as part of the construction contract and Construction Environmental Management Plan (CEMP), the development contractor will be obliged to reduce as far as possible the potential noise and vibration effects of the construction activity. The main mitigation measures to be taken are as follows:

- Control of Working Hours. Construction noise will occur for a period of ca. 38 months. Normal construction working hours will be Monday to Saturday 07:00 to 19:00. There will be no works on Sundays or public holidays;
- Construction works on Saturdays 13:00-19:00 will be scaled down in comparison to works during the rest of the week, and will not involve any noisy activities, such drilling, breaking, crunching or hammering, for example;
- Demolition activities will be limited to Monday to Saturday 07:00 to 19:00;
- All construction equipment will be correctly operated and maintained to ensure optimal performance and minimise out of balance effects that may result in ground-borne vibration or excessive noise. Noisy equipment will be located as far as practicable from noise sensitive receptors;
- Machinery and equipment shall be appropriately maintained and operated in accordance with the manufacturer's recommendations and switched off when not in use with preferable selection of plant with lower inherent potential for generation of noise and/or vibration;
- All construction equipment used will be required to comply with the relevant regulations on plant and equipment noise, namely the European communities (Noise Emission by Equipment of Use Outdoors) Regulations, 2001 (SI No. 632 of 2001) & Amendment Regulations, 2006 (SI No. 241 of 2006);
- Minimisation of impulsive noise sources and activities, including demolition works, reduction of material drop heights, minimising hammering activities, restricting rock breaking activities during morning-time hours together with regular checks during impulsive noise generating activities at the nearest noise sensitive locations such as the national schools and the nearest residential properties;
- Erection of a 2.4m high hoarding around the construction site to provide screening between the works and offsite receptors;

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- Noise and vibration monitors will be installed for the duration of the demolition and construction works. The locations of these monitors will be agreed with Louth County Council in advance of the works, but will include at a minimum monitors at the western boundary of the PPL site, adjacent to NSL1 (the permitted LRD to the west of the PPL site);
- Keeping all site access roads even so as to mitigate the potential for vibration from HGV movements;
- Establishing channels of communication between the Principal Contractor / Developer, Louth County Council, and neighbours (such as nearby residents and commercial properties); and
- All relevant stakeholder will be made aware of the proposed dates and times of any explosive demolition works well in advance of such works occurring.

### 9.7.2 Operational Phase

An Industrial Emissions licence will be required to allow PPL carry out the Proposed Development activities. The Site will then be governed by the conditions set out in this licence which will include noise emission limits and noise monitoring requirements.

The following mitigation measures will be implemented:

- Design, procurement and installation of new equipment to relevant industry standards (IS, EN etc.);
- Specification of maximum noise limit criteria for new equipment in procurement contracts to ensure that the sound pressure levels predicted by this assessment will be met at NLSS, including the absence of tonal/impulsive components in external equipment;
- Inspection and maintenance of equipment as part of preventive maintenance programme to ensure continued normal operation and minimise any noise issues occurring;
- The condensers to be located on the roof of the DC building will be capable of operating at a lower rating during night-time hours, thereby reducing their sound power levels during this time;
- Restricting any specific noisy activities which could impact on ambient noise levels (e.g. heavy goods deliveries, heavy maintenance) to daytime hours only (07:00-19:00);
- Testing and maintenance of the alternative cooling systems will be restricted to day time hours only. No testing or maintenance will be carried out during evening time (19:00-23:00) or night-time (23:00-07:00) hours;
- As shown in the landscape plans accompanying this planning application, a berm with planting is proposed along the western boundary of the PPL site adjacent to the permitted LRD. This will provide a level of screening / noise attenuation, not taken into account in the potential effects section of this assessment in Section 9.5; and
- Periodic noise monitoring will be carried out during the operational phase in accordance with the Site's Industrial Emissions Licence.

## 9.8 'Do Nothing' Scenario

In the scenario where the Proposed Development did not proceed as planned, none of the likely construction or operational effects as set out in this Chapter would occur.

### 9.8.1 Construction Phase (including Demolition)

In this scenario the Proposed Development would not proceed as planned, and there would be no demolition or construction noise and vibration effects on the existing environment.

Therefore, this scenario can be considered to be a neutral and imperceptible effect on the environment with respect to noise and vibration.

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### 9.8.2 Operational Phase

Should the Proposed Development not go ahead, PPL could envisage a return to peak production at the existing facility.

Therefore it is likely that noise levels at the site and in the vicinity of the site will return to noise levels similar to those described in Sections 9.3.7 and 9.3.8 of this EIAR for the operational baseline scenario. As discussed, the site was in compliance with its Industrial Emissions Licence requirements when the site was in full scale production in 2014.

There will also be an increase in deliveries to and from the site should the site return to full scale production. Historically there were ca. 70 truck deliveries per day to the site.

Therefore, this scenario can be considered to be a negative, long-term, but not significant effect on noise and vibration.

## 9.9 Residual Effects

### 9.9.1 Construction Phase (including Demolition)

With the mitigation measures outlined in Section 9.7.1 in place, the effects of the construction phase of the Proposed Development on the noise environment are likely to be short-term, negative and slight (in accordance with the EPA (2022) Impact Assessment Criteria set out in Table 1.5 of this EIAR).

As demonstrated in Section 9.5.1, there are no vibration effects associated with the construction phase of the development.

### 9.9.2 Operational Phase

With the mitigation measures outlined in Section 9.7.2 in place, the effects of the operational phase of the Proposed Development on the noise environment are likely to be long-term, negative and imperceptible (in accordance with the EPA (2022) Impact Assessment Criteria set out in Table 1.5 of this EIAR). The site will comply with the requirements of its Industrial Emissions Licence.

As demonstrated in Section 9.5.3, there are no vibration effects associated with the operational phase of the development.

## 9.10 Difficulties Encountered During Preparation of this Chapter

There were no difficulties encountered in compiling this chapter of the EIAR.

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## 10 Water & Wastewater

### 10.1 Introduction

This Chapter has been prepared to assess the potential effects on the surrounding water environment from the Proposed Development during the construction and operational phases at the Premier Periclase Ltd. (PPL) Site at Boyne Avenue, Newtownstalaban, Drogheda, Co. Louth. This Chapter should be read in conjunction with *Chapter 2 Description of the Proposed Development*, *Chapter 7 Soils, Geology & Hydrogeology* and *Chapter 8 Biodiversity* of this EIAR.

The following key aspects of the water environment relevant to the construction and operational phases of the Proposed Development are detailed within this Chapter:

- Existing surface water environment including natural water bodies (rivers, lakes, estuaries and coastal water bodies);
- Wastewater from the Proposed Development;
- Storm water (rainfall runoff) from the Proposed Development;
- Water supply;
- Firewater run-off; and
- Potential flood risk.

Based on the outcome of the assessment, necessary mitigation measures to minimise and where possible eliminate any potential effects are described.

### 10.2 Assessment Methodology

This Chapter evaluates the effects, if any, the Proposed Development will have on the existing water environment. This Chapter is written with reference to a detailed hydrological assessment completed by SLR Environmental Consulting Ltd.<sup>105</sup> which accompanies this planning application. This hydrological assessment presents a description of the receiving environment, assesses the potential effects associated with the Proposed Development, identifies key areas requiring mitigation and recommends appropriate mitigation measures. This Chapter summarises the information presented in this report.

Potential effects on groundwater are discussed and assessed in *Chapter 7 Soils, Geology & Hydrogeology* of this EIAR.

#### 10.2.1 Study Area

Based on a review of the surrounding hydrological environment, the study area for the CORE development includes:

- The Irish Sea as the receiving water body for treated wastewater from the site at IE Licensed emission point SW1 located c. 5.6 km east of the site;
- Surface water bodies located in the vicinity of the site including the Boyne Estuary located adjacent the southern site boundary;
- Surface water intake point from the River Boyne at Littlegrange located c. 7 km west of the site; and
- Seawater intake point from the Boyne Estuary and storage reservoir at Baltray located c. 3 km east of the site.

Abstraction of water from both the River Boyne at Littlegrange and the disused Mell Quarry form a combined freshwater supply to the PPL site for industrial use. The abstraction of freshwater at Mell Quarry is considered further in *Chapter 7 Soils, Geology and Hydrogeology*.

<sup>105</sup> SLR Environmental Consulting (Ireland) Ltd (2024) "Hydrogeological & Hydrological Assessment Report, CORE Project Drogheda", SLR Project No. 501.065487.00001



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### 10.2.2 Relevant Guidance, Policy and Legislation

The assessment of the potential effects of the Proposed Development on the water environment was carried out according to the methodology specified in the following legislative and guidance documents:

- Environmental Protection Agency (EPA) (2022) *"Guidelines on the Information to be Contained in Environmental Impact Assessment Reports"*;
- EPA (2003) *"Advice Notes on Current Practice (in the Preparation of Environmental Impact Statements)"*;
- National Roads Authority (NRA) (2008) *"Guidelines and Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (National Roads Authority now referred to as Transport Infrastructure Ireland)"*;
- EPA (2019) *"EPA Guidance on Retention Requirements for Firewater Run-off"*
- Water Framework Directive (2000/60/EC) *"Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy"*;
- Department of the Environment, Heritage and Local Government *"European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003)"*, as amended;
- Department of Housing, Planning and Local Government (2018) *"River Basin Management Plan for Ireland 2018 – 2021"*;
- Department of Housing, Local Government and Heritage (2024) *"Water Action Plan 2024: A River Basin Management Plan for Ireland"*;
- Department of Housing, Local Government and Heritage (2009) *"European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009)"*;
- Department of Housing, Planning and Local Government (2019) *"European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 (S.I. No. 77 of 2019)"*;
- Department of Housing, Local Government and Heritage (2024) *"Water Environment (Abstractions and Associated Impoundments) Act 2022"*
- Department of Housing, Local Government and Heritage (2024) *"Water Environment (Abstractions and Associated Impoundments) Regulations 2024 (S.I. No. 419 of 2024)"*
- Department of Housing, Local Government and Heritage (2024) *"Water Environment (Abstractions and Associated Impoundments) (Licensing Fees) Regulations 2024 (S.I. No. 418 of 2024)"*
- Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (2009) *"The Planning System and Flood Risk Management, Guidelines for Planning Authorities"*
- Urban Waste-Water Directive (91/271/EEC) *"Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment"*;
- Construction Industry Research and Information Association (CIRIA) (2001) *"Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, CIRIA 532"*;
- CIRIA (2023) *"Environmental good practice on site guide (fifth edition), CIRIA C811"*;
- CIRIA (2015) *"The Sustainable Urban Drainage Systems (SUDS) Manual, CIRIA 753"*;
- CIRIA (2016) *"Groundwater control – design and practice, CIRIA C750"*
- Inland Fisheries Ireland (2016) *"Guidelines on protection of fisheries during construction works in and adjacent to waters"*.

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## Water Framework Directive

The EU Water Framework Directive<sup>106</sup> (WFD) was introduced in 2000 and was given legal effect in Ireland by the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003), as amended. The WFD is the EU's flagship legislation for water protection providing for a single European framework for the protection of all water bodies, including surface waters and groundwater. It sets the overarching objective of achieving at least 'Good' status in all water bodies by 2027 at the latest. This is to be achieved by reducing pollution and ensuring sufficient water to support wildlife and human needs.

Surface water bodies such as rivers, lakes, estuaries and coastal water bodies can be awarded one of five statuses: *High*, *Good*, *Moderate*, *Poor* and *Bad* whereby '*High*' refers to water bodies that are not polluted, and '*Bad*' to the most polluted water bodies.

Under the WFD, the following three quality elements are combined to give the overall ecological status classification of a surface water body:

- biological elements;
- hydromorphological elements supporting the biological elements; and
- Chemical and physico-chemical elements supporting the biological elements.

Good surface water chemical status is achieved by a body of surface water in which concentrations of pollutants do not exceed the environmental quality standards (EQS).

Surface water status is the general expression of the status of a body of surface water, determined by the poorer of its ecological status and its chemical status.

The WFD identifies where actions are required to achieve '*Good*' ecological status or maintain waterbodies which are already achieving '*Good*' or '*High*' ecological status. Waterbodies can be restored to '*Good*' and '*High*' Ecological status by using targeted actions and measures to reduce the effect of human activities on them.

## Water Action Plan 2024: A River Basin Management Plan for Ireland (Third-Cycle)

The WFD Directive requires that management plans be prepared on a river basin basis and specifies a structured method for developing these plans. These River Basin Management Plans (RBMPs) are prepared and reviewed every six years. Each 6-year cycle provides an opportunity to assess water conditions at different stages and set out actions to achieve water quality objectives.

The WFD third-cycle RBMP for Ireland, referred to as the Water Action Plan 2024<sup>107</sup>, sets out a roadmap to restore Ireland's water bodies to the equivalent of '*Good*' status or better and to protect water from any further deterioration. The Plan states that "*After many years of steady improvement up to 2012, Ireland is experiencing a sustained decline in water quality since that time as evidenced by the decreasing number of high status water bodies, and the increasing number of moderate and poor status water bodies*".

The plan identifies that enhanced measures are now required in response to protect water from further decline and to restore water quality. In addition to restoring water quality, sustainable water management is important to address and adapt to Ireland's changing climate.

Protecting and restoring water quality in Ireland requires enhanced measures to address:

- the loss of excessive nutrients from land to water;
- measures to re-establish natural conditions of rivers; and
- continued investment to improve wastewater treatment infrastructure

<sup>106</sup> Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.

<sup>107</sup> Department of Housing, Local Government and Heritage (2024) "Water Action Plan 2024: A River Basin Management Plan for Ireland"

Further specific measures for each water body will be reported in 46 Catchment Management Work Plans and these plans will include targets for the third-cycle, along with Key Performance Indicators to monitor progress and outcomes.

### 10.2.3 Qualitative Assessment of Potential Effects

Each potential effect associated with the Proposed Development will be described in terms of its Quality, Significance, Duration, Probability and Type in accordance with Section 3.7.3 of 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' published by the EPA in May 2022. This descriptive terminology is summarised in Table 1.5 of Chapter 1 Introduction in this EIAR.

In line with NRA Guidance (2008)<sup>108</sup>, the significance of any potential effect will be determined based on the importance of the particular hydrological feature to be protected and the magnitude of the impact on the receiving hydrological environment. The NRA rating criteria uses the same significance terminology as the EPA, however, it has intermediate steps to justify using that terminology:

**Step 1:** Quantify the *Importance* of a hydrological feature. Features are rated as low, medium, high, very high or extremely high;

**Step 2:** Estimate the *Magnitude* of the impact on the feature from the Proposed Development (refer to Table 10.1); and

**Step 3:** Determine the significance of the impact on the feature from the matrix in NRA Guidance (2008) based on the *Importance* of the feature and the *Magnitude* of the impact (refer to Table 10.2).

**Table 10.1:** Criteria for rating impact significance at EIA stage – Estimation of Magnitude of Impact on Hydrology Attributes (NRA, 2008)

| Magnitude of Impact     | Criteria                                                                             | Typical Examples                                                                                                                                                                                                                                                                                                                                 |
|-------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Large Adverse</b>    | Results in loss of attribute and /or quality and integrity of attribute              | <ul style="list-style-type: none"> <li>– Loss or extensive change to a waterbody or water dependent habitat</li> <li>– Increase in predicted peak flood level &gt;100mm</li> <li>– Extensive loss of fishery</li> <li>– Calculated risk of serious pollution incident &gt;2% annually</li> <li>– Extensive reduction in amenity value</li> </ul> |
| <b>Moderate Adverse</b> | Results in impact on integrity of attribute or loss of part of attribute             | <ul style="list-style-type: none"> <li>– Increase in predicted peak flood level &gt;50mm</li> <li>– Partial loss of fishery</li> <li>– Calculated risk of serious pollution incident &gt;1% annually</li> <li>– Partial reduction in amenity value</li> </ul>                                                                                    |
| <b>Small Adverse</b>    | Results in minor impact on integrity of attribute or loss of small part of attribute | <ul style="list-style-type: none"> <li>– Increase in predicted peak flood level &gt;10mm</li> <li>– Minor loss of fishery</li> <li>– Calculated risk of serious pollution incident &gt;0.5% annually</li> <li>– Slight reduction in amenity value</li> </ul>                                                                                     |

<sup>108</sup> National Roads Authority (NRA) (2008) "Guidelines and Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (National Roads Authority now referred to as Transport Infrastructure Ireland)"

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| Magnitude of Impact        | Criteria                                                                                          | Typical Examples                                                                                                                                                                                         |
|----------------------------|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Negligible</b>          | Results in an impact on attribute but of insufficient magnitude to affect either use or integrity | <ul style="list-style-type: none"> <li>Negligible change in predicted peak flood level</li> <li>Calculated risk of serious pollution incident &lt;0.5% annually</li> </ul>                               |
| <b>Minor Beneficial</b>    | Results in minor improvement of attribute quality                                                 | <ul style="list-style-type: none"> <li>Reduction in predicted peak flood level &gt;10mm</li> <li>Calculated reduction in pollution risk of 50% or more where existing risk is &lt;1% annually</li> </ul> |
| <b>Moderate Beneficial</b> | Results in moderate improvement of attribute quality                                              | <ul style="list-style-type: none"> <li>Reduction in predicted peak flood level &gt;50mm</li> <li>Calculated reduction in pollution risk of 50% or more where existing risk is &gt;1% annually</li> </ul> |
| <b>Major Beneficial</b>    | Results in major improvement of attribute quality                                                 | <ul style="list-style-type: none"> <li>Reduction in predicted peak flood level &gt;100mm</li> </ul>                                                                                                      |

**Table 10.2:** Rating of Significant Environmental Impacts (NRA, 2008)

| Importance of Attribute | Magnitude of Impact |                      |                      |                      |
|-------------------------|---------------------|----------------------|----------------------|----------------------|
|                         | Negligible          | Small Adverse        | Moderate Adverse     | Large Adverse        |
| <b>Extremely High</b>   | Imperceptible       | Significant          | Profound             | Profound             |
| <b>Very High</b>        | Imperceptible       | Significant/Moderate | Profound/Significant | Profound             |
| <b>High</b>             | Imperceptible       | Moderate/Slight      | Significant/Moderate | Profound/Significant |
| <b>Medium</b>           | Imperceptible       | Slight               | Moderate             | Significant          |
| <b>Low</b>              | Imperceptible       | Imperceptible        | Slight               | Slight/Moderate      |

The analysis of the predicted effects of the Proposed Development on the existing water environment during the 'do-nothing' scenario, the construction (including demolition) phase, and the operational phase are presented in this Chapter. The assessment considered hydrological features within the study area in accordance with the methodology outlined above, to determine the significance of the effects. Where likely significant impacts are highlighted, mitigation and monitoring are proposed, and any residual effects are assessed.

#### 10.2.4 Sources of Information

The assessment presented in this Chapter has been based on both a desktop review of existing information as well as recent site specific investigation data acquired from the Proposed Development site, as follows:

- Environmental Protection Agency (EPA) "EPA Maps" <https://gis.epa.ie/SeeMaps>, accessed June 2024
- Geological Survey of Ireland (GSI) "Data and Maps" <https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx>, accessed June 2024

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- Google (2024) "Google Earth Aerial Photography" <https://www.google.com/maps>, accessed June 2024
- National Parks & Wildlife Service (NPWS) "NPWS Designations Viewer" <https://www.npws.ie/maps-and-dataa>, accessed June 2024
- Office of Public Works (OPW) "Flood Maps" [www.floodinfo.ie](http://www.floodinfo.ie), accessed June 2024;
- EPA (2024) "Cycle 3 HA 07 Boyne Catchment Report, May 2024" <https://catchments.ie/wp-content/files/catchmentassessments/07%20Boyne%20Catchment%20Summary%20WFD%20Cycle%203.pdf> (accessed July 2024);
- EPA (2021) "3<sup>rd</sup> Cycle Draft, Boyne Catchment Report (HA 07), Catchment Science & Management Unit" <https://www.catchments.ie/data/> (accessed July 2024);
- EPA (2018) "WFD Cycle 2, Cathcmnt Boyne, Subcatchment Boyne\_SC\_130, Code 07\_17" <https://www.catchments.ie/data/> (accessed July 2024);
- EPA (2023) "EPA Abstraction-Register-December-2023-for-publication" (accessed July 2024);
- SLR Environmental Consulting (Ireland) Ltd (2024) "Hydrogeological & Hydrological Assessment Report, CORE Project Drogheda", SLR Project No. 501.065487.00001 (enclosed in this planning application);
- AtkinsRéalis (2024) "Civil Engineering Report, Premier Periclase Ltd., Proposed CORE Development", Document reference: BEC231-ATK-XXX-XXXX-XX-RP-CE-300001 (enclosed in this planning application);
- AtkinsRéalis (2024a) "Flood Risk Assessment, Premier Periclase Ltd." (Report no. BEC231-ATK-XXX-XXXX-XX-RP-CE-300002 (enclosed in this planning application);
- AtkinsRealis (2024b) "Outline Demolition Method Statement, Demolition Works at the Premier Periclase Site Drogheda" (enclosed in this planning application);
- AtkinsRéalis (2024c) "Tier 2 Generic Quantitative Risk Assessment, Premier Periclase Ltd., Proposed CORE Development", Document reference: 0088045DG0015 (enclosed in this planning application);
- Premier Periclase Ltd. (PPL) (2024) "Annual Environmental Report 2023, Premier Periclase Ltd., P0376-02", dated 31 March 2024;
- Premier Periclase Ltd. (PPL) (2015) "Annual Environmental Report 2014, Premier Periclase Ltd., P0376-02", dated 31 March 2015.

### 10.2.5 Limitations

The findings contained within this Chapter are based on information obtained from a variety of sources detailed throughout the Chapter. Please note that, where we refer to information in reports from others, PM Group has assumed the accuracy of the information contained therein.

## 10.3 Receiving Environment

### 10.3.1 Baseline Conditions – Wastewater Drainage

Wastewater currently generated at the PPL site includes:

- Sanitary / foul wastewater from toilets, washrooms and canteens; and
- Process wastewater from site processing activities.

#### 1. Sanitary Wastewater

The PPL site is serviced by the existing Uisce Éireann 150 mm diameter foul sewer at the entrance road to the west of the site. Sanitary wastewater discharges to this Uisce Éireann foul sewer and ultimately to Drogheda Municipal Wastewater Treatment Plant (MWWTP).



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Wastewater from the greater Drogheda area, including the PPL site, is conveyed to the Drogheda MWWTP for treatment, which in turn discharges treated effluent to the Boyne Estuary in accordance with Wastewater Discharge Licence Reg. No. D0041-01. According to Meath's Wastewater Discharge Register<sup>109</sup>, published by Uisce Éireann in June 2023, there is spare capacity available at Drogheda MWWTP. Data in the most recent publicly available Annual Environmental Report (AER) for Drogheda WWTP<sup>110</sup> indicates that current capacity is 101,600 population equivalent (PE). Based on AER figures 2022, the treatment plant has a load of 84,606 PE indicating an available headroom of 16,994 PE. The 2022 AER also states that the MWWTP capacity is not expected to be exceeded within the next 3 years.

As stated in the Drogheda MWWTP Wastewater Discharge Licence, the emission limit values (ELVs) for the primary discharge from the Drogheda MWWTP post treatment have been established in accordance with the 'combined approach' and will comply with the treatment requirements of the Urban Waste Water Treatment Directive and contribute to the attainment of environmental objectives for the receiving water body established under the Water Framework Directive.

## 2. Process Wastewater

Wastewater generated by PPL processing activities (spent seawater) is treated on site in the effluent clarifier (neutralisation and clarification). In accordance with IE Licence P0376-02, treated effluent, together with storm water runoff from hardstanding areas in the manufacturing areas, is discharged to the Irish Sea via the existing dedicated underground discharge pipeline at a diffuser located c. 1.6 km from the coastline at IE licensed emission point SW1 (See Figure 10.1).

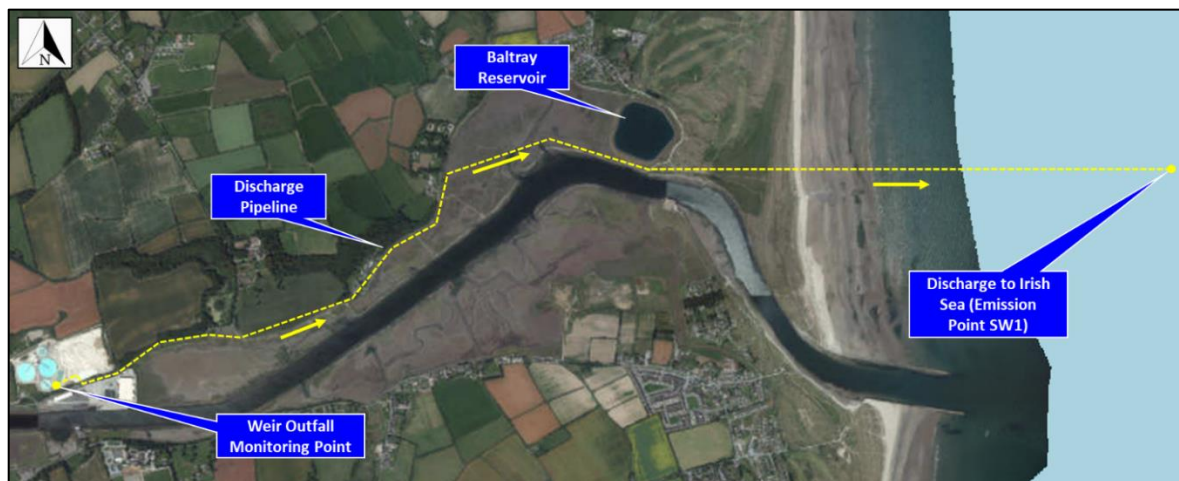


**Figure 10.1:** Existing Treated Effluent Discharge Point to the Irish Sea (IE Licenced Emission Point SW1)

Treated effluent is subject to an ongoing sampling and monitoring regime in compliance with the site's IE Licence with monitoring samples collected on site at the weir outfall prior to discharge (see Figure 10.1). Analysis of treated effluent samples collected demonstrates that discharged wastewater complies with emission limit values (ELVs) specified in the site's IE Licence. These ELVs are set by the EPA in accordance with the IE Directive to control the release of pollutants and ensure that industrial activities minimise their environmental impact with the objective of achieving a high level of protection of human health and the environment.

Tables 10.3 and 10.4 summarises the site's effluent monitoring results for 2023 and 2014 to describe the existing baseline scenario and the operational baseline scenario, respectively (refer to *Chapter 2 Description of Proposed Development*). As can be seen from Tables 10.3 and 10.4, the

<sup>109</sup> Uisce Éireann (2023), *Meath | Wastewater Treatment Capacity Register*, <https://www.water.ie/connections/developer-services/capacity-registers/wastewater-treatment-capacity-register/meath/> accessed August 2024

<sup>110</sup> Uisce Éireann (2023) "Annual Environmental Report (AER) 2022 for Drogheda WWTP (Reg. No. D0041-01)". Available at <https://leap.epa.ie/docs/19bb3451-768b-46a8-8e13-3ee27890cbaf.pdf> [last accessed June 2024]

PPL site was compliant with ELVs for all parameters in both 2023 and 2014. However it can be seen that the results for some parameters (Mineral Oils and Total Chromium) were slightly higher in 2014 when the facility was in full production than in 2023 for current operation levels, albeit the results were still compliant with the corresponding ELVs.

**Table 10.3:** Summary of 2023 SW1 Monitoring Data (Existing Baseline Scenario<sup>111</sup>)

| Parameter                 | ELV      | Monitoring Frequency | Summary of Results                                                                                               |
|---------------------------|----------|----------------------|------------------------------------------------------------------------------------------------------------------|
| pH                        | 6-11     | Hourly               | All monitoring results complied with the ELV <sup>Note 1</sup>                                                   |
| Toxicity                  | 10 TU    | Annual (in December) | Monitoring result complied with ELV with a result of <1 TU <sup>Note 2</sup>                                     |
| Suspended Solids (as MgO) | 100 mg/l | Daily                | All monitoring results complied with the ELV <sup>Note 1</sup>                                                   |
| Mineral Oil               | 20 mg/l  | Monthly              | All monitoring results complied with the ELV with all results <0.0025 mg/l <sup>Note 2</sup>                     |
| Total Chromium            | 0.1 mg/l | Monthly              | All monitoring results complied with the ELV with all results less than or equal to 0.001 mg/l <sup>Note 2</sup> |

Note 1: According to PPL AER for 2023

Note 2: According to Monitoring Data provided by PPL

**Table 10.4:** Summary of 2014 SW1 Monitoring Data (Operational Baseline Scenario<sup>112</sup>)

| Parameter                 | ELV      | Monitoring Frequency | Summary of Results                                                                                              |
|---------------------------|----------|----------------------|-----------------------------------------------------------------------------------------------------------------|
| pH                        | 6-11     | Hourly               | All monitoring results complied with the ELV <sup>Note 1</sup>                                                  |
| Toxicity                  | 10 TU    | Annual (in November) | Monitoring result complied with ELV with a result of <2 TU <sup>Note 1</sup>                                    |
| Suspended Solids (as MgO) | 100 mg/l | Daily                | All monitoring results complied with the ELV with all results less than 93 mg/l <sup>Note 1</sup>               |
| Mineral Oil               | 20 mg/l  | Monthly              | All monitoring results complied with the ELV with all results less than or equal to 0.1 mg/l <sup>Note 1</sup>  |
| Total Chromium            | 0.1 mg/l | Monthly              | All monitoring results complied with the ELV with all results less than or equal to 0.05 mg/l <sup>Note 1</sup> |

Note 1: According to Monitoring Data provided by PPL

### 10.3.2 Baseline Conditions – Storm Water Drainage

Historically, there were 2 no. storm water discharges to the adjacent Boyne Estuary associated with the main PPL facility. One of these storm outfalls is no longer in use (see Figure 10.2) as storm water collected predominately from the production areas was redirected internally and now ultimately outfalls in the Irish Sea at IE Licenced emission point, SW1 (see Figure 10.1).

Currently, rainfall runoff from the production area is collected in the "Yard Sump" or "Sand Hole" collection/settlement facilities, with a small portion collected in a Slaker Bund. From here, storm water is pumped directly to the settlement pond in the eastern part of the site. The clarified water is then pumped into the inner sump of the weir outfall, where it mixes with treated process seawater

<sup>111</sup> This baseline scenario is representative of the existing site conditions with production activity at the facility scaled back pending the outcome of the current planning application.

<sup>112</sup> This baseline scenario is representative of site conditions when the licensed activity is fully active c. 2014

from the effluent clarifier before being discharged over the weir outfall and onward to emission point SW1 located in the Irish Sea. As discussed above, discharges at licenced emission point SW1 are compliant with ELVs specified in the site's IE Licence.

Storm water collected from low risk non-process areas (i.e., offices and car parking) located in the western part of the PPL site, discharges to the River Boyne tidal section at an outfall location near the south-western corner of the site immediately opposite the site entrance, as shown in Figure 10.2.

Byrne Environmental Consulting Ltd. (BECL) was commissioned by PPL to undertake water quality monitoring of this discharge with a storm water discharge sample collected from the last manhole access point on the drain on the PPL site at sample location DR3 (Figure 10.2), on the 1st October 2024. A copy of the BECL monitoring report and water quality results are included in the hydrological assessment completed by SLR Environmental Consulting Ltd. (2024).

No evidence of contamination was noted during this sampling event with the water sample noted to be odourless and clear with no hydrocarbon sheen reported to be present. Overall, analytical results indicate that the storm water quality at DR3 is generally good with low suspended solids (5 mg/l) and hydrocarbon (TPH) levels below the laboratory detection level of 1 µg/l. Field testing and external laboratory analysis of the collected sample both indicated a slightly elevated pH, at 9.08 and 9.33 pH Units, respectively, above the environmental quality standard (EQS) of  $6.0 < \text{pH} < 9.0$ .

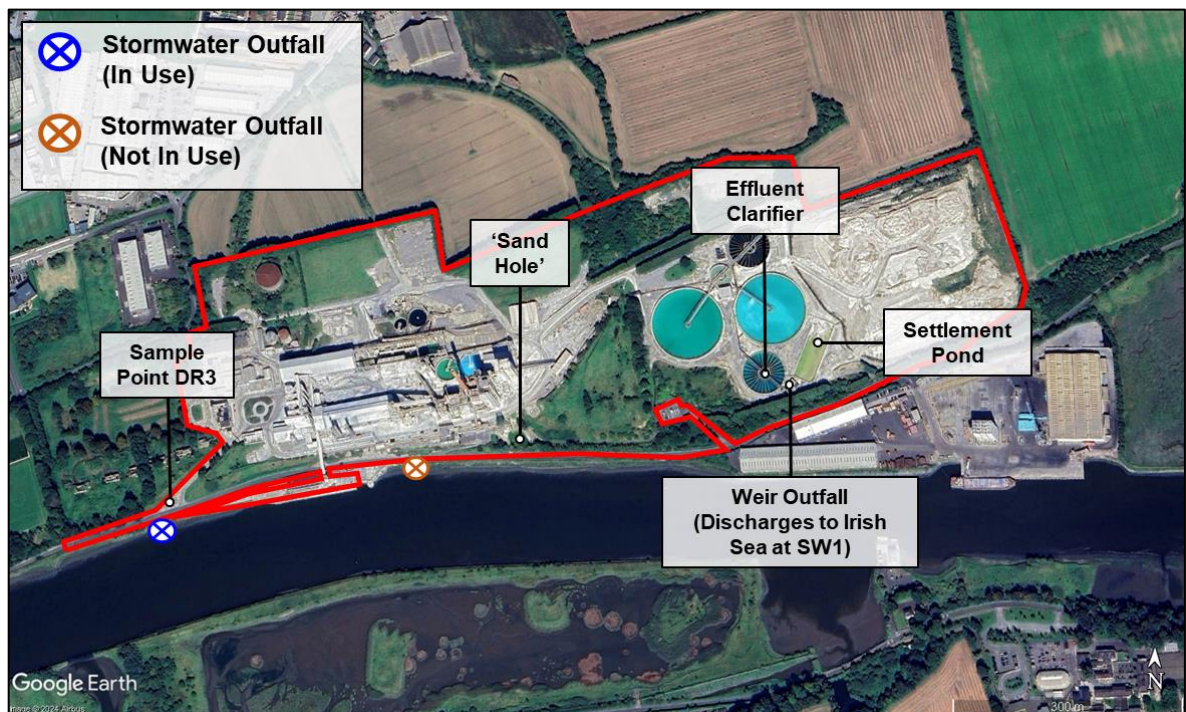


**Figure 10.2:** Existing and Former Storm Water Discharge Points to the Boyne Estuary

### 10.3.3 Baseline Conditions – Water Supply

Water supply to the PPL site is from the following sources:

- Mains Uisce Éireann water supply;
- Freshwater from the registered Little Grange / Mell Quarry abstraction regime; and
- Seawater from the registered abstraction at Baltray.

#### 1. Mains Water Supply

The PPL facility is situated within the South Louth & East Meath water supply zone. The Staleen Water Treatment Plant is the primary drinking water production facility serving Drogheda, South



Louth and East Meath. The facility comprises of an abstraction from the River Boyne, a raw water pumping station at Roughgrange, a treatment plant at Staleen and storage reservoirs at Donore. This supply zone feeds the local population of ca. 70,000 with potable drinking water demands.

Potable water facilities at the site is supplied by Uisce Éireann from this potable water network via the 100 mm diameter public watermain located outside the western boundary of the site (see Figure 10.3).

Based on data in PPL AERs, the public supply water use for both the existing baseline scenario and the operational baseline scenario (refer to *Chapter 2 Description of Proposed Development*) is summarised as follows:

- Existing Baseline Scenario (2023): 1,451 m<sup>3</sup>/year; and
- Operational Baseline Scenario (2014): 38,383 m<sup>3</sup>/year.

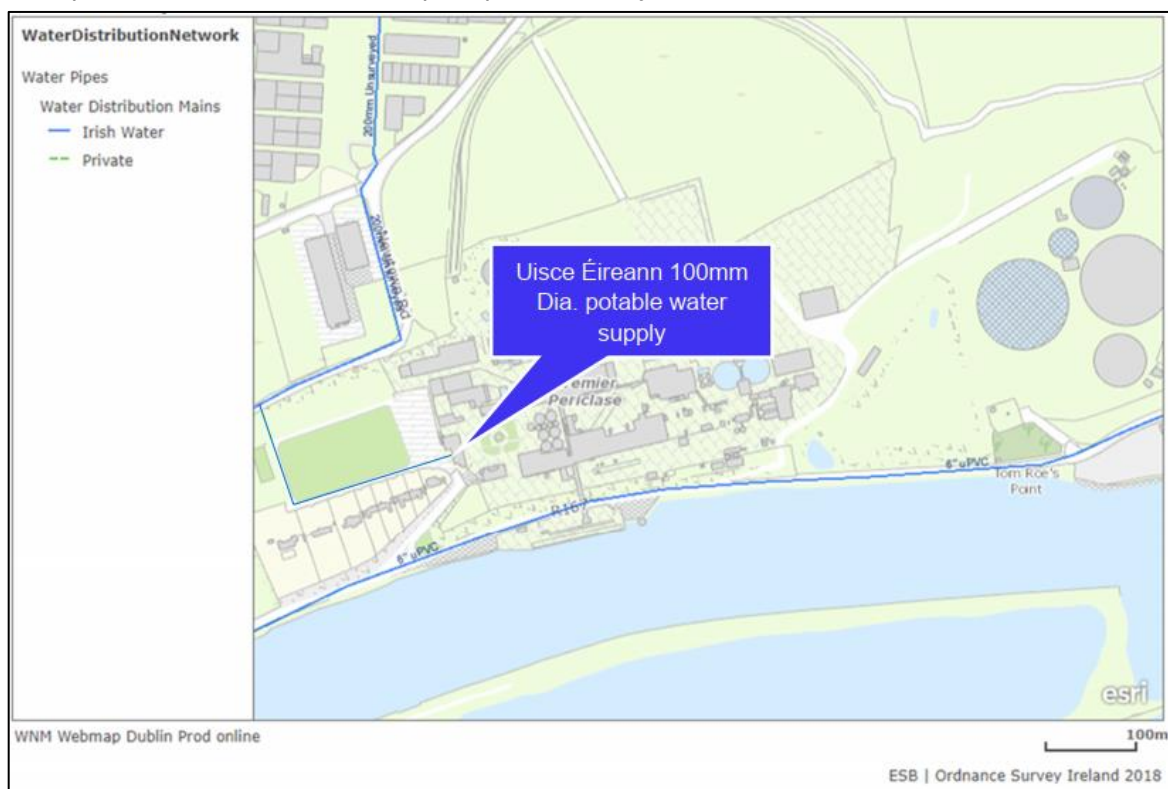


**Figure 10.3:** Existing Potable Water Supply to the site

## 2. Freshwater Supply

Abstraction of freshwater from both the River Boyne at Littlegrange and the disused Mell Quarry form a combined freshwater supply to the PPL site for industrial use. This freshwater abstraction regime is registered with the EPA under Water Abstractions Register No. R00514-01 with a maximum daily volume estimate for abstraction of 3,434 m<sup>3</sup>/day.

The indicative route of the existing freshwater supply pipeline to the PPL site is presented in Figure 10.4. Surface water abstracted from the River Boyne at Littlegrange is pumped to Mell Quarry as required. Freshwater abstracted from Mell Quarry is pumped to a static tank approximately 250 m to the northeast and from here it flows by gravity through an existing 300 mm diameter pipeline to the PPL site. Ongoing abstraction of freshwater at Mell Quarry also serves to manage water levels in the disused quarry and prevents flooding of water abstraction infrastructure located on the eastern side of the quarry.

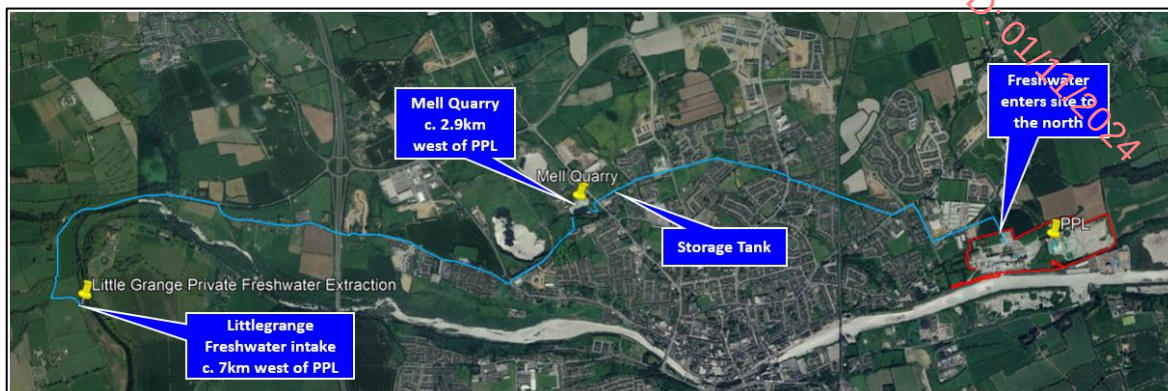


**Figure 10.4:** Existing Freshwater Supply to the site.

The EPA has developed a database consisting of estimates of naturalised river flow duration percentiles for Irish rivers, which enable the assessment of quantitative impacts relating to hydrological alterations. Data from EPA flow node 07\_1716, adjacent to Littlegrange abstraction point, capturing the flow within the Boyne catchment, are indicated in Table 10.5 below.

**Table 10.5:** River Boyne Flow estimates (EPA-07\_1716) for abstraction point Littlegrange (Extracted from SLR Environmental Consulting, 2024)

| Naturalised flow percentiles | Q (m <sup>3</sup> /s) |
|------------------------------|-----------------------|
| 1                            | 189.516               |
| 5                            | 115.379               |
| 10                           | 89.08                 |
| 20                           | 62.912                |
| 30                           | 47.013                |
| 40                           | 35.688                |
| 50                           | 27.419                |
| 60                           | 21.23                 |
| 70                           | 15.608                |
| 80                           | 10.988                |
| 90                           | 6.923                 |
| 95                           | 5.11                  |

Considering a maximum daily abstraction volume of 3,434 m<sup>3</sup>/day (0.04 m<sup>3</sup>/s) at the Littlegrange intake point, the abstraction during particularly low river flows, i.e. the 95%ile flow estimated to be c. 5.11 m<sup>3</sup>/s, would be only 0.78% of the river flow (SLR Environmental Consulting, 2024).

### 3. Seawater Supply

Baltray Pump Station, located approximately 3 km east of the site boundary, on the downstream River Boyne and estuary, is a dedicated abstraction point for seawater, which is used in the process of Magnesium Hydroxide precipitation at the PPL facility and to reduce the pH of surface water runoff from the site. This seawater abstraction point is registered with the EPA under Water Abstractions Register No. R00514-01 with a maximum daily volume for abstraction of 90,132 m<sup>3</sup>/day.

The pumping period at this abstraction point is approximately two hours each side of high tide, i.e. two four hour periods per day, with abstracted seawater stored in the adjacent Baltray Reservoir (300,000 m<sup>3</sup> capacity) to ensure that a seawater supply is available at all times. The pumps at the



seawater intake are controlled by salinity meters, which kick in and out when the salinity in the water reaches or drops below the set point; this measure is to ensure that only seawater is taken into the reservoir. The abstracted seawater is initially chlorinated to a maximum level of 5 ppm, to keep the supply pipes clean from mussel growth.

The indicative route of the existing seawater supply pipeline to the PPL site is presented in Figure 10.5. Seawater is pumped from the Baltray Reservoir to the site as required via a mix of buried and above-ground pipework.

Spent seawater (which is seawater than has undergone a process to remove the magnesium) is treated at the PPL site including neutralisation and clarification prior to ultimate discharge to the Irish Sea at SW1 as discussed in Section 10.3.1. Figure 10.5 also presents the indicative route of the licenced discharge pipeline which outfalls at IE Licenced Emission Point SW1.

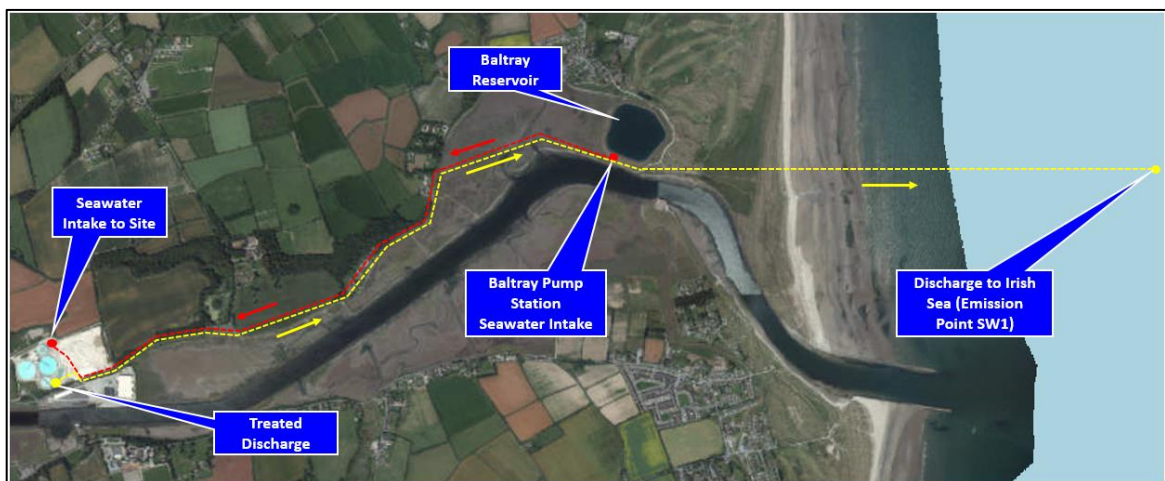


**Figure 10.5:** Existing PPL Seawater Infrastructure

#### 10.3.4 Hydrology

##### 1. WFD Catchment

The site is located within the Boyne Catchment (Hydrometric Area 07) which includes the area drained by the River Boyne and by all streams entering tidal water between The Haven, Baltray and Mornington Point, Co. Meath. The Boyne Catchment covers an area of c. 2,690 km<sup>2</sup> (EPA, 2021) (see Figure 10.6).

The Boyne Catchment is divided into 20 sub-catchments with the site located in the Boyne\_SC\_130 sub-catchment (ID 07\_17) draining a total local area of 67.13 km<sup>2</sup>.

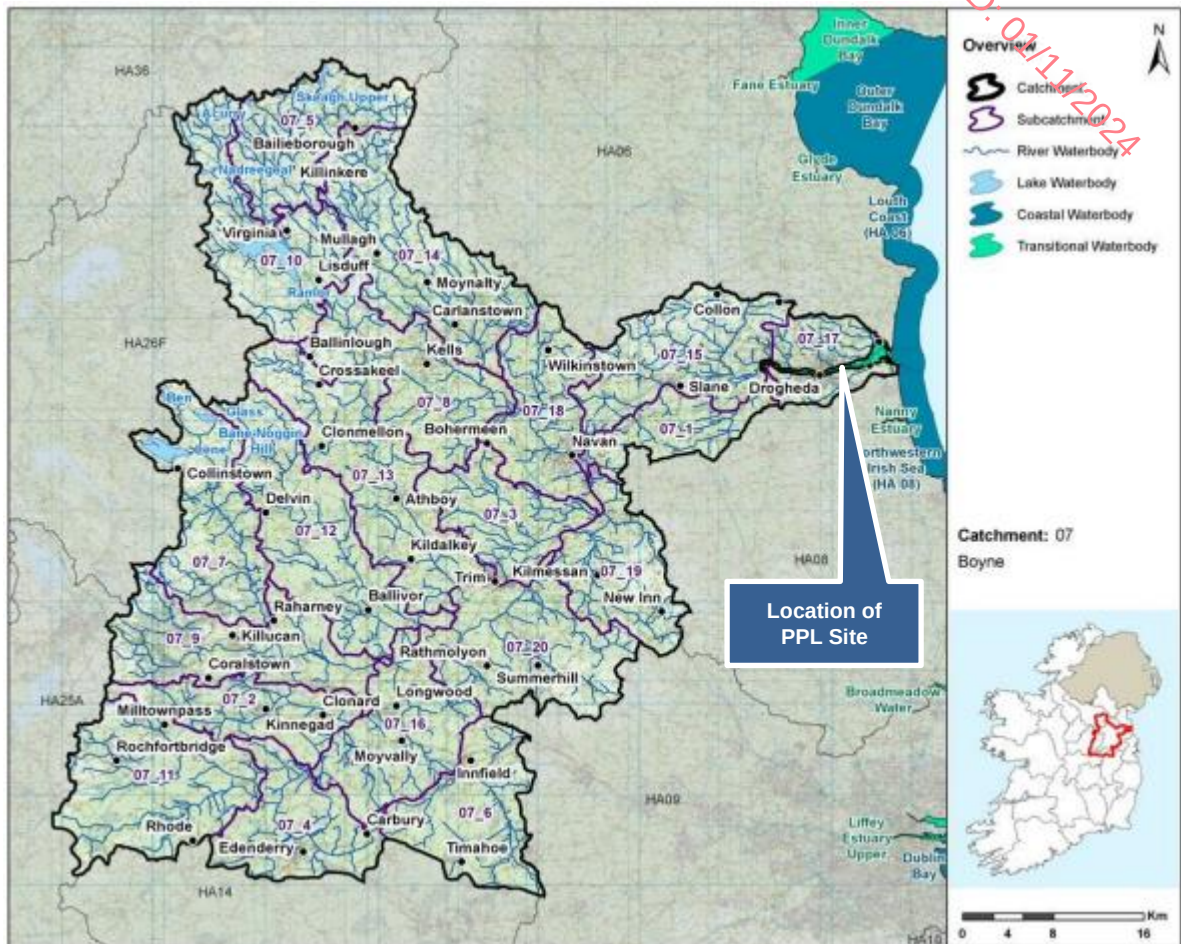


**Figure 10.6:** Extent of Boyne Catchment (HA 07) showing the location of the PPL Site (Extracted from EPA (2021) “3<sup>rd</sup> Cycle Draft, Boyne Catchment Report (HA 07), Catchment Science & Management Unit” <https://www.catchments.ie/data/> (accessed July 2024))

## 2. Surface Water Bodies

Figure 10.7 presents surface water bodies located within the vicinity of the development site. The closest surface water body to the site is the Boyne Estuary transitional water body (WFD Code: IE\_EA\_010\_0100), immediately to the south, flowing in an easterly direction. The Boyne Estuary discharges to the Boyne Estuary Plume Zone coastal water body (WFD Code: IE\_EA\_010\_0000) located within the Irish Sea c. 5 km downstream of the site.

The northern areas of Boyne\_SC\_130 sub-catchment are drained by a series of southward running rivers and streams (EPA Name: Tulleskar\_010 Sub-Basin), the closest of which is present within 200 m north and northeast of the site. This river runs in a southeastwardly direction from the north of the site and enters the Boyne Estuary approximately c. 400 m east of the site (see Figure 10.7).

Similarly, the southern area of Boyne\_SC\_130 sub-catchment on the opposite side of the Boyne Estuary, is drained by a series of northward running rivers and streams (EPA Name: Stragrennan\_010 Sub-Basin) (see Figure 10.7).

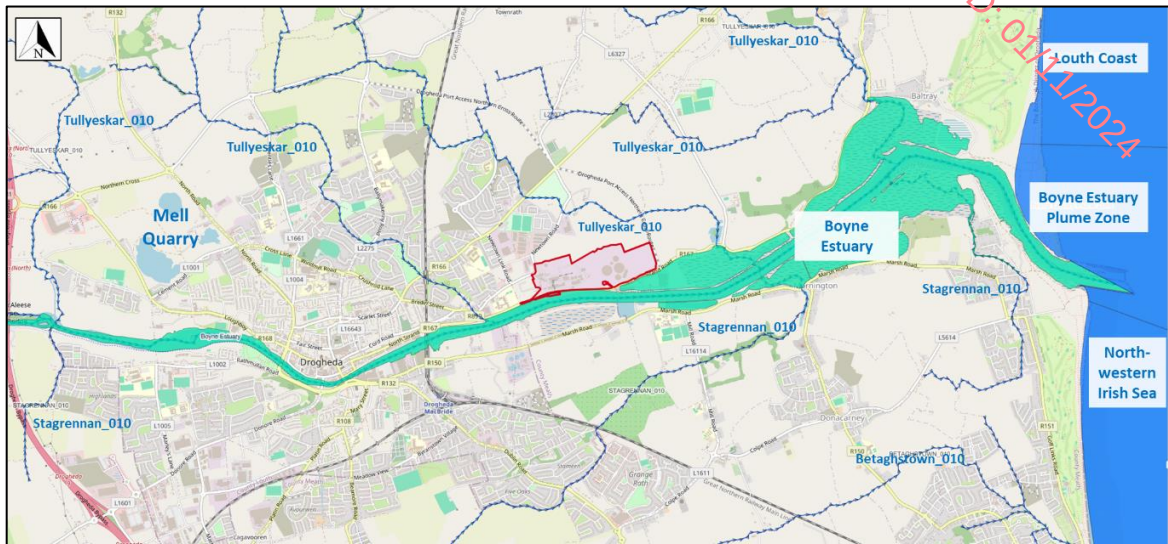


**Figure 10.7:** Surface Water Bodies in the vicinity of the PPL Site (denoted by red line boundary)  
(Source: EPA Maps)

Figure 10.8 presents the location of relevant discharges to surface water with associated receiving WFD surface water bodies listed below:

- Combined treated process wastewater and storm water collected from the manufacturing areas is discharged at IE Licensed emission point SW1 located c. 1.6 km from the coast within the **Boyne Estuary Plume Zone coastal water body**;
- Storm water collected from non-process areas, i.e., offices and car parking located in the western part of the PPL site, discharges to the **Boyne Estuary transitional water body** at an outfall location near the south-western corner of the site; and
- Foul wastewater collected at the site is conveyed to the Drogheda MWWTP. Treated wastewater from the Drogheda MWWTP ultimately outfalls at a primary discharge point located within the **Boyne Estuary transitional water body**.

In addition, Figure 10.8 presents the location of registered surface water abstraction points with associated WFD surface water bodies listed below:

- Freshwater intake from the **Boyne River water body** (Boyne\_180) at Littlegrange located c. 8.3 km upstream of the site; and
- Sea water intake from the **Boyne Estuary transitional water body** is located c. 3 km downstream of the site at Baltray Reservoir.



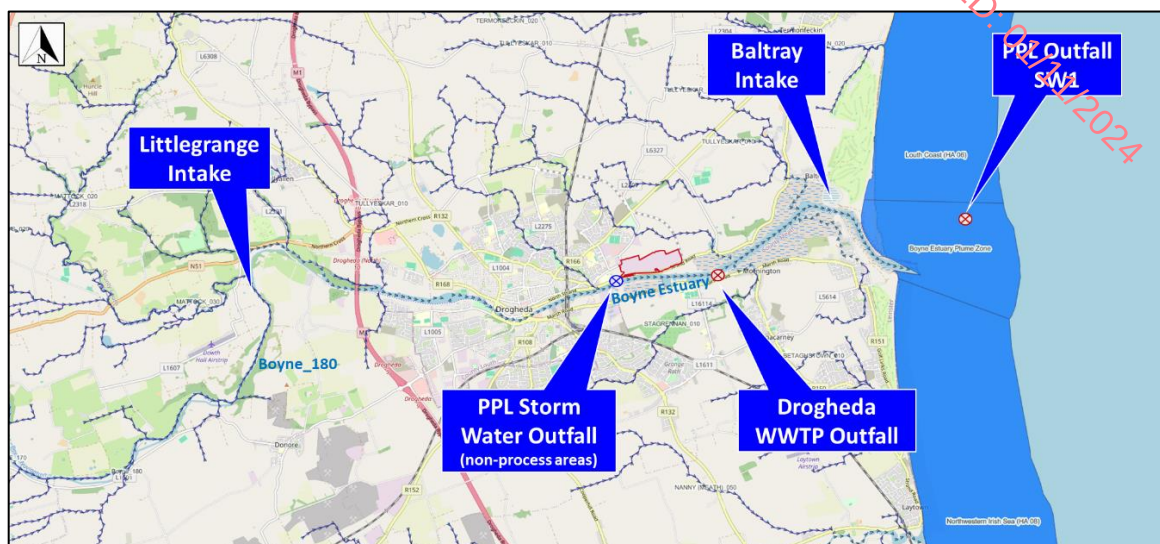


**Figure 10.8:** Location of relevant discharges to surface water and registered surface water abstraction points (Source: EPA Maps)

### 10.3.5 Surface Water Quality

#### 1. WFD Status

The WFD status of surface water bodies identified above are detailed in Table 10.6 and Figure 10.9.

**Table 10.6:** Surface Water WFD Status and Risk Categorisation

| WFD Water Body                             | Water Body Type | WFD Status (2016-2021) | Risk Categorisation <sup>1</sup> | Significant Pressures <sup>2</sup> |
|--------------------------------------------|-----------------|------------------------|----------------------------------|------------------------------------|
| Boyne Estuary<br>IE_EA_010_0100            | Transitional    | Moderate               | At Risk                          | UWW<br>Agriculture                 |
| Boyne Estuary Plume Zone<br>IE_EA_010_0000 | Coastal         | Moderate               | At Risk                          | Urban Run-off<br>Unknown           |
| Boyne_180<br>IE_EA_07B042200               | River           | Good                   | Not at risk                      | n/a                                |
| Tulleskar_010<br>IE_EA_07T270880           | River           | Moderate               | Under Review <sup>3</sup>        | n/a                                |
| Stragrennan_010<br>E_EA_07S320550          | River           | Moderate               | Under Review <sup>3</sup>        | n/a                                |

<sup>1</sup> Risk for each waterbody of failing to meet their WFD objectives by 2027

<sup>2</sup> For At Risk water bodies only

<sup>3</sup> Not enough evidence to determine if it is At Risk or Not at Risk

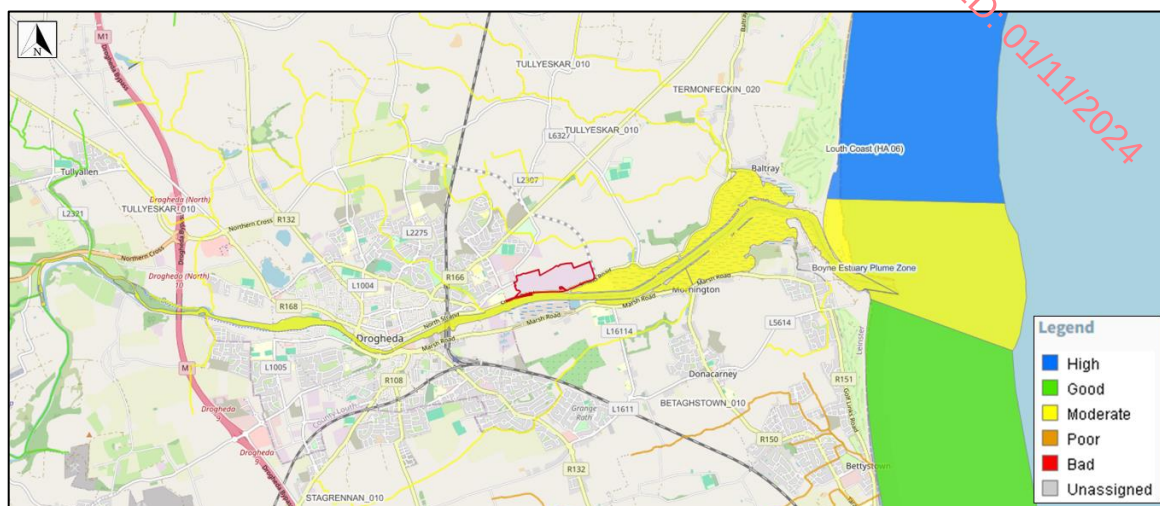


**Figure 10.9:** Surface Water WFD Status (Source: EPA Maps)

Based on the EPA River Waterbody WFD Status 2016-2021 (second cycle) map viewer, most of surface water bodies encountered within the study area (river, transitional and coastal water bodies), including the Boyne Estuary, are classified as 'Moderate' status. The river water body (Boyne\_180) where the Littlegrange freshwater intake point is located is classified as 'Good' and 'Not at risk' of failing to meet WFD Objectives by 2027.

The latest WFD Third-Cycle Boyne Catchment Report<sup>113</sup> states that the Boyne Estuary Transitional water body is 'At risk' of failing to meet WFD Objectives by 2027 due to significant pressure from agriculture and urban waste water.

## 2. River Boyne Biological Water Quality (Q-value)

The EPA<sup>114</sup> periodically monitors the biological water quality (Q-value) of the Boyne River at a number of different monitoring stations. The EPA Quality Rating (Q-value) System has been used to monitor the ecological quality of streams and rivers in Ireland since 1971. The Biological Quality Ratings (Q Values) are summarised in Table 10.7 below.

**Table 10.7:** Water Quality Biological Q Values

| Q Value*     | Water Framework Directive (WFD) Status | Pollution Status    | Condition**    |
|--------------|----------------------------------------|---------------------|----------------|
| Q5, Q4-5     | High                                   | Unpolluted          | Satisfactory   |
| Q4           | Good                                   | Unpolluted          | Satisfactory   |
| Q3-4         | Moderate                               | Slightly polluted   | Unsatisfactory |
| Q3, Q2-3     | Poor                                   | Moderately polluted | Unsatisfactory |
| Q2, Q1-2, Q1 | Bad                                    | Seriously polluted  | Unsatisfactory |

\* These Values are based primarily on the relative proportions of pollution sensitive to tolerant macro-invertebrates sampled from the river

\*\* Condition refers to the likelihood of interference with beneficial or potential beneficial uses.

The EPA Maps Viewer details biological water quality ratings for the Boyne River at a number of monitoring stations. Water quality ratings for the stations closest to the study area are provided in Table 10.8 (data accessed in June 2024).

**Table 10.8:** Biological Q Values at Monitoring Stations on the Boyne River

<sup>113</sup> EPA (2024). "Cycle 3 HA 07 Boyne Catchment Report"

<sup>114</sup> EPA online database (2024) EPA Maps. Available at <http://gis.epa.ie/> [last accessed June 2024]



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| Monitoring Station                                               | Q Value   |
|------------------------------------------------------------------|-----------|
| Oldbridge (RS07B042200) (ca. 7 km upstream of PPL Site)          | Q4 (2020) |
| Ford S of Broc Ho (RS07B042150) (ca. 15 km upstream of PPL Site) | Q4 (2012) |

Thus the EPA monitoring data indicates good biological water quality in the Boyne River upstream of the PPL site in the vicinity of the Littlegrange abstraction point. It is noted that there is no EPA River Biological Q Value monitoring data for the Boyne River downstream of the PPL site; however according to the EPA's Transitional Water Quality 2018-2020 dataset<sup>115</sup>, the Boyne estuary has a status of "potentially eutrophic".

### 3. Irish Sea Monitoring (Boyne Estuary Plume Coastal Water Body)

Treated effluent from the PPL site outfalls in the Irish Sea within the WFD Boyne Estuary Plume Zone coastal water body. In accordance with IE Licence conditions, PPL carry out chemical and biological surveys in the vicinity of the effluent discharge at emission point SW1 every three years. Monitoring results for chemical and biological surveys carried out in 2013 and 2022 are summarised below to describe the operational baseline scenario and the existing baseline scenario, respectively.

#### Operational Baseline Scenario<sup>116</sup> - Monitoring of effluent discharge to the Irish Sea in 2013

Enterprise Ireland conducted a survey of water and sediment chemistry, as well as sediment biology on July 10<sup>th</sup>, 2013 including collection of:

- Bottom sediment samples for biological analysis from seven different locations in the vicinity of the SW1 outfall (300 m North, 200 m North, 100 m North, Outfall, 100 m South, 200 m South and 300 m South);
- Sediments samples in the vicinity of the PPL SW1 outfall for chemical analysis (200 m North, 100 m North, 100 m South, 200 m South and 2 km East of the SW1 outfall point as the Control site); and
- Water samples in the vicinity of the PPL SW1 outfall from 1m below the surface and 1m above the sea bed at five different locations at both ebb and flood tide (200 m North, 100 m North, outfall, 100 m South and 200 m South).

The Enterprise Ireland report concludes that based on the water and sediment quality analysis and the biological data, the effluent discharge had no significant impact on environmental quality (the Enterprise Ireland 2013 Report is presented in the SLR Environmental Consulting Report which accompanies this planning application).

#### Existing Baseline Scenario<sup>117</sup> - Monitoring of effluent discharge to the Irish Sea in 2022

PPL commissioned AQUAFACT International Services Ltd. to conduct a chemical and biological survey in the vicinity of the discharge pipe outfall in 2022. A survey of water and sediment chemistry, as well as sediment biology was conducted on October 14<sup>th</sup>, 2022 including collection of:

- Bottom sediment samples for biological from seven different locations in the vicinity of the SW1 outfall (300 m North, 200 m North, 100 m North, Outfall, 100 m South, 200 m South and 300 m South);
- Sediments samples in the vicinity of the PPL SW1 outfall for chemical analysis (200 m North, 100 m North, 100 m South, 200 m South and 2 km East of the outfall point which was the Control site);

<sup>115</sup> This dataset shows water quality monitoring and assessments of Trophic Status carried out on Irish Transitional Waters for the Reporting period 2018-2020.

<sup>116</sup> This baseline scenario is representative of site conditions when the licensed activity is fully active c. 2014. Monitoring completed in 2013 is considered representative of this baseline scenario.

<sup>117</sup> This baseline scenario is representative of the existing site conditions with production activity at the facility scaled back pending the outcome of the current planning application. Monitoring completed in 2022 is considered representative of this baseline scenario.

- Water samples in the vicinity of the PPL SW1 outfall from 1m below the surface and 1m above the sea bed at five different locations at both ebb and flood tide (200 m North, 100 m North, outfall, 100 m South and 200 m South); and
- One final effluent sample provided by Premier Periclase Ltd for analysis.

The AQUAFAC report, which is presented in the SLR Environmental Consulting Report, concluded that:

- the benthic community analysis showed that all faunal species encountered are typical for the sediment type in the area, with no significant differences between the outfall and other sites, and all of the stations were classified as 'Undisturbed';
- the sediment analysis indicated that levels of Calcium, Magnesium, Nickel and Zinc near the outfall were lower than at the control site, except for higher Chromium at location 200 m South. Metal levels at all sites were generally at the lower end of the range found at Irish ports and harbours;
- the water sample analysis revealed slight, environmentally insignificant increases in Sulphate at location 100 m South on the ebb tide compared to the flood tide.

### 10.3.6 Protected Areas

#### 1. Natura 2000 Sites

Natura 2000 is a network of protected areas designated under the EU Birds Directive<sup>118</sup> and the EU Habitats Directive<sup>119</sup> to protect Europe's most valuable and threatened species and habitats. Natura 2000 sites identified within the study area are summarised in Table 10.9, Figures 10.10 and 10.11.

**Table 10.9:** Natura 2000 Sites within the Study Area

| European Site Name (Code)                               | Location relative to the Proposed Development Site                                                                         |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>Special Areas of Conservation (SAC)</b>              |                                                                                                                            |
| River Boyne and River Blackwater SAC (Site Code 002299) | Immediately adjacent the southern site boundary<br>Littlegrange surface water intake point is also located within this SAC |
| Boyne Coast and Estuary SAC (Site Code 001957)          | 80 m east                                                                                                                  |
| <b>Special Protection Areas (SPA)</b>                   |                                                                                                                            |
| Boyne Estuary SPA (Site Code 004080)                    | 40 m south and east                                                                                                        |
| North West Irish Sea SPA (Site Code 004236)             | 4.5 km east<br>Emission Point SW1 is located within this SPA                                                               |
| River Boyne and River Blackwater SPA (Site Code 004232) | 4.8 km west                                                                                                                |

<sup>118</sup> Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds

<sup>119</sup> Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

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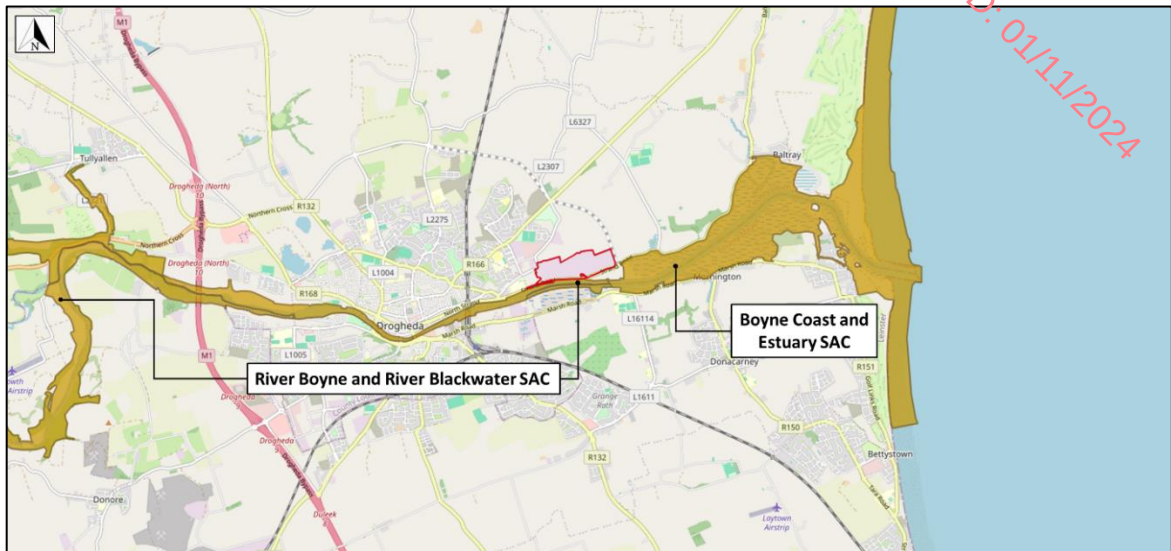


**Figure 10.10:** Location of Special Area of Conservation (SAC) Sites (Source: EPA Maps)

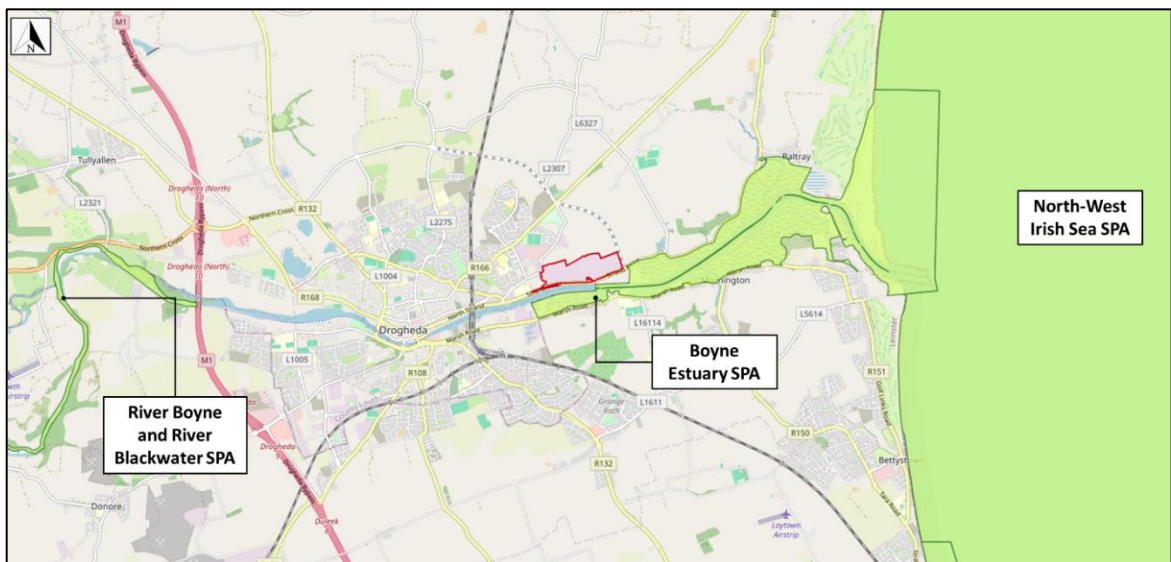


**Figure 10.11:** Location of Special Protection Areas (SPA) (Source: EPA Maps)

## 2. Drinking Water Protected River

The River Boyne (Boyne\_180 water body) is designated as a drinking water protected river in accordance with European Communities (Drinking Water) (No. 2) Regulations 2007 (S.I. no. 278/2007).

This protected area is located c. 7 km west of the site, however, the Littlegrange surface water intake point is located within the protected area (see Figure 10.12).

## 3. Salmonid Rivers

Salmonid Rivers are designated in accordance with European Communities (Quality of Salmonid Waters) Regulations 1988. The River Boyne (Boyne\_180 water body) is designated as a Salmonid River.

This protected area is located c. 7 km west of the site, however, the Littlegrange surface water intake point is located within the protected area (see Figure 10.12).

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#### 4. Bathing Water Areas

Bathing Water Areas are designated under S.I. No. 79/2008 and S.I. No. 351/2011 Bathing Water Quality (Amendment) Regulations 2011. Bathing Water Areas within the study area include (see Figure 10.12):

- Seapoint located c. 2.5 km north of the PPL outfall in the Irish Sea; and
- Laytown/Bettystown located c. 3.5 km south of the PPL outfall in the Irish Sea.

According to the EPA<sup>120</sup>, bathing water at both Seapoint and Laytown/Bettystown were classified as “Excellent” between 2020 and 2023.

#### 5. Shellfish Areas

Shellfish areas are designated in accordance with European Communities (Quality of Shellfish Waters) (Amendment) Regulations 2009. The Balbriggan\Skerries Shellfish area is located c. 3.5 km south of the PPL outfall in the Irish Sea (see Figure 10.12).

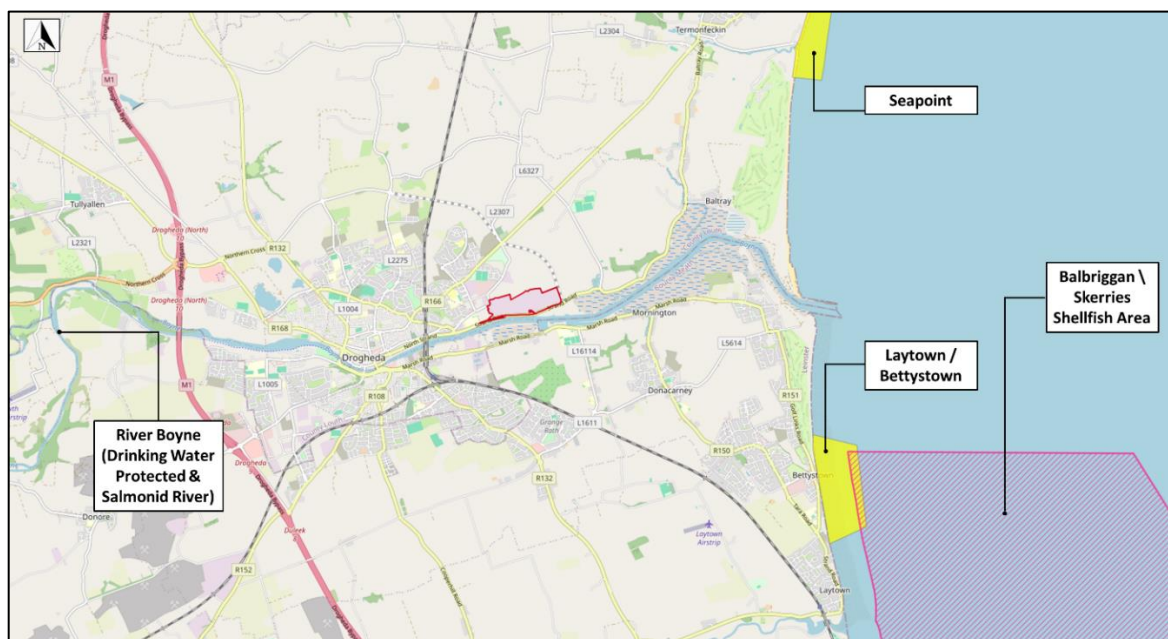


**Figure 10.12:** Location of Protected Areas (Source: EPA Maps)

#### 10.3.7 Flood Risk

AtkinsRéalis has completed a Stage 1 Flood Risk Assessment (FRA) for the Proposed Development site. The FRA report prepared by AtkinsRéalis (2024a) accompanies this planning application with a summary of the FRA provided here.

The FRA Report identified two possible sources of flooding at the site that may warrant further investigation:

- coastal flooding; and
- fluvial (or river) flooding.

The Office of Public Works (OPW) is the government agency with statutory responsibility for flooding in Ireland. The OPW website ([www.floodinfo.ie](http://www.floodinfo.ie)) includes CFRAM (Catchment Flood Risk Assessment and Management) flood maps for both fluvial and coastal flooding. The FRA Report states that:

<sup>120</sup> EPA (2024) “Bathing water quality in Ireland in 2023” [Bathing water quality in Ireland in 2023. | Environmental Protection Agency \(epa.ie\)](https://www.epa.ie/publications/reports/water/bathing_water_quality_in_ireland_in_2023/) (accessed August 2024)



- The CRFAM fluvial flood maps indicate that the maximum river level in that area reaches an estimated level of 3.049mOD for 1 in 100-year event and 3.198mOD for the 1 in 1000-year event. The main site has lowest levels of approximately 9.0mOD which is in excess of 6m freeboard.
- The CFRAM coastal flood maps indicate that the maximum coastal level in that area reaches an estimated level of 3.54mOD for 1 in 200-year event. The existing approximate average level of the Wharf at 3.40mOD is below this level by approximately 400mm, however, it is separated from the main site by the public road and is deemed a water compatible development.

While historical flood events indicate that there is a small section of road at the main entrance of the site that is liable to flooding for low probability events, additional access points are available to the north and southeast of the proposed site.

AtkinsRéalis also consulted the Strategic Flood Risk Assessment (SFRA) produced as part of the Louth County Development Plan (CDP) 2021-2027 which shows the Proposed Development site to be outside the extent of Flood Zone A<sup>121</sup> and Flood Zone B<sup>122</sup> with part of the existing wharf shown to be in Flood Zone B (Figure 10.13). As such, the main site is considered to be located within Zone C; low probability of flooding.

In summary, the AtkinsRéalis Stage 1 FRA concluded that the Proposed Development site is not at risk of flooding, and there is no requirement to progress to a Stage 2 Flood Risk Assessment.

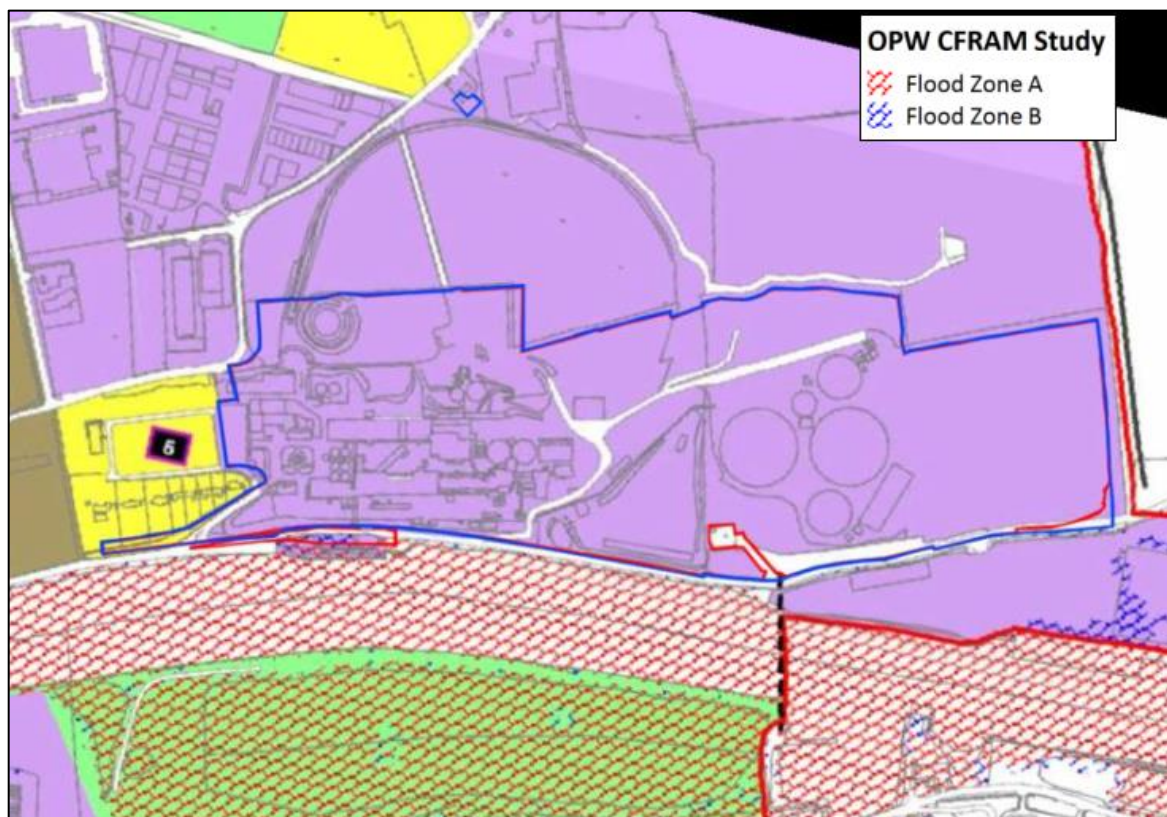


**Figure 10.13:** Louth County Predicted Flood Map (Extracted from AtkinsRéalis, 2024a)

### 10.3.8 Summary of Baseline Conditions

An overview of water and wastewater baseline conditions at the PPL site is presented in Table 10.10.

<sup>121</sup> Flood Zone A: where the probability of flooding is the highest (greater than 1% or 1 in 100 year for watercourse flooding or 0.5% or 1 in 200 for coastal flooding)

<sup>122</sup> Flood Zone B: where the probability of flooding is moderate (between 0.1% or 1 in 1000 year and 1% or 1 in 100 year for watercourse flooding, and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding).

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**Table 10.10:** Overview of Water and Wastewater Baseline Conditions at the PPL site

| Category                              | Baseline Conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Relevant Hydrological Feature                              |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| <b>Sanitary wastewater discharges</b> | Conveyed to Drogheda MWWTP for treatment prior to ultimate discharge to the Boyne Estuary.<br>Discharges comply with ELVs set by the EPA in accordance with relevant legislation to ensure environmental objectives for the receiving water body established under the WFD are achieved.                                                                                                                                                                                                             | Boyne Estuary transitional water body                      |
| <b>Process wastewater discharges</b>  | Spent seawater used in on site process is treated to reduce the pH and suspended solids prior to ultimate discharge to the Irish Sea at IE Licenced emission point SW1.<br>Discharges comply with ELVs set by the EPA in accordance with the IE Directive to ensure a high level of protection of human health and the environment.<br>Chemical and biological surveys carried out in the vicinity of the outfall location indicate no significant impact on environmental quality due to discharge. | Irish Sea<br>(Boyne Estuary Plume Zone coastal water body) |
| <b>Storm water discharges</b>         | Rainfall run-off collected from the production area undergoes clarification in the onsite settlement pond prior to mixing with treated process seawater and ultimate discharge at licenced emission point SW1.<br>Discharges comply with ELVs set by the EPA in accordance with the IE Directive to ensure a high level of protection of human health and the environment.                                                                                                                           | Irish Sea<br>(Boyne Estuary Plume Zone coastal water body) |
|                                       | Storm water collected from low risk non-process areas (i.e., offices and car parking) located in the western part of the PPL site discharges to the Boyne Estuary. This storm water has not come in contact with processing areas at the site.                                                                                                                                                                                                                                                       | Boyne Estuary transitional water body                      |
| <b>Water Supply</b>                   | Potable water facilities (canteen, toilets, etc.) at the site are supplied from Uisce Éireann mains water network.                                                                                                                                                                                                                                                                                                                                                                                   | River Boyne                                                |
|                                       | Abstraction of freshwater from both the River Boyne at Littlegrange and the disused Mell Quarry form a combined freshwater supply to the PPL site for industrial use. This freshwater abstraction regime is registered with the EPA.<br>The maximum daily abstraction volume of 3,434 m <sup>3</sup> /day at the Littlegrange intake point represents a small proportion of the River Boyne flows (a maximum of 0.78% at particularly low river flows, i.e. the 95 <sup>th</sup> ile flow).          | River Boyne                                                |
|                                       | Seawater abstracted from the Boyne Estuary at Baltray Pump House and reservoir is used in the process of Magnesium Hydroxide precipitation at the PPL facility and to reduce the pH of surface water runoff from the site. This seawater abstraction regime is registered with the EPA with maximum daily abstraction volume of 90,132m <sup>3</sup> /day.                                                                                                                                           | Boyne Estuary transitional water body                      |
| <b>Flood Risk</b>                     | The main development site is located outside Flood Zone A and Flood Zone B.<br>Stage 1 Flood Risk Assessment (AtkinsRéalis, 2024a) concludes that the Proposed Development is not at risk from flooding.                                                                                                                                                                                                                                                                                             | Boyne Estuary transitional water body                      |

In accordance with NRA Guidance (2008), the importance of relevant hydrological features have been determined based on baseline information with importance ratings for each summarised in Table 10.11.

**Table 10.11:** Importance Ratings for Relevant Hydrological Features

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| Hydrological Feature                                                                    | Importance     | Reason / Justification for Importance Rating                                                                                                                                                                                                          |
|-----------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Boyne Estuary transitional water body</b>                                            | Extremely High | Designated SAC and SPA<br><i>'Moderate'</i> WFD status and <i>'At risk'</i> of failing to achieve WFD objectives by 2027                                                                                                                              |
| <b>Boyne Estuary Plume Zone coastal water body</b><br><b>(North West Irish Sea SPA)</b> | Extremely High | Designated SPA<br>Designated Bathing Areas and Shellfish Area within a 5 km radius of PPL treated effluent outfall (IE Licenced Emission Point SW1)<br><i>'Moderate'</i> WFD status and <i>'At risk'</i> of failing to achieve WFD objectives by 2027 |
| <b>River Boyne upstream of the site at Littlegrange</b>                                 | Extremely High | Designated an SAC, a Drinking Water Protected River and a Salmonid River<br><i>'Good'</i> WFD status and <i>'Not at risk'</i> of failing to achieve WFD objectives by 2027                                                                            |

#### 10.4 Characteristics of the Proposed Development

The Proposed Development to which this planning application relates is the first phase of CORE, and will consist of extensive works that will transform the ca. 35.6 hectare site and set it on a path that will result in it becoming a sustainably powered enterprise campus. It is noted that the Proposed Development is unrelated to the existing Industrial Emissions licensed activity at the site. The Proposed Development consists of:

- The demolition of existing buildings, structures, and services associated with the PPL facility, as well as site clearance and remediation works.
- The careful sequestering of the licensed (inert) landfill onsite in accordance with all ongoing and future requirements of the EPA.
- A number of existing buildings and structures will be maintained as part of the Proposed Development, such as a Workshop Building, part of a Crane Store structure, 3 no. Lime Silos and water tanks and infrastructure, all of which have been incorporated into the design where beneficial and appropriate.
- The construction of a three storey Energy Centre (EC) building, a three storey Data Centre (DC) building, a single storey Facility Operations Centre (FOC) building, a single storey Pump and Filtration Building, a single storey Security Gatehouse and a Security Kiosk at the main site entrance of the site.
- The provision of a Battery Energy Storage System (BESS) Compound, an ESB Substation, a Cooling Compound, a Thermal Store Compound, a Pump and Filtration System, other ancillary structures including a Firewater Tank, a Fire Fighting Water Pump Building, a Control Building, a Maintenance Yard and Waste Management facilities. Ground-mounted solar Photo Voltaic (PV) arrays will also be provided on the existing licensed landfill and stockpile no. 3, along with 3 no. compact substations.
- The provision of all associated works including access arrangements, internal roadways and footpaths, car and cycle parking, boundary treatments, landscaping and services, and all ancillary works.

A detailed description of the Proposed Development is included in *Chapter 2 Description of Proposed Development* of this EIAR, which includes details of the demolition works required, details of the construction of the new buildings and structures, and details of the various elements that will make up the Proposed Development when it will be operational.

The following subsections provide details of the various phases of the Proposed Development which have the potential to give rise to effects on the surrounding water environment.

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#### 10.4.1 Construction Phase (including Demolition)

Activities during redevelopment and construction works with the potential to impact the water environment are detailed below.

##### 1. Demolition Works & Earthworks

Demolition phase activities with the potential to impact on surface water, primarily from suspended solids in run-off entering the site's storm water drainage system, include:

- isolation and removal of existing services from within building, identification and protection of any remaining live services;
- internal clear out of all debris, and existing plant from inside the structures;
- removal of all structures listed in the *Outline Demolition Method Statement* including the following key features:
  - Bagging Plant, Crane Store, Lower Stores, Office, Security Hut, Canteen;
  - Lime Kiln, Furnace, Pet Coke & Magnesium hydroxide Silos, Slaker Area, Cement & Silica Basins,
  - Periclase Shed, Mill House, Secondary Thickener Tanks, Conveyors, Wharf, Gantry;
  - Fresh Water Well, Fresh Water Basin, a number of Pump Houses, Boiler House, Acid Hut; and
  - HFO Silo and Tanks, Diesel and Kerosene Tanks, Oil Store, Bunds.
- breakout concrete slabs and foundations across site;
- crushing of demolition rubble to Class 6F2 fill material and infill of voids (created by removal of current structures), especially at Fresh Water Basin and Acid Bund, Thickener Tanks, Silica and Cement Basins;
- stockpiling of excavated contaminated material during remediation works of HFO impacted shallow soils located in the north-western and northern part of the site;
- general levelling of site to designed site contours using site won material;
- uncontrolled dewatering discharge (even if only short-term) could release potential contaminants to water environment; and
- removal of all arisings off-site including any recycled metal.

The *Outline Demolition Method Statement* prepared for the Proposed Development includes the following mitigation measures:

- Prior to commencing decommissioning and demolition works the existing site drainage network, including sumps and interceptors, shall be cleaned and inspected. Where necessary additional temporary drainage shall be installed to capture and control the run-off arising from the demolition works (road washing, dust control run-off, pipe-line cleaning etc.) in order to prevent contamination or deleterious materials entering water courses or the adjacent SAC/SPA;
- Drain points shall be identified prior to commencing and shall be managed as the works proceed to prevent flooding. Upon completion these are to be capped as required. Where it is expected that significant debris could enter the drains, they will be protected with filter material which will be replaced regularly;
- During crushing activities water and dust controls will be in place; and
- There will be no crushing of any demolition material at the wharf to prevent suspended sediment from going to the River Boyne.

In addition, a *Materials Management Plan*, prepared by the Environmental Consultant prior to the commencement of earthworks, will detail the preliminary soil management and sampling strategy during excavation of the former waste process material at Stockpiles 1, 2 and A, B and C. The document will include method statements for excavating, segregating, sampling, temporary



stockpiling (as required), and for any material deemed unsuitable for disposal within the licenced onsite landfill, a register of all proposed hauliers and disposal facilities will be maintained.

A *Construction Environmental Management Plan* (CEMP) will be implemented taking into account relevant good site practice during demolition and earthworks including:

- During earthworks, appropriate risk management measures will be implemented (e.g. stockpiling good practice including basal protection, bunding, cover systems, management of leachate water, capping layers);
- Direct discharge of sediment laden or contaminated water to adjacent surface water bodies will be forbidden; and
- Before commencement of construction and demolition works, localised temporary enabling works will be carried out at the existing stormwater pipeline, prior to the discharge point, to facilitate the installation of a temporary stormwater treatment system, as follows:
  - A Siltbuster treatment system or similar will be installed followed by a petrol interceptor, and the installation of a flap valve on the final manhole, prior to discharge to the River Boyne.
  - This temporary system will be in place for the full duration of the demolition and construction works, until the proposed drainage system has been installed and fully commissioned.
  - This will ensure that stormwater discharge from the site during the demolition and construction works will be treated prior to discharge to the River Boyne.
  - The temporary water treatment system will be subject to temporary works design by the Contractor, including all required system maintenance.
  - The temporary water treatment system will be subject to a daily visual inspection by the Contractor, to ensure optimum system performance.

## 2. General Construction Works

General construction activities have the potential to impact on the water environment as a result of:

- leakage/spillage of hydrocarbons or other chemicals stored at the site;
- leakage/spillage of fuels from construction machinery or during re-fuelling; and
- the use of concrete and cement products on site can present a contamination risk due to potential for uncontrolled release of washdown water/runoff.

The *Outline Demolition Method Statement* prepared for the Proposed Development includes the following mitigation measures:

- fuel oil for plant will be stored in double bunded tanks, their location will take into account features such as drainage systems. This will ensure, in the event of catastrophic failure, released liquids will be contained locally. Spill kits will be maintained near to fuel storage and refuelling areas; and
- chemicals will be stored in ventilated bunded areas. This will ensure, in the event of catastrophic failure, released liquids will be contained locally. Spill kits will be maintained near the storage area.

The *Construction Environmental Management Plan* (CEMP) will also include the above measures and include the following additional mitigation measures:

- Raw or uncured waste concrete will be collected and disposed of in an appropriate manner, and will not be discharged to any storm water sewer, drainage ditches or watercourses. Any concrete delivery trucks coming to the site to deliver concrete will be required to wash out their trucks at their own company depots; and
- Vehicle washdown will take place in designated areas and water will be recovered and tankered off-site weekly for final disposal/treatment by a licensed waste contractor.

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#### 10.4.2 Operational Phase

Proposed wastewater and storm water management, proposed water supply and activities during the operational phase with the potential to impact the hydrological environment are detailed below.

##### 1. Proposed Wastewater Drainage

###### Sanitary / Foul Wastewater

Sanitary wastewater collected from proposed buildings will be discharged via a pump station to the existing Uisce Éireann foul sewer at the main entrance on the western side of the site and conveyed to Drogheda MWWTP for treatment. The foul wastewater system will only be related to activity in the office buildings and not the EC or DC operations. All new foul sewers will be designed in accordance with the latest Uisce Éireann Code of Practice and Standard Details.

The predicted wastewater volume calculations are provided in a Pre-Connection Enquiry submitted to Uisce Éireann<sup>123</sup> with peak and average discharge estimated to be 0.286 l/s and 0.064 l/s, respectively. According to Meath's Wastewater Discharge Register, published by Uisce Éireann in June 2023, there is spare capacity available at Drogheda MWWTP. In accordance with Drogheda WWTP wastewater discharge licence Reg. no. D0041-01, discharges of treated effluent will comply with ELVs set by the EPA in accordance with relevant legislation to ensure environmental objectives for the receiving water body established under the WFD are achieved.

###### Process Wastewater

As there is no manufacturing type facility proposed as part of the development for which this planning application relates, no process effluent will be generated following development.

##### 2. Proposed Storm Water Drainage

The Proposed Development will be provided with a newly constructed storm water drainage network which will include Sustainable Drainage System (SuDS) measures, where possible, and will be both gravity fed and pumped due to the topographical nature of the site. Proposed SuDS measures include:

- Permeable paving;
- Swales;
- Tree Pits; and
- Attenuation tanks and flow controls with and without infiltration.

The incorporation of SuDS measures in the new storm water management system will serve to control the quantity of runoff to support the management of flood risk and also to treat the runoff to prevent the potential pollution of receiving waterbodies.

As detailed in the Civil Engineering Planning Report (AtkinsRéalis, 2024) accompanying this planning application, the overall storm water management strategy divides the development site into three drainage areas (see Figure 10.14):

- **Drainage Area 1:** Due to the significant level difference at the main entrance, storm water from access road will be directed to a soakaway to be located near the site entrance, which will be sized to accommodate a 100-year rainfall event including a 20% allowance for climate change. This storm water will be allowed to infiltrate to groundwater. An overflow connection to the existing storm water outfall near the south-western corner of the site will be provided for cases where the inflow exceeds the 100-year rainfall event. The overflow will be fitted with a bypass oil-water separator to filter out any hydrocarbons;
- **Drainage Area 2:** Storm water collected in the main area of the site will discharge to the Sand Hole via a flow control device to restrict the discharge rate. In addition, the storm water network in this area of the site will incorporate a number of storage structures, which will attenuate storm water flows to the Sand Hole. Collected storm water will be pumped from the Sand Hole

<sup>123</sup> Pre-Connection Enquiry is included in the Civil Engineering Planning Report accompanying this planning application (AtkinsRéalis, 2024)

- to the existing settlement pond to the east. From here, the clarified storm water will be pumped to the inner sump of the weir outfall, where it will mix with abstracted seawater prior to ultimate discharge to the Irish Sea via IE Licenced emission point SW1; and
- **Drainage Area 3:** This area currently has a network of small submersible pumps at low points to drain the area. It is proposed to replace these pumps with stoned areas which will drain to manholes and a proposed storm water network. The network will pass through hydrocarbon interceptors prior to being pumped to the existing settlement pond. From here, the clarified storm water will be pumped to the inner sump of the weir outfall, where it will mix with abstracted seawater prior to ultimate discharge to the Irish Sea via IE Licenced emission point SW1.

Site discharges of storm water at emission point SW1 will be subject to an ongoing sampling and monitoring regime in compliance with the site's IE Licence with monitoring samples collected on site at the weir outfall prior to discharge. Collected samples will be analysed to demonstrate compliance with ELVs set by the EPA in accordance with the IE Directive to control the release of pollutants in order to achieve a high level of protection of human health and the environment. Given the nature, volume and quality of the proposed discharge at emission point SW1 and the relative volume of water in the Irish Sea, it is considered that this discharge will not have an adverse effects on water quality or any protected sites which are hydrologically linked to the receiving water body.

Following development, storm water flows to the adjacent Boyne Estuary via the discharge point from Drainage Area 1 will be minimised with the discharge point only used during a 1:100 year return period storm event. It is considered that given the expected volume of storm water discharge directly to the Boyne River will be extremely low compared to any flow in the river and estuary, no adverse effects on water quality is predicted.



**Figure 10.14:** Proposed storm water drainage areas (Extracted from: AtkinsRéalis, 2024)

### 3. Proposed Firewater Run-off Retention

As the existing site operates under an IE Licence issued by the EPA, the site must comply with the 'EPA Guidance on Retention Requirements for Firewater Run-off' (2019). The site discharges storm water directly to a Natura 2000 site (North-West Irish Sea Special Protection Area (SPA) (site code: 004236)); therefore, in accordance with the EPA Guidance, firewater run-off retention is required at the site.

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The Civil Engineering Planning Report (AtkinsRéalis, 2024) accompanying this planning application (AtkinsRéalis, 2024) identifies one external location at the Proposed Development requiring contaminated firefighting run-off retention facilities; the BESS.

This area will be provided with sealed concrete pavements with upstands to prevent contaminated run-off discharging to ground. In addition, it is proposed to provide an underground attenuation / firewater retention tank under the BESS. In the case of a battery fire, the internal suppression systems of the batteries will be sufficient such that no firefighting water will be generated. In this case, contaminated water will arise from a possible fire at the BESS along with a rainfall event. As such, the retention tank has been sized to contain rainfall run-off from a 1 in 10-year, 24-hour storm event in accordance with EPA Guidance (2019). In addition, this retention tank will be fitted with a pH-controlled actuator on the outfall. Once contaminated water from a fire is detected, the outfall will close automatically turning it into a firewater run-off storage tank.

The Civil Engineering Planning Report (AtkinsRéalis, 2024) identifies two other internal locations that require consideration for contaminated firefighting run-off; the battery/UPS rooms and data halls for the DC and the battery/UPS rooms for the EC.

A separate foul sewer will be installed under the DC and EC to collect potentially contaminated firewater run-off in the event of a fire at either of these locations. It is proposed to pump any collected contaminated run-off to the firewater retention tank under the BESS which automatically shuts off the outfall during such an event.

Any potentially contaminated firewater run-off collected in the retention facilities provided during a fire event will be removed from the site by appropriately licensed waste contractors.

#### **4. Proposed Water Supply**

##### **Potable Water**

It is proposed to use the existing Uisce Éireann supply for potable water to the proposed buildings. This potable supply will be used to supply canteen and toilet facilities for the staff. There will be no requirement to use the public water supply for the DC and EC cooling system.

The proposed potable water demand requirements are listed in the Pre-Connection Enquiry submitted to Uisce Éireann which is included in the Civil Engineering Planning Report (AtkinsRéalis, 2024) accompanying this planning application. The peak demand is estimated at 0.326 l/s. A confirmation of feasibility without the need for an upgrade was received from Uisce Éireann, which is also included in the Civil Engineering Planning Report.

##### **Freshwater Supply**

The existing freshwater abstraction will continue to be operated as per the current situation on site. Abstracted freshwater from the Littlegrange and Mell Quarry intake regime will be used for the industrial processes within the site and discharged to sea via licenced emission point SW1 (except for the freshwater used for the DC cooling system, which will be released to air by evaporation). Ongoing abstraction of freshwater at Mell Quarry also serves to manage water levels in the disused quarry and prevents flooding of water abstraction infrastructure located on the eastern side of the quarry.

The recent enactment of the Water Environment (Abstractions and Associated Impoundments) Act 2022 and its associated Regulations (S.I. 418/2004 and SI 419/2004) is noted and will inform future licensing arrangements with the EPA.

It is proposed to use abstracted freshwater as a source for firewater supply. This supply will fill a 270 m<sup>3</sup> static firefighting storage tank to supply the firemain in the event of a fire. Abstracted freshwater will be used to refill the firefighting storage tank as required following system testing and use in fire events.

DC and EC heat will be rejected using a conventional cooling tower system as described in *Chapter 2 Description of Proposed Development*. For most of the year the cooling tower operates as a dry cooler, with no requirement for evaporative cooling, and therefore no freshwater requirements. However, during peak summer temperatures evaporative cooling is required, with



up to 240 m<sup>3</sup>/day of freshwater consumed, which will be sourced from the Littlegrange/Mell Quarry abstraction regime. The water used will be released by evaporation from the cooling towers.

Excess freshwater abstracted will overflow to the former seawater process tanks in the eastern part of the site which will, in turn, eventually overflow to the outfall weir on site for discharge to the Irish Sea via emission point SW1.

### **Seawater Supply**

The existing seawater abstraction and discharge infrastructure will continue to be operated as per the current situation on site. The existing large seawater process tanks located in the Tank Farm in the eastern part of the site will be retained, cleaned and reused as bulk seawater storage tanks.

The recent enactment of the Water Environment (Abstractions and Associated Impoundments) Act 2022 and its associated Regulations (S.I. 418/2004 and SI 419/2004) is noted and will inform future licensing arrangements with the EPA.

Abstracted seawater from Baltray Reservoir will be mixed with storm water run-off from the site to comply with IE Licence conditions. The storm water undergoes a settlement treatment process before being combined with seawater and is then discharged to sea via IE Licenced emission point SW1.

In addition, in the event that there is an internal UPS/battery fire and there is no freshwater supply, it is proposed to utilise the seawater stored in the former seawater process tanks as a secondary supply to the firemain.

### **Water for Closed Loop Cooling System**

The proposed closed loop cooling system will be filled using de-mineralised water (274 m<sup>3</sup>) sourced from specialist suppliers. Glycol will be mixed with the cooling water to a 20% concentration to prevent the freezing of the closed loop cooling system pipes on the roof of the DC during winter. A complete system flush out approximately every 10 years for maintenance purposes will be required. The drained cooling water will be tankered off site to a licensed waste/recovery facility.

## **5. Hazardous Material Storage**

Controls will be in place to prevent the uncontrolled release of hazardous substances to the environment. Hazardous materials stored at the Phase 1 CORE development, including diesel storage tanks adjacent the EC, will be stored and managed according to EPA 'IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities, 2004' to prevent an uncontrolled release of pollutants. All hazardous storage areas will be, as a minimum, bunded, either locally or remotely, to a volume not less than the greater of 110% of the capacity of the largest tank or drum within the bunded area; or 25% of the total volume of substance that could be stored within the bunded area.

As required by the site IE Licence, an Environmental Management System (EMS), incorporating a set of measures / practices to minimise environmental impact, will be implemented at the Proposed Development. The EMS will include site maintenance which will involve infrastructure performance checks that will capture integrity loss in drainage systems and secondary containment bunds. Spill response procedures will also be implemented as part of the site's EMS.

The proposed storm water attenuation tank located to the east of the DC, which collects rainfall from the roof of the DC, will have a secondary function as a glycol capture tank. Glycol will be mixed with the cooling water to a 20% concentration within the closed loop cooling system on the DC roof. Sensors will be placed in the DC downpipes which will activate actuators in the tank's outfall manholes in the case of a glycol spillage/rupture closing off the outfall and converting the attenuation tank to a retention tank. This attenuation tank has been sized to contain the spilled glycol solution and rainfall run-off from the 1 in 10-year, 24-hour storm event.

## **10.5 Potential Effects**

Embedded mitigation measures have been identified during the iterative EIA process and have been incorporated into the design and construction planning of the Proposed Development, as

detailed throughout Section 10.4. As these mitigation measures are embedded into the design, are legal requirements or are standard practices that will be implemented, the assessment of potential effects assumes that they are in place.

#### **10.5.1 Construction Phase (including Demolition)**

Potential effects on relevant hydrological features during the construction phase, including demolition, are assessed and described in accordance with NRA Guidance (2008) and EPA Guidance (2022) in Table 10.12.

No significant adverse residual effects on relevant hydrological features are predicted as a result of the construction phase of the Proposed Development. As such, construction phase activities will not affect the WFD objective of relevant water bodies to achieve 'Good' status by 2027.

#### **10.5.2 Operational Phase**

Potential effects on relevant hydrological features during operational phase are assessed and described in accordance with NRA Guidance (2008) and EPA Guidance (2022) in Table 10.13.

No significant adverse residual effects on relevant hydrological features are predicted as a result of the operational phase of the Proposed Development. As such, operational phase activities will not affect the WFD objective of relevant water bodies to achieve 'Good' status by 2027.

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**Table 10.12:** Assessment of potential effects on relevant hydrological features during the Construction Phase (including Demolition)

| Potential Effect Description                                                                                                                   | Receptor                   | Feature Importance | Magnitude  | Quality  | Significance  | Duration  | Likely Significant Adverse Effects |
|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------|------------|----------|---------------|-----------|------------------------------------|
| Potential deterioration in surface water quality due to contaminated run-off during demolition works / earthworks / general construction works | Boyne Estuary (SACs & SPA) | Extremely High     | Negligible | Negative | Imperceptible | Temporary | No Significant Effects Identified  |
| Potential deterioration in surface water quality due to contaminated site discharge at IE Licenced emission point SW1                          | Irish Sea (SPA)            | Extremely High     | Negligible | Negative | Imperceptible | Temporary | No Significant Effects Identified  |

**Table 10.13:** Assessment of potential effects on relevant hydrological features during the Operational Phase

| Potential Effect Description                                                                                                                                                  | Receptor                    | Feature Importance | Magnitude  | Quality  | Significance  | Duration  | Likely Significant Adverse Effects |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--------------------|------------|----------|---------------|-----------|------------------------------------|
| Potential deterioration in surface water quality due to uncontrolled release / contaminated firewater run-off                                                                 | Boyne Estuary (SACs & SPA)  | Extremely High     | Negligible | Negative | Imperceptible | Temporary | No Significant Effects Identified  |
| Potential deterioration in surface water quality due to contaminated site discharge at IE Licenced emission point SW1                                                         | Irish Sea (SPA)             | Extremely High     | Negligible | Negative | Imperceptible | Temporary | No Significant Effects Identified  |
| Reduction in upstream River Boyne flows due to freshwater abstraction for site use (Freshwater abstraction will continue to be operated as per the current situation on site) | River Boyne at Littlegrange | Extremely High     | Negligible | Neutral  | Imperceptible | Long-term | No Significant Effects Identified  |

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## 10.6 Mitigation Measures and Monitoring of Effects

### 10.6.1 Mitigation Measures

As detailed in Section 10.5, no likely significant adverse effects have been identified during assessment of potential effects on relevant hydrological features during construction and operational phases. In order to minimise and, where possible, eliminate potential effects on surrounding water environment mitigation measures have been incorporated into the design and construction planning of the Proposed Development and are summarised below.

#### Construction Works (including Demolition)

Mitigation measures to prevent adverse effects on hydrological features during the construction phase include:

1. Prior to commencing decommissioning and demolition works the existing site drainage network, including sumps and interceptors, shall be cleaned and inspected. Where necessary additional temporary drainage shall be installed to capture and control the run-off arising from the demolition works (road washing, dust control run-off, pipe-line cleaning etc.) in order to prevent contamination or deleterious materials entering water courses or the adjacent SAC/SPA;
2. Drain points shall be identified prior to commencing demolition works and shall be managed as the works proceed to prevent flooding. Upon completion these are to be capped as required. Where it is expected that significant debris could enter the drains, they will be protected with filter material which will be replaced regularly;
3. During crushing activities water and dust controls will be in place;
4. There will be no crushing of any demolition material at the wharf to prevent suspended sediment from going to the Boyne Estuary;
5. Excavated material will be stored away from drains within the site and silt control measures put in place. Excavated material, where not being reused on site, will be removed off site as soon as possible in accordance with the requirements of waste legislation. The main contractor will be responsible for the management of excavated material and the safe disposal of this material to a suitably licenced waste disposal facility.
6. During earthworks, appropriate risk management measures will be implemented (e.g. stockpiling good practice including basal protection, bunding, cover systems, management of leachate water, capping layers);
7. Direct discharge of sediment laden or contaminated water to adjacent surface water bodies will be forbidden;
8. Before commencement of construction and demolition works, localised temporary enabling works will be carried out at the existing stormwater pipeline, prior to the discharge point, to facilitate the installation of a temporary stormwater treatment system, as follows:
  - A Siltbuster treatment system or similar will be installed followed by a petrol interceptor, and the installation of a flap valve on the final manhole, prior to discharge to the River Boyne.
  - This temporary system will be in place for the full duration of the demolition and construction works, until the proposed drainage system has been installed and fully commissioned.
  - This will ensure that stormwater discharge from the site during the demolition and construction works will be treated prior to discharge to the River Boyne.
  - The temporary water treatment system will be subject to temporary works design by the Contractor, including all required system maintenance.
  - The temporary water treatment system will be subject to a daily visual inspection by the Contractor, to ensure optimum system performance.



9. Fuel for plant will be stored in double bunded tanks, their location will take into account features such as drainage systems. This will ensure, in the event of catastrophic failure, released liquids will be contained locally. Spill kits will be maintained near to fuel storage and refuelling areas;
10. Chemicals will be stored in ventilated bunded areas. This will ensure, in the event of catastrophic failure, released liquids will be contained locally. Spill kits will be maintained near the storage area;
11. Raw or uncured waste concrete will be collected and disposed of in an appropriate manner, and will not be discharged to any storm water sewer, drainage ditches or watercourses. Any concrete delivery trucks coming to the site to deliver concrete will be required to wash out their trucks at their own company depots;
12. Vehicle washdown will take place in designated areas and water will be recovered and tankered off-site weekly for final disposal/treatment by a licensed waste contractor; and
13. All conditions relating to water and wastewater contained within the site's existing IE Licence (Reg. No. P0376-02) will be adhered to during the construction phase.

#### Operational Phase

Mitigation measures to prevent adverse effects on hydrological features during operational phase include:

1. As detailed in the Civil Engineering Planning Report included in this planning application, firewater run-off retention capacity, which automatically shuts off the tank outfall during a fire event, will be installed as part of the redevelopment works preventing loss of potentially contaminated firewater run-off to surface water in the event of a fire;
2. All hazardous storage areas will be, as a minimum, bunded, either locally or remotely, to a volume not less than the greater of 110% of the capacity of the largest tank or drum within the bunded area; or 25% of the total volume of substance that could be stored within the bunded area;
3. As required by the site IE Licence, an Environmental Management System (EMS), incorporating a set of measures / practices to minimise environmental impact, will be implemented at the Proposed Development and will include site maintenance which will involve integrity testing of drainage systems and secondary containment bunds as well as spill response management procedures;
4. All conditions and emission limit values (ELVs) relating to water and wastewater contained within the site's IE Licence will be adhered to during the operational phase; and
5. In addition to the mitigation measures proposed, design of the Proposed Development incorporates SuDS measures and attenuation structures with flow controls in the proposed storm water management system. This will control the quantity of runoff to support the management of flood risk.

### **10.6.2 Monitoring**

#### Construction Works (including Demolition)

Site discharges at IE Licenced emission point SW1 will be subject to an ongoing sampling and monitoring regime in compliance with the site's IE Licence with monitoring samples collected on site at the weir outfall prior to discharge.

#### Operational Phase

Following redevelopment of the site, site discharges at IE Licenced emission point SW1 will be subject to an ongoing sampling and monitoring regime in compliance with the site's IE Licence.

### **10.7 Potential Cumulative Effects**

Cumulative effects may result by the addition of many minor or insignificant effects from the Proposed Development and other relevant projects to create larger, more significant effects.

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Relevant planned or permitted developments within the vicinity and context of the Proposed Development are outlined in Section 2.10 in *Chapter 2 Description of Proposed Development* of this EIAR and include:

- Large Scale Residential Development (LRD) (LCC Planning Ref.: 2360053);
- Self Storage Facility (LCC Planning Ref.: 2360137);
- Boyne Mill Commercial / Residential Development (LCC Planning Ref.: 2288);
- New Apartment Development, Cord Road (LCC Planning Ref.: 22504, An Bord Pleanála (ABP) Ref.: 316379-23);
- Port Access Northern Cross Route (PANCR);
- Part 8 – Road Construction (LCC Planning Ref.: 21600);
- Permission for an Office Extension (LCC Planning Ref.: 211000); and
- Permission for a cargo warehouse building (LCC Planning Ref.: 20733).

#### 10.7.1 Construction Works (including Demolition)

Given the low level of residual effects on hydrological features associated with the construction phase, there will be limited potential for cumulative effects to arise.

Concurrent construction works at the site and other development sites will be completed in accordance with project-specific CEMPs. The necessary environmental protection measures in compliance with legislative requirements and best practice will be implemented to protect and minimise the effects on the local water environment such that no significant cumulative effects are predicted.

#### 10.7.2 Operational Phase

Given the low level of residual effects on hydrological features associated with the operational phase of the Proposed Development, there will be limited potential for cumulative effects to arise.

Increase in wastewater loading at Drogheda MWWTP and increase in mains water supply is an effect of all developments. Each development will require approval from Uisce Éireann confirming available capacity in the water and wastewater infrastructure. The storm water and foul drainage infrastructure and water supply requirements for the Proposed Development have been designed and assessed to accommodate the requirements of the Proposed Development.

All developments will be required to manage any discharges to water and operate in compliance with relevant legislation such that there will be no likely cumulative effect on water quality.

It is noted that development at nearby sites may result in an increase in hardstanding / building footprint which, together with the Proposed Development, could result in an increased storm water run-off rate. However, each permitted development is required by the Local Authority and Uisce Éireann to provide suitable attenuation / SuDS measures in order to maintain and protect the natural water cycle and decrease the risk of off-site flooding as a result of development such that no significant cumulative effects are predicted.

#### 10.7.3 Possible Future Phases of CORE

As described in *Chapter 2 Description of Proposed Development* of this EIAR, the Proposed Development to which this planning application relates is the first phase of CORE. Given the level of detail available on possible future phases of CORE, it is not possible to carry out a detailed cumulative impact assessment for the construction and operational phases with the future phases at this time.

Potential future phases of development will be subject to separate planning applications, environmental impact assessment and, where relevant, Industrial Emissions Licensing by the EPA. Future phases of the development may require additional mitigation measures to protect relevant hydrological features. These measures will be identified and detailed as part of the detailed design,

planning and EIAR for any additional respective phases of the development to ensure the potential future phases do not have any significant adverse effect on the receiving geological and hydrogeological environment.

Furthermore, any subsequent EIAR's for a future phase of development will cumulatively assess any existing phases at that time.

## **10.8 'Do Nothing' Scenario**

At present production activity at the PPL facility has been scaled back pending the outcome of the current planning application. This is referred to as the 'Existing Baseline Scenario'.

The 'Operational Baseline Scenario' is a scenario where the site was fully operational similar to operations in 2014 when there was peak production at the site. Should the Proposed Development not proceed, PPL propose to continue to operate as a magnesia and magnesium hydroxide production facility in compliance with IE Licence Reg. No. P0376-02, issued by the EPA, with production reverting to peak production capacity.

In the 'Do Nothing' scenario potential effects associated with the construction phase of the Phase 1 CORE development would not happen.

### **10.8.1 'Do Nothing' Effects**

In the 'Do Nothing' scenario, the PPL site would continue to operate in compliance with the site's IE Licence which includes conditions and ELVs in order to ensure a high level of protection of human health and the environment.

As such, no significant adverse effects on the local water environment are predicted considering the 'Do Nothing' scenario.

## **10.9 Residual Effects**

### **10.9.1 Construction Works (including Demolition)**

Potential effects on relevant hydrological features during construction phase are assessed and described in accordance with NRA Guidance (2008) and EPA Guidance (2022) in Section 10.5.1.

No significant adverse residual effects on relevant hydrological features are predicted. As such, there will be no significant effects on the WFD status of relevant water bodies as a result of the construction of the Proposed Development.

### **10.9.2 Operational Phase**

Potential effects on relevant hydrological features during operational phase are assessed and described in accordance with NRA Guidance (2008) and EPA Guidance (2022) in Section 10.5.2.

No significant adverse residual effects on relevant hydrological features are predicted. As such, there will be no significant effects on the WFD status of relevant water bodies as a result of the Proposed Development.

## **10.10 Difficulties Encountered During Preparation of this Chapter**

There were no difficulties encountered in compiling this Chapter of the EIAR.

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## 11 Air Quality

### 11.1 Introduction

This chapter has been prepared to assess the potential effects on Air Quality from the proposed development during construction and operational phases at the Premier Periclase Ltd. (PPL Site at Boyne Avenue, Newtownstalan, Drogheda Co. Louth. This chapter should be read in conjunction with *Chapter 2 Description of the Proposed Development*, *Chapter 6 Traffic and Transportation*, *Chapter 7 Soils, Geology and Hydrogeology*, *Chapter 8 Biodiversity* and *Chapter 12 Climate* of this Environmental Impact Assessment Report (EIAR).

The construction phase of the Proposed Development will involve demolition, excavation and earthmoving activities, temporary stockpiling of excavated materials along with associated construction traffic. These activities could give rise to dust emission during dry conditions. Construction vehicles, in addition to exhaust emissions, also have the potential to create occasional dust emissions, particularly during dry weather. Appropriate site management procedures will be implemented as part of the Construction Environmental Management Plan to minimise all construction related emissions to air. These will include sweeping of hard-surfaced roads, as appropriate; dampening of site roads as necessary; provision of suitable facilities for vehicle cleaning to prevent the carriage of mud and other wastes if required and operating only mechanically sound vehicles that are switched off when not in use. These mitigation measures, will lead to a low residual effect of dust emissions due to construction activities.

A detailed description of the Proposed Development is included in *Chapter 2* of the EIAR.

In relation to operational emissions to atmosphere, the Proposed Development includes nine 4.5 MW (electrical output) gas engines. The new engines will generate emissions of oxides of nitrogen (NO<sub>x</sub>)<sup>124</sup> and carbon monoxide (CO).

The Energy Centre (EC) operates at Medium Voltage (MV) and provides a mix of onsite renewable generation, energy storage, gas generation, and power conditioning.

The development includes a Battery Energy Storage System (BESS) and significant Photovoltaic (PV) arrays. An Uninterruptable Power Supply (UPS) will be included in the event of power disruption from the on-site or grid electrical supplies. Reserve power is provided by the nine no. gas engines.

Air dispersion modelling was performed in order to predict the maximum ground level concentrations (GLCs) of pollutants in the waste gases from the engines.

It is noted that proposed gas engines will not operate continuously and operation will be constrained to operate only when it is beneficial when compared to the national grid or in reserve (expected to be approximately 5-10% of the hours of the year). As the actual hours of operation of the gas engines are unknown at this point the air dispersion modelling has conservatively included all nine gas engines running continuously 24/7.

Therefore, this assessment uses a suitably conservative approach, as it does not take into account the integration of onsite renewable generation, energy storage or utilisation of grid electricity, which enables the reduction/elimination of emissions from the development due to the reduced operation of the gas engines.

Existing air emission points at the PPL facility which are included within the current Industrial Emissions (IE) Licence (Reg. No. P0376-02) are not taken into account as these would not be operational if the Proposed Development was to proceed. Existing air emission points at the facility are taken into account in the Operational Baseline Scenario.

Other operational emissions to atmosphere from the Proposed Development are related to operational traffic emissions which are also assessed in this chapter.

<sup>124</sup> Complex chemical reactions with ozone take place during which a portion of the Nitrogen Oxide is converted to Nitrogen Dioxide (NO<sub>2</sub>)



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## 11.2 Assessment Methodology

### 11.2.1 Assessment

The assessment was carried out using procedures described in the EPA EIA Guidelines outlined in *Chapter 1 Introduction* of this EIAR and the following:

- EPA (2020) "Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)", Version 2;
- Transport Infrastructure Ireland (TII) (formerly National Roads Authority) (2022) "Air quality Assessment of Proposed National Roads";
- Institute of Air Quality Guidance (IAQM) (2024) "Assessment of Dust from Demolition and Construction V2.2".

The assessment involved:

- Determining the air quality in the general area of the Proposed Development;
- Characterisation of the emissions to air from the Proposed Development based upon their source and nature with due regard taken of the assessment procedures outlined in the above referenced guidance documents.

#### Air Dispersion Modelling

- Identifying the relevant ambient air quality standards and performing air dispersion modelling to predict the effect of operational emissions upon air quality.

#### Assessment of Dust

- Determining the potential dust emission magnitude in relation to works associated with demolition, earthworks, construction and track out;
- Defining the sensitivity of the area, accounting for specific sensitive receptors proximity, quantity and local background particulate matter (PM<sub>10</sub>) concentrations;
- Determining the potential dust risk effect to define site-specific mitigation measures.

### 11.2.2 Environmental Assessment Levels – Air Quality Standards

Air quality standards (AQS) for the protection of human health and the environment have been developed at European level and implemented into Irish legislation for a number of atmospheric pollutants<sup>125</sup>. The AQS set limit values for Ground Level Concentrations (GLCs) of certain pollutants for both the short term (hourly, daily) and long term (annual averages) averaging periods. Limit values are often expressed as percentiles e.g. 98<sup>th</sup> percentile of mean hourly values, which means that only 2% of the results obtained during the monitoring period can exceed the stated limit value.

The following ambient air quality legislation is currently implemented in Ireland:

- Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009 (S.I. No. 58/2009) which implement EU Directive 2004/107/EC<sup>126</sup>. These regulations set target values in ambient air to be attained, from 31 December 2012, for concentrations of arsenic, cadmium, nickel and benzo(a)pyrene (a measurable indicator of the level of polycyclic aromatic hydrocarbons) and also specify monitoring requirements for mercury and other polycyclic aromatic hydrocarbons;
- Air Quality Standards Regulations 2022 (S.I. No. 739 of 2022)<sup>127</sup> which implement the Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC). This Directive merges most of the previous directives (Directives 96/62/EC, 1999/30/EC, 2000/69/EC and 2002/3/EC)

<sup>125</sup> Available at <https://airquality.ie/information/air-quality-standards> [accessed August 2024].

<sup>126</sup> The Commission Directive (EU) 2015/1480 amended several annexes to Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council. These amendments relate to the rules concerning reference methods, data validation, and the location of sampling points for assessing ambient air quality.

<sup>127</sup> The Ambient Air Quality Standards Regulations 2022 (S.I. No. 739 of 2022) replace and revoke the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011).

into a single directive. The regulations set ambient air quality limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, benzene, lead and particulate matter (PM<sub>10</sub>/PM<sub>2.5</sub>). Table 11.1 details air quality limit values relevant to the Proposed Development.

**Table 11.1:** Relevant Air Quality Standard (AQS) Limit Values

| Pollutant                                               | AQS (µg/m <sup>3</sup> ) | Source of AQS Value                        |
|---------------------------------------------------------|--------------------------|--------------------------------------------|
| <b>Nitrogen Dioxide (NO<sub>2</sub>)</b>                |                          |                                            |
| 1-hour mean (99.8% Percentile)                          | 200                      | EU Directive 2008/50/EC / S.I. 739 of 2022 |
| Annual mean                                             | 40                       | EU Directive 2008/50/EC / S.I. 739 of 2022 |
| <b>Oxides of Nitrogen (NO<sub>x</sub>)</b>              |                          |                                            |
| Annual mean for protection of vegetation and ecosystems | 30 <sup>128</sup>        | EU Directive 2008/50/EC / S.I. 739 of 2022 |
| <b>Carbon Monoxide (CO)</b>                             |                          |                                            |
| 8 hour mean                                             | 10,000                   | EU Directive 2008/50/EC / S.I. 739 of 2022 |

### 11.2.3 Air Dispersion Modelling

The assessment was carried out using BREEZE air dispersion modelling software (version 10.0), which implements US EPA AERMOD software version 21112. The air dispersion modelling input data consists of meteorological data, detailed information on the physical environment (including building dimensions and terrain features) and design details from emission points on-site as provided by AtkinsRéalis & Clarke Energy (gas engine suppliers). Using this input data, the model predicts ambient ground level concentrations beyond the site boundary for each hour of the modelled meteorological years (2017-2021). The model post-processes the data to identify the location and concentration of the worst-case ground level concentrations. The modelling and reporting methodology carried out was based on the requirements of the Irish Environmental Protection Agency (EPA) *Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)* (2020).

#### Dispersion Model

Using the input data referred to above, the model predicts ground level concentrations of pollutants beyond the site boundary for each hour of the modelled meteorological years. The model post-processes the data to identify the location and concentration of the worst-case ground level concentrations.

<sup>128</sup> The Regulations and Directive state that a sampling point targeted at the protection of vegetation and natural ecosystems shall be sited more than 20km from agglomerations or more than 5km away from other built-up areas, industrial installations or motorways or major roads with traffic counts of more than 50,000 vehicles per day.

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### Meteorological Data

The meteorological data required by the dispersion model are wind speed, wind direction, Pasquill-Gifford stability category, boundary layer height and ambient temperature. The stability category and boundary layer height are used to characterise the turbulence within, and the height of the lower levels of the atmosphere.

Extremely unstable conditions can cause plume looping and elevated concentrations close to the stack. Under stable conditions, elevated concentrations can occur due to the emissions being trapped below the boundary layer. Neutral conditions, characterised by cloudy skies and strong winds, are most favourable for dispersion due to the mechanical mixing of the lower atmosphere. The wind direction determines the direction in which the plume is blown, and for a particular stability, higher wind speeds will result in reduced plume rise so causing the plume to reach ground level closer to the stack with elevated emission concentrations. The boundary layer height determines the total vertical distance over which the plume may spread.

### Building Downwash

Air streams blowing across buildings can become disrupted, with turbulent eddies occurring downwind in the building wake. If an emission point is sufficiently close to a building, then the plume may become entrained in the turbulent eddies of the building wake.

This entrainment can cause plume downwash resulting in elevated emission concentrations close to the emission point. The stack modelled is subject to downwash and, as a result, direction specific building dimensions were calculated.

The AERMOD model interprets the influence zone of each building for a given wind direction using the Building Profile Input Program (BPIP). All of the main buildings on the site were included in the modelling analysis, including warehouses, office/labs area, production building, etc. Details of all buildings included in the AERMOD model are outlined in Table 11.2.

**Table 11.2:** Structures included in the model to account for Building downwash and approximate heights

| Structure Description                     | Ground Elevation (m) | Structure Height (m) |
|-------------------------------------------|----------------------|----------------------|
| Retained Workshop Building                | 14.55                | 6.0                  |
| Data Centre                               | 10.70                | 28.8                 |
| Security Gate and Airlock 1               | 11.07                | 4.0                  |
| Security Gate and Airlock 2               | 10.165               | 3.5                  |
| Energy Centre                             | 11.495               | 26.5                 |
| Facilities Operations Centre (FOC)        | 11.495               | 6.2                  |
| Bulk Storage Compound                     | 13.30                | 4.5                  |
| Pump & Filtration Building                | 12.30                | 7.0                  |
| Retained Process Tank (A)                 | 10.10                | 2.0                  |
| Retained Process Tank (B)                 | 9.80                 | 2.0                  |
| Retained Process Tank (C)                 | 10.00                | 3.0                  |
| Retained Process Tank (D)                 | 10.40                | 3.3                  |
| Retained Process Tank (E)                 | 9.90                 | 1.8                  |
| Weir Outlet                               | 10.00                | 3.5                  |
| Existing Pump House 2                     | 9.9                  | 6.2                  |
| Existing Transformers & Tank Farm Canteen | 10.2                 | 6.2                  |

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### Receptors

The model was set up to examine the effect of emissions on the area surrounding the site of the proposed facility using a series of receptors. A receptor is a location at which the model will calculate maximum ground level process contributions. A cartesian co-ordinate receptor grid system was established with its centre at the centre of the site. For the coarse grid, receptors were placed at 500 m intervals over a 20 km by 20 km grid centred on the site, giving a total of 1,600 receptor points on the coarse grid. For the fine grid, receptors were placed at 100m intervals over a 4 km by 4 km grid centred on the site, giving a total of 441 receptor points on the fine grid. Figure 11.1 shows the built model and receptor grid of each scenario modelled.

### Terrain

Terrain height for all of the model elements was input to the model in order to accurately represent the changing elevations of the surrounding landscape. The area in the vicinity of the facility cannot be classified as flat terrain, therefore a digitised terrain data was incorporated into the model using a Digital Elevation Model (DEM) file and the AERMAP function of the AERMOD software.

The terrain file included terrain data for the 20 km by 20 km coarse grid and 4 km by 4 km receptor grid centred on the site.

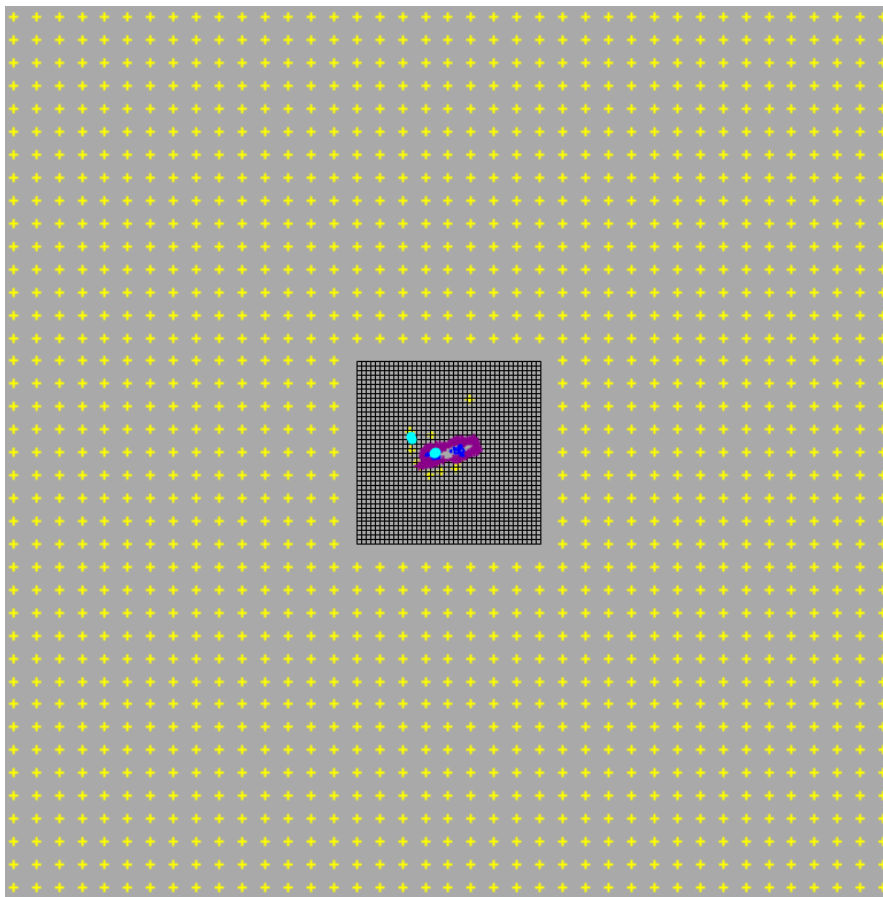


**Figure 11.1:** Built Model including Coarse and Fine Receptor Grid

### Nitrogen Oxides/Nitrogen Dioxide Chemistry

The exhaust from combustion sources contains a mixture of both nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>), which are collectively referred to as nitrogen oxides (NO<sub>x</sub>). A portion of the NO component is converted into NO<sub>2</sub> through reaction with ozone in the atmosphere.

In modelling the NO<sub>2</sub> ground level concentrations, the predicted concentrations of NO<sub>2</sub> from the gas engines and abatement equipment were determined by expressing the gas engines NO<sub>x</sub> mass



emission rate as that of NO<sub>2</sub>. A conservative approach is used to convert NO<sub>x</sub> to NO<sub>2</sub> as outlined in the EPA's AG4 Guidance Note:

- Short term (1-hour average): Assume 50% of emissions of oxides of nitrogen convert to NO<sub>2</sub> in the environment;
- Long term (annual average): Assume all emissions of oxides of nitrogen convert to NO<sub>2</sub> in the environment.

#### 11.2.4 Cumulative Effects

As discussed in *Chapter 2 Description of Proposed Development* of this EIAR, there are a number of permitted developments not yet built as well as projects currently in development in the vicinity of the Proposed Development site that warrant a cumulative impact assessment with the Proposed Development to which this planning application relates.

Cumulative impact assessments with respect to potential air quality effects have been carried out for both the construction (including demolition) and operational phases in this Chapter. A review of publically available information on the relevant developments has been carried out. This information was obtained from various sources such as the Louth County Council and An Bord Pleanála planning databases, for example.

As described in *Chapter 2 Description of Proposed Development* of this EIAR, the Proposed Development to which this planning application relates is the first stage of CORE. Should future phases of development be pursued, they will be subject to their own planning applications at that time which will include cumulative impact assessments with the Proposed Development for which this planning application relates and any other development that has taken place between now and then.

### 11.3 Receiving Environment

#### 11.3.1 Air Quality Zones and Ambient Air Quality

The EPA manages the national ambient air quality network. The *Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive* (2008/50/EC) deals with each EU member state in terms of "Zones". The *Air Quality Standards Regulations* (S.I. No. 280/2011) as amended state that "*The Agency shall establish zones and agglomerations throughout the territory of the State for the purpose of air quality assessment and air quality management*". The zones and agglomerations are defined as follows:

**Zone A:** Dublin Conurbation

**Zone B:** Cork Conurbation

**Zone C:** Other large cities and towns comprising Galway, Limerick, Waterford, Clonmel, Kilkenny, Sligo, Drogheda, Wexford, Athlone, Ennis, Bray, Naas, Carlow, Tralee, Dundalk, Navan, Letterkenny, Celbridge, Newbridge, Mullingar, Balbriggan, Portlaoise, Leixlip and Greystones.

**Zone D:** Rural Ireland, i.e. the remainder of the State excluding Zones A, B and C

From the EPA Air Zone map<sup>129</sup>, the Proposed Development along with the surrounding area is located within Air Quality Zone C. The EPA produces an annual report on air quality<sup>130</sup>, which details the results from monitoring stations throughout the various Air Quality Zones within Ireland. This information of short-term and annual measurements provides values that can be used to derive background concentrations for NO<sub>2</sub>, NO<sub>x</sub> and CO.

<sup>129</sup> EPA Air Zones map. Available at: <https://gis.epa.ie/EPAMaps> [accessed April 2024].

<sup>130</sup> The latest issued EPA report is *Air Quality in Ireland 2022 Key Indicators of Ambient Air Quality* (2022).

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### Nitrogen Dioxide

The nitrogen dioxide monitoring results for the Zone C stations, covering the most recent five year period (2018 to 2022), are presented in Table 11.3. Table 11.4 summarises the resultant estimates of background concentrations that were used for the assessment.

**Table 11.3:** EPA Air Quality Zone C Monitoring Station: NO<sub>2</sub> Annual Mean concentrations (µg/m<sup>3</sup>) for period 2018 – 2022.

| Year           | Meath Navan  | Waterford Browne's Road | Sligo        | Limerick People's Park | Limerick Henry Street | Kilkenny Seville Lodge | Portlaoise  | Dundalk      | Total Average |
|----------------|--------------|-------------------------|--------------|------------------------|-----------------------|------------------------|-------------|--------------|---------------|
| 2018           | --           | -                       | -            | -                      | -                     | 6                      | 11          | 14           |               |
| 2019           | 23           | 8                       | -            | 13                     | -                     | 5                      | 11          | 12           |               |
| 2020           | 19           | 7                       | 17           | 10                     | -                     | 4                      | 11          | 10           |               |
| 2021           | 21.9         | 6.60                    | 16.60        | 9.80                   | 14.80                 | 4.20                   | 7.90        | 10.73        |               |
| 2022           | 21.02        | 7.26                    | -            | 10.20                  | 15.21                 | 4.82                   | 8.98        | 10.44        |               |
| <b>Average</b> | <b>21.23</b> | <b>7.21</b>             | <b>16.80</b> | <b>10.75</b>           | <b>15.00</b>          | <b>4.80</b>            | <b>9.98</b> | <b>11.44</b> | <b>12.15</b>  |

**Table 11.4:** NO<sub>2</sub> Background Concentrations (Long term and Short Term)

| Pollutant Parameter                                                        | EPA Zone C Stations Average Concentration |
|----------------------------------------------------------------------------|-------------------------------------------|
| Nitrogen Dioxide (NO <sub>2</sub> ) - Annual Mean                          | 12.15 µg/m <sup>3</sup>                   |
| Nitrogen Dioxide (NO <sub>2</sub> ) Hourly – 99.8 <sup>th</sup> percentile | 24.3 µg/m <sup>3</sup>                    |

### Oxides of Nitrogen

The estimate of NO<sub>x</sub> background concentrations is based on results from the Dundalk Monitoring Station (Zone C monitoring location which would be expected to be exposed to similar levels of pollutant). The NO<sub>x</sub> monitoring results for the Dundalk Monitoring Station covering the most recent five year period 2018 to 2022 are presented in Table 11.5.

**Table 11.5:** EPA Air Quality Zone C Monitoring Station: Dundalk NO<sub>x</sub> Annual Mean concentrations (µg/m<sup>3</sup>) for period 2018 – 2022.

| Year | Dundalk |
|------|---------|
| 2018 | 21.0    |
| 2019 | 19.4    |
| 2020 | 17.8    |
| 2021 | 17.6    |
| 2022 | 17.9    |

**Table 11.6:** NO<sub>x</sub> Background Concentration (Annual Mean)

| Pollutant Parameter                                                                           | Dundalk Monitoring Station Average Concentration |
|-----------------------------------------------------------------------------------------------|--------------------------------------------------|
| Oxides of Nitrogen (NO <sub>x</sub> ) Annual Mean for projection of vegetation and ecosystems | 18.74 µg/m <sup>3</sup>                          |

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### Carbon Monoxide

The carbon monoxide monitoring results for the Zone C stations, covering the most recent five year period 2018 to 2022 are presented in Table 11.7. Portlaoise and Dundalk stations are the only CO monitoring stations for Zone C.

**11.7:** EPA Air Quality Zone C Monitoring Stations: CO 8 Hour Mean concentrations (mg/m<sup>3</sup>) for period 2018-2022

| Year           | Portlaoise | Dundalk     | Total Average |
|----------------|------------|-------------|---------------|
| 2018           | 0.2        | 0.5         |               |
| 2019           | 0.1        | 0.1         |               |
| 2020           | 0.1        | 0.3         |               |
| 2021           | 0.4        | 0.1         |               |
| 2022           | 0.2        | 0.3         |               |
| <b>Average</b> | <b>0.2</b> | <b>0.26</b> | <b>0.23</b>   |

### 11.3.2 Sensitive Receptors

The nearest sensitive receptors including Natura 2000<sup>131</sup> sites surrounding the Proposed Development site are illustrated in Figure 11.2. The nearest special area of conservation (SAC) to the site is River Boyne and River Blackwater SAC (site code 002299) which is directly adjacent to the south of the site and connects to Boyne Coast and Estuary SAC (Site code 001957). The nearest Special Protection Area (SPA) to the site is Boyne Estuary SPA (004080) which overlaps the Boyne Coast and Estuary SAC and extends to the south.

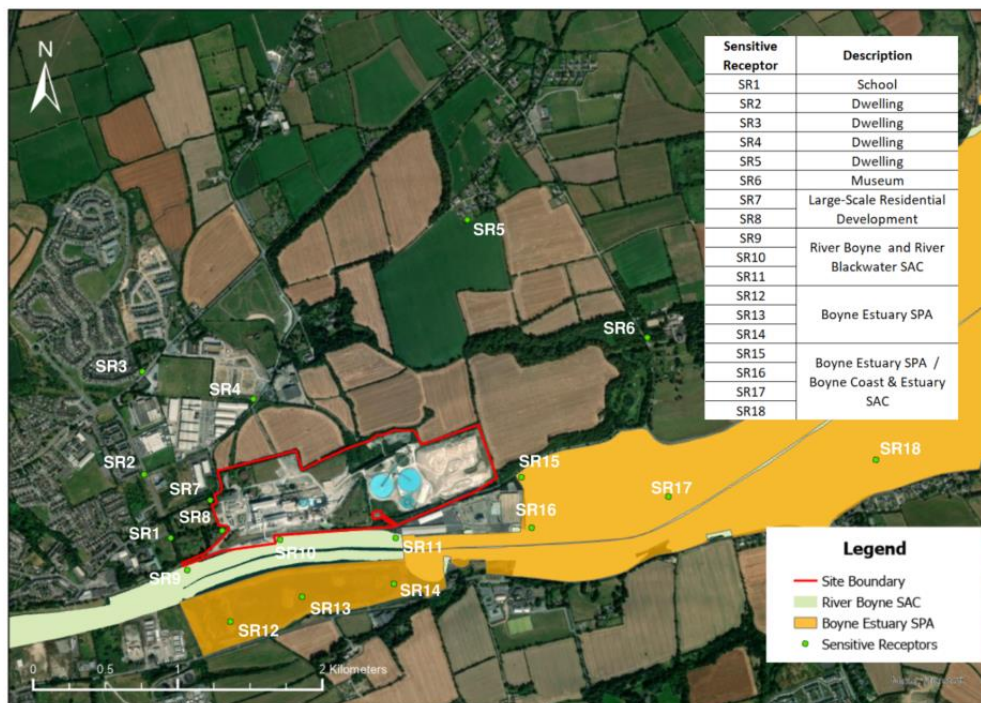


**Figure 11.2:** Nearest Sensitive Receptors to the site

### 11.3.3 Existing Emissions to Atmosphere

Premier Periclase Limited hold an IE Licence for the existing site (Reg. No.: P0376-02). Emission points included within this licence will not remain active in the Proposed Development and therefore have not been included in the air dispersion model.

<sup>131</sup> Natura 2000 is a European network of important ecological sites.

In accordance with the EPA's Guidance Note AG4, a cumulative impact assessment is carried out if it is expected that the effect of two or more significant industrial installations will overlap. A cumulative impact assessment of the development and adjacent sites has been conducted. Sites within 5km of the Proposed Development site which hold an IE/Integrated Pollution Control (IPC) Licence from the EPA, or who have recently applied for a licence were assessed for relevant air emissions.

Figure 11.3 and Table 11.8 illustrate the location of nearby IE/IPC licenced facilities and their main air emissions that have been considered in this cumulative impact assessment



**Figure 11.3:** Nearby IE/IPC licences to the proposed facility

**Table 11.8:** Nearby IE/IPC licenced facilities

| Facility Name                                        | IE/IPC Licence No. | Main Air Emission Points | Included in Cumulative Air Dispersion Modelling Assessment |
|------------------------------------------------------|--------------------|--------------------------|------------------------------------------------------------|
| Drogheda Port Company (Tom Roes Point Port Terminal) | P1011-01           | No Emissions to air      | N/A                                                        |
| Boylan Print Limited                                 | P0784-01           | NO <sub>x</sub><br>CO    | Included                                                   |
| Tirlán Limited                                       | P0799-01           | No Emissions to air      | N/A                                                        |
| Belview Egg Farm Limited                             | P0934-01           | No Emissions to air      | N/A                                                        |
| Advanced Roofing and Cladding Limited                | P0112-01           | Perchlorethylene         | N/A                                                        |

Boylan Print Limited (licence P0784-01) main emission points include a Printing press afterburner and 2 no. Thermal Oxidiser stacks which emit NO<sub>x</sub> and CO. These emission points were included in



the cumulative air dispersion modelling assessment. Table 11.9 shows the Boylan Print Limited emission point data.

**Table 11.9:** Boylan Print Limited emission point data

| Emission Details                                                  | Stack Reference<br>A2-4 | Stack Reference<br>A2-5 | Stack Reference<br>A2-6 |
|-------------------------------------------------------------------|-------------------------|-------------------------|-------------------------|
| Stack Height above grade (m)                                      | 9.2                     | 8                       | 8                       |
| Stack Internal Diameter (m)                                       | 0.5                     | 0.505                   | 0.505                   |
| Exhaust Temperature (K)                                           | 669.23                  | 614.23                  | 635.70                  |
| NO <sub>x</sub> Max. Emission Concentration (mg/Nm <sup>3</sup> ) | 100                     | 100                     | 100                     |
| CO Max. Emission Concentration (mg/Nm <sup>3</sup> )              | 100                     | 100                     | 100                     |
| Maximum Volumetric Flow Rate (Nm <sup>3</sup> /hr)                | 2,672                   | 4,000                   | 5,000                   |
| Exhaust velocity (m/s)                                            | 9.27                    | 12.48                   | 16.15                   |
| NO <sub>x</sub> Mass Emission Rate (g/s)                          | 0.074                   | 0.111                   | 0.139                   |
| CO Mass Emission Rate (g/s)                                       | 0.074                   | 0.111                   | 0.139                   |
| Operational Hours                                                 | Full-time               | Mon-Fri<br>(8am-8pm)    | Mon-Fri<br>(8am-8pm)    |

Additionally, a review of live planning applications in the surrounding area showed no planned emission sources relating to NO<sub>x</sub> & CO.

#### 11.3.4 Meteorological Data

Dublin Airport Meteorological Station is the most appropriate station to provide meteorological data for the air dispersion modelling assessment. The weather station is located approximately 32.8km south of the proposed CORE development. The meteorological data used for the air dispersion modelling covers hourly datasets from the five-year period 2017 to 2021. The windroses for this five-year period are illustrated in Figure 11.4.

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**Figure 11.4:** Meteorological windrose for Dublin Airport Weather Station 2017 to 2021

### 11.3.5 Operational Baseline Scenario

Should the Proposed Development not go ahead, PPL intend to return to peak production of Lime at the facility as permitted under the IE Licence. This is referred to as the 'Operational Baseline Scenario' as described in detail within *Chapter 2 Description of Proposed Development* of this EIAR. A return to the Operational Baseline Scenario would result in emissions to air from the existing, licensed sources and from operational activities at the PPL facility.

Three emission sources are included within the existing PPL IE licence, A1-1, A1-2 and A2-4. Only A2-4 has been in operation since 2014. This is a combined emission point from a lime kiln, multi hearth furnaces and shaft kilns at the existing PPL site. Emissions of NO<sub>2</sub>, NO<sub>x</sub>, Sulphur Dioxide (SO<sub>2</sub>), CO, particulate matter (PM<sub>10</sub>, PM<sub>2.5</sub>) and hydrogen chloride (HCl) are emitted through emission point A2-4 from these sources.

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An air dispersion modelling assessment was completed in 2014 to assess the impacts of the operational emissions from A2-4 and this is included as Attachment 11.1 of this EIAR.

### 11.3.6 Discussion of Operational Baseline Scenario

The results of the air dispersion modelling assessment carried out in 2014 show predicted maximum ground level concentrations (GLCs) of NO<sub>2</sub>, NO<sub>x</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, CO and HCL from the operation of the lime kiln, multi hearth furnaces and shaft kilns at the existing PPL site are in compliance with the ASQ for both the protection of human health and protection of vegetation.

## 11.4 Characteristics of the Proposed Development

The Proposed Development to which this planning application relates is the first phase of CORE, and will consist of extensive works that will transform the ca. 35.6 hectare site and set it on a path that will result in it becoming a sustainably powered enterprise campus. It is noted that the Proposed Development is unrelated to the existing Industrial Emissions licensed activity at the site. The Proposed Development consists of:

- The demolition of existing buildings, structures, and services associated with the PPL facility, as well as site clearance and remediation works.
- The careful sequestering of the licensed (inert) landfill onsite in accordance with all ongoing and future requirements of the EPA.
- A number of existing buildings and structures will be maintained as part of the Proposed Development, such as a Workshop Building, part of a Crane Store structure, 3 no. Lime Silos and water tanks and infrastructure, all of which have been incorporated into the design where beneficial and appropriate.
- The construction of a three storey Energy Centre (EC) building, a three storey Data Centre (DC) building, a single storey Facility Operations Centre (FOC) building, a single storey Pump and Filtration Building, a single storey Security Gatehouse and a Security Kiosk at the main site entrance of the site.
- The provision of a Battery Energy Storage System (BESS) Compound, an ESB Substation, a Cooling Compound, a Thermal Store Compound, a Pump and Filtration System, other ancillary structures including a Firewater Tank, a Fire Fighting Water Pump Building, a Control Building, a Maintenance Yard and Waste Management facilities. Ground-mounted solar Photo Voltaic (PV) arrays will also be provided on the existing licensed landfill and stockpile no. 3, along with 3 no. compact substations.
- The provision of all associated works including access arrangements, internal roadways and footpaths, car and cycle parking, boundary treatments, landscaping and services, and all ancillary works.

A detailed description of the Proposed Development is included in *Chapter 2 Description of Proposed Development* of this EIAR, which includes details of the demolition works required, details of the construction of the new buildings and structures, and details of the various elements that will make up the Proposed Development when it will be operational.

The following subsections provide details of the various phases of the Proposed Development which have the potential to give rise to effects on Air Quality.

### 11.4.1 Construction Phase (including Demolition)

A detailed description of the construction phase (including demolition works) associated with the Proposed Development is included within *Chapter 2 Description of Proposed Development* of this EIAR.

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## Demolition Works

The proposed works include the demolition of specified above ground structures. The duration of the demolition phase of the Proposed Development will be approximately 14 months. Emissions to air during this phase will arise from construction machinery and from:

- Demolition & removal of structures;
- Concrete slabs and foundations breakout across site;
- Crushing of demolition rubble;
- Infill of voids;
- Levelling of site;
- Construction Traffic.

## Construction Works

The duration of the construction phase of the Proposed Development will be approximately 24 months. Emissions to air during this phase will arise from construction machinery and from:

- Excavation and earthmoving activities;
- Temporary stockpiling of excavated materials;
- Construction Traffic.

The details of the construction traffic associated with the Proposed Development are outlined in Section 6.8 of *Chapter 6 Traffic and Transportation* of this EIAR.

### 11.4.2 Operational Phase

Emissions to air from the Proposed Development will consist of gas engines:

#### Gas Engines

As part of the Proposed Development, it is planned to install nine 4.5 MW gas engines located in the EC, which provide power to the campus. Each engine has a dedicated vertical flue with an exhaust height of 28.9 m above ground level. Engine operation will be controlled to match the facilities requirement, from 4.5-40.5 MW electrical output.

The best available technology (Selective Catalytic Reduction (SCR) system) will be installed on the engine exhausts in order to reduce NO<sub>x</sub> and CO emission concentrations.

Air dispersion modelling was performed to predict the maximum ground level concentrations from the nine gas engines which will constitute main emission points to air during the operation of the Proposed Development. In order to investigate the effect of differing operational load requirements, a number of operational scenarios were tested which include a number of engines running at reduced loads as follows:

- Scenario 1: Nine no. engines running at 100% load;
- Scenario 2: Four no. engines running at 100% load, three no. engines running at 75% load, one no. engine running at 50% load;
- Scenario 3: Two no. engines running at 50% load.

Operational scenario tests carried out show that Scenario 1 (nine no. engines running at 100% load) results in higher predicted environmental concentrations in the model compared to Scenario 2 and Scenario 3 therefore Scenario 1 has been used for this air dispersion modelling assessment.

#### Stack Discharge Parameters and Emission Data

This section outlines the inputs to the model in relation to the facility emission points. Figure 11.5 shows the site layout including buildings and stacks in the model. Site layout, building and emission details were provided by AtkinsRéalis & Clarke Energy. The model inputs are tabulated in Table 11.10.



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Emission data was supplied by Clarke Energy (gas engine suppliers) and emissions are within the limits in the *European Union (Medium Combustion Plants) Regulations (2017)* for NO<sub>x</sub>.

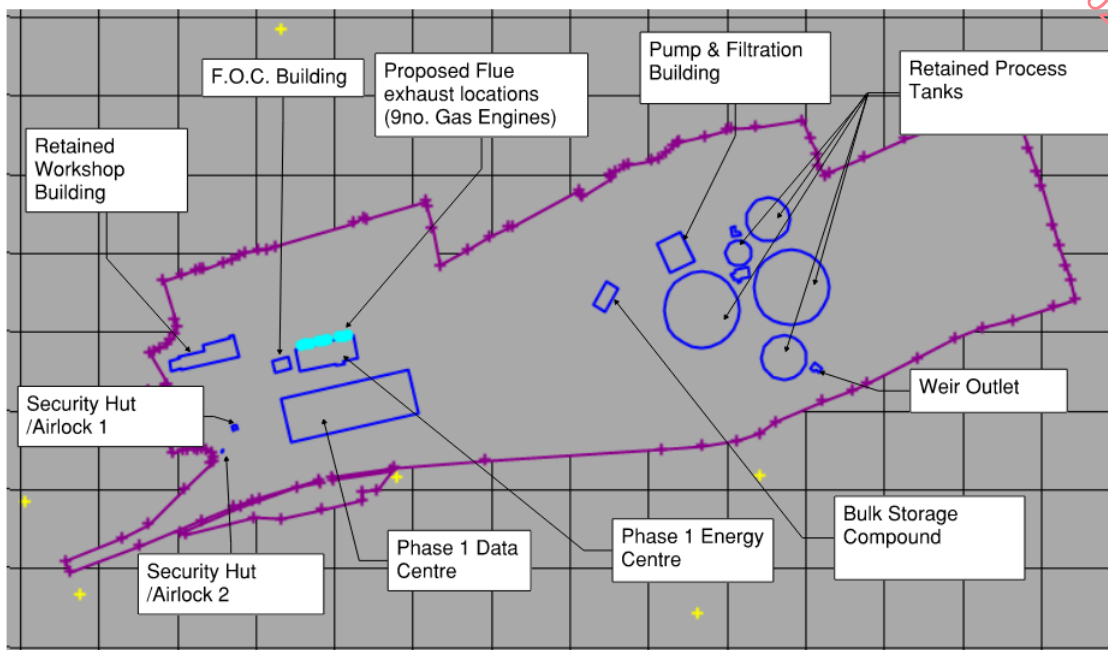


**Figure 11.5:** Site Layout in Model

**Table 11.10:** Stack Parameter and Emission Data

| Emission Details                                                                 | Gas Engine<br>@100% Load |
|----------------------------------------------------------------------------------|--------------------------|
| Stack Height above grade (m)                                                     | 28.9                     |
| Stack Internal Diameter (m)                                                      | 0.6                      |
| Exhaust Temperature (K)                                                          | 624.15                   |
| NO <sub>x</sub> Max. Emission Concentration (mg/Nm <sup>3</sup> ) <sup>1,3</sup> | 63                       |
| CO Max. Emission Concentration (mg/Nm <sup>3</sup> ) <sup>2,3</sup>              | 1,050                    |
| Actual Volumetric Flow Rate at discharge conditions (m <sup>3</sup> /hr)         | 40,680                   |
| Exhaust velocity (m/s)                                                           | 39.97                    |
| Normalised Volumetric Flow Rate (Nm <sup>3</sup> /hr) <sup>3</sup>               | 35,908                   |
| NO <sub>x</sub> Mass Emission Rate (g/s)                                         | 0.6284                   |
| CO Mass Emission Rate (g/s)                                                      | 10.473                   |
| Operational Hours                                                                | Full-time                |

<sup>1</sup> After Selective Catalytic Reduction (SCR) system.

<sup>2</sup> Not including reduction after Selective Catalytic Reduction (SCR) system. It is not yet known the affect the SCR system will have on reducing CO emissions; therefore, CO emissions have been modelled at the maximum emission concentration as provided by the vendor, not taking account of a reduction that will be achieved by the SCR abatement system.

<sup>3</sup> At normalised conditions (273.15 K, 101.3 kPa, 15% O<sub>2</sub>).

### Operational Traffic

Refer to the Section 6.9 of *Chapter 6 Traffic and Transportation* of this EIAR for a description of the operational traffic increases as a result of the Proposed Development.

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## Odour

The likelihood of odours was assessed and discounted on the basis of the activities planned on this site, within the context of the planning application. There is no proposal for any systems on site, which would have odour emissions. Therefore, effects of odour on ambient air quality are not considered further within this Chapter.

## 11.5 Potential Effects

### 11.5.1 Construction Phase (including Demolition)

The various construction activities discussed in Section 11.4.1 of this Chapter could result in the temporary generation of dust, which could negatively affect ambient air quality in the absence of mitigation measures.

It is probable that the majority of dust generated will be deposited within or close to the site boundary. A number of factors will affect the extent of dust generation and potential effects on air quality including wind speed and direction, the dryness of the soil, and the proximity of sensitive receptors to the site. There is also the probability of the transfer of mud/soil from the wheels of construction traffic onto surrounding roads (track out).

Using the assessment procedure outlined in the *Institute of Air Quality Guidance (IAQM) (2024) on the Assessment of Dust from Demolition and Construction*, the dust emission magnitude (relating to demolition, earthworks, construction and track out) and sensitivities of the area (relating to dust soiling, health (PM<sub>10</sub>) and ecological effects) to dust were determined. In line with the IAQM (2024) guidance, the site was allocated to a risk category based on two factors:

- The scale and nature of the works, which determines the potential dust emission magnitude as small, medium or large;
- The sensitivity of the area to dust impacts, which is defined as low, medium or high sensitivity.

Dust soiling and health (PM<sub>10</sub>) sensitivities were determined as low due to sensitive receptors distances from the site and the low annual mean PM<sub>10</sub> concentration in Drogheda (11.9 ug/m<sup>3</sup> in 2022<sup>132</sup>). Due to the proximity of the River Boyne and River Blackwater SAC to the site, the sensitivity of the area relating to ecological effects was determined to be high.<sup>133</sup>

### Demolition Works

Due to the proposed demolition scope, the dust emission magnitude for demolition was determined as large<sup>134</sup>.

The dust emission magnitude was combined with the sensitivity of the area to determine the risk of effects with no mitigation applied. The level of risk associated with demolition works on dust soiling and human health can be regarded as medium. Due to the close proximity of the site to the River Boyne and River Blackwater SAC, the Boyne Coast and Estuary SAC and the Boyne Estuary SPA, there is a high risk associated with the demolition works.

**Table 11.11: Dust Risk Associated with Demolition Work**

| Potential Effect | Demolition  |
|------------------|-------------|
| Dust Soiling     | Medium Risk |
| Human Health     | Medium Risk |
| Ecological       | High Risk   |

<sup>132</sup> The latest issued EPA report is *Air Quality in Ireland 2022 Key Indicators of Ambient Air Quality (2022)*

<sup>133</sup> Based on IAQM (2024) Guidance, Table 2 (Sensitivity of the Area to Dust Soiling Effects on People and Property), Table 3 (Sensitivity of the Area to Human Health Impacts) and Table 4 (Sensitivity of the Area to Ecological Impacts).

<sup>134</sup> A 'Large' demolition emission magnitude is defined as 'Total building volume >75,000 m<sup>3</sup>, potentially dusty construction material, on-site crushing and screening, demolition activities >12 m above ground level' in the IAQM (2024) Guidance.

Therefore, in the absence of adequate management and mitigation measures, the demolition phase of the Proposed Development could have a negative, moderate and short-term effect on ambient air quality as a result of dust generation in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance.

### Construction Phase Works

Based on the heavy goods vehicle (HGV) daily movements noted in Section 6.7 of *Chapter 6 Traffic and Transportation* of this EIAR, the dust emission magnitude for track out was determined as large<sup>135</sup>.

The dust emission magnitude was combined with the sensitivity of the area to determine the risk of effects with no mitigation applied.

Dust soiling and human health (PM<sub>10</sub>) risk due to earthworks, construction and track out can be regarded as low. There is a high risk associated with earthworks, construction and track out in regard to ecological effects.<sup>136</sup>

**Table 11.12:** Dust Risk Associated with Construction Activities

| Potential Effect | Earthworks | Construction | Track out |
|------------------|------------|--------------|-----------|
| Dust Soiling     | Low Risk   | Low Risk     | Low Risk  |
| Human Health     | Low Risk   | Low Risk     | Low Risk  |
| Ecological       | High Risk  | High Risk    | High Risk |

The operation of construction equipment, mobile plant and the movement of vehicular traffic associated with site construction staff will result in exhaust emissions that could also potentially affect ambient air quality. These emissions, typical of all motorised vehicles and equipment, will include NO<sub>2</sub>, CO, PM<sub>10</sub>, along with limited quantities of SO<sub>2</sub> from the use of diesel fuel.

Therefore, in the absence of adequate management and mitigation measures, the Construction Phase of the Proposed Development could have a negative, moderate and short-term effect on ambient air quality as a result of dust generation and vehicle emissions in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance.

### Construction Phase Traffic

Trip generation for the construction stage of the Proposed Development is detailed in the Section 6.7 of *Chapter 6 Traffic and Transportation* of this EIAR.

It is estimated that the construction phase will typically generate a total of 108 daily inbound vehicles (excluding HGVs, HGVs have been assumed to occur during off-peak periods) and 110 daily outbound vehicles (excluding HGVs). HGV traffic during the Construction Phase was estimated as a maximum of 20 two-way trips per hour.

Guidance from Transport Infrastructure Ireland (TII)<sup>137</sup> and the *Highways England Design Manual for Roads and Bridges* (DMRB)<sup>138</sup> set out the following traffic scoping criteria, which can be used to determine whether the air quality effects of a project can be scoped out or require further assessment:

- a) Road alignment will change by 5 m or more; or

<sup>135</sup> A 'Large' track out emission magnitude is defined as >50 Heavy Goods Vehicle outward movements in any one day, potentially dusty surface material, unpaved road length >100m;

<sup>136</sup> Based on IAQM (2024) Guidance, Table 6 (Risk of Dust Impacts - Demolition), Table 7 (Risk of Dust Impacts - Earthworks), Table 8 (Risk of Dust Impacts - Construction) and Table 9 (Risk of Dust Impacts - Track out)

<sup>137</sup> Transport Infrastructure Ireland (TII), (2022), *Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document, PE-ENV-01106*

<sup>138</sup> *Highways England Design Manual for Roads and Bridges* (DMRB) (2019), LA 105 Air Quality, Rev 0

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- b) Daily traffic flows will change by 1,000 AADT (annual average daily traffic) or more; or
- c) Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or
- d) Daily average speed will change by 10 km/hr or more; or
- e) Peak hour speed will change by 20 km/hr or more.

Criteria (a) is not applicable to the Proposed Development.

Total construction trips including HGVs associated with the peak construction stage of the Proposed Development will be significantly below the AADT increases specified in criteria (b) and (c), which also implies that a reduction in daily average speed as outlined in criteria (d) is unlikely.

As noted in Section 6.7, *Chapter 6 Traffic and Transportation* of this EIAR, the estimated number of trips during peak traffic hours in construction is fewer than the operational phase trips. Therefore, the relevant junctions were analysed for the operational phase only as a worst case (refer to Section 11.5.2). A separate analysis of the M1 motorway was conducted for the construction phase which determined that the M1-Junction 8 and Junction 10 sections have sufficient capacity to accommodate staff trips.

Based on the above, it is considered that peak hour speed will not change by 20 km/hr or more as a result of the construction traffic associated with the Proposed Development (criteria (e) not met).

Hence, in summary none of the above qualifying criteria has been met, therefore effects on air quality due to the construction traffic associated with the Proposed Development can be scoped out in accordance with the DMRB (2019) Guidance and do not require further assessment. The effects on air quality due to the construction traffic associated with the Proposed Development can be considered to be neutral, not significant and is short-term in terms of local air quality in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance.

## 11.5.2 Operational Phase

### Air Dispersion Modelling

Tables 11.13 to 11.16 outline the results of the modelling exercise and express them as a percentage of the relevant ambient air quality standard.

Predicted Environmental Concentrations (PECs) (i.e. background concentrations (BC) plus modelled process contributions (PCs)) were also calculated for each parameter and averaging time, for comparison to AQS limit values. This assessment ensures that both the modelled emissions and the existing background concentrations are taken into account when determining the possible overall ambient air quality once the development is operational. Refer to Section 11.3.1 of this report for the basis used for existing background concentration levels.

Contour plots for the situation following the proposed changes have also been produced using the AERMOD 3D Analyst software tool and Google Earth Pro and are included in Appendix B of this EIAR.

#### Nitrogen Dioxide

As discussed earlier, an SCR system will be installed on the gas engine exhausts in order to reduce emission concentrations. Air dispersion modelling was carried out using a target emission concentration after SCR value of 63 mg/Nm<sup>3</sup> for the new engines.

The maximum 99.8%ile 1-hour result for NO<sub>2</sub> was 110.14 µg/m<sup>3</sup>. This result occurred in the model run using the 2021 meteorological data in Scenario 1 (9 engines operating at 100% load).

The maximum 99.8%ile 1-hour result (110.14 µg/m<sup>3</sup>) was combined with the appropriate background (BG) concentrations for NO<sub>2</sub> (24.3 µg/m<sup>3</sup>) in accordance with the EPA's AG4 Guidance Note to give an overall maximum 99.8%ile 1 hour ground level concentration of 134.44 µg/m<sup>3</sup>. This represents 67% of the air quality standard of 200 µg/m<sup>3</sup>, and therefore within the acceptable limits.

The maximum annual mean result for NO<sub>2</sub> was 17.93 µg/m<sup>3</sup> and occurred in the model run using the 2017 meteorological data in Scenario 1 (9 No. engines operating at 100% load). This was combined with the appropriate background concentration (12.15 µg/m<sup>3</sup>) to give an overall maximum annual ground level concentration of 30.08 µg/m<sup>3</sup>. With respect to the protection of human health, the annual average NO<sub>2</sub> limit is 40 µg/m<sup>3</sup>. The predicted environmental concentration of 30.08 µg/m<sup>3</sup> represents 75% of the air quality standard for the protection of human health.

**Table 11.13:** NO<sub>2</sub> Air Dispersion Modelling Results of the Proposed Development

| Pollutant        | Averaging Period       | Air Quality Standards/ Guideline Values (µg/m <sup>3</sup> ) | Predicted Max Occurred in Year | Predicted Max. Process Contribution (PC) (µg/m <sup>3</sup> ) | Background Conc. (µg/m <sup>3</sup> ) | PEC: Background + Process Contribution (µg/m <sup>3</sup> ) | Predicted Result as Percentage of AQS |
|------------------|------------------------|--------------------------------------------------------------|--------------------------------|---------------------------------------------------------------|---------------------------------------|-------------------------------------------------------------|---------------------------------------|
| Nitrogen Dioxide | 1 hr NO <sub>2</sub>   | 200                                                          | 2021                           | 110.14                                                        | 24.3                                  | 134.44                                                      | 67%                                   |
|                  | Annual NO <sub>2</sub> | 40 (Human Health Protection)                                 | 2017                           | 17.93                                                         | 12.15                                 | 30.08                                                       | 75%                                   |

The predicted environmental concentration for the maximum 99.8%ile 1-hour result and maximum annual mean result for NO<sub>2</sub> falls below the AQS and therefore the effect of NO<sub>x</sub> emissions from the Proposed Development can be deemed as negative and long-term but not significant in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance.

It is noted that a suitably conservative approach has been taken in the modelling, as it does not take into account the integration of onsite renewable generation, energy storage or utilisation of grid electricity, which enables the reduction/elimination of emissions from the development. The actual gas engine operation will be constrained to operate only when it is beneficial when compared to the national grid or in reserve.

#### Sensitive Receptors (Human Health)

Refer to Section 11.3.2 of this chapter for a description of the sensitive receptors surrounding the Proposed Development which have been included as discrete receptors in the air dispersion model. The maximum predicted environmental concentrations at all receptors in the model (including sensitive receptors) are included in the above modelling results (Table 11.13) and therefore fall below the AQS 99.8%ile 1-hour and annual mean limits for NO<sub>2</sub> for the protection of human health.

The maximum predicted environmental concentrations for annual mean NO<sub>2</sub> at the sensitive receptors relating to human health are documented in Table 11.14.

The maximum annual mean result for NO<sub>2</sub> at sensitive receptors relating to human health was 5.28 µg/m<sup>3</sup> at SR7 (Large-Scale Residential Development) and occurred in the model run using the 2018 meteorological data. This was combined with the appropriate background concentration (12.15 µg/m<sup>3</sup>) to give an overall maximum annual ground level concentration of 17.43 µg/m<sup>3</sup>.

With respect to the protection of human health, the annual average NO<sub>2</sub> AQS limit is 40 µg/m<sup>3</sup>. The predicted environmental concentration of 17.43 µg/m<sup>3</sup> represents 44% of the AQS for the protection of human health.



**Table 11.14: Air Dispersion Modelling Results – Maximum Annual NO<sub>2</sub> Concentration for surrounding Sensitive Receptors (Human Health)**

| Sensitive Receptors |                                           | UTM Coordinates<br>(Zone 29N) |          | Year of Max<br>Predicted<br>Results | Max Annual<br>NO <sub>2</sub> PC<br>conc.<br>(µg/m <sup>3</sup> ) | Bkgrd.<br>Concentrati<br>on (µg/m <sup>3</sup> ) | Max Annual<br>NO <sub>2</sub> PEC conc.<br>(µg/m <sup>3</sup> ) | Predicted Result as<br>Percentage of AQS |
|---------------------|-------------------------------------------|-------------------------------|----------|-------------------------------------|-------------------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------------|------------------------------------------|
| No                  | Description                               | Easting                       | Northing |                                     |                                                                   |                                                  |                                                                 |                                          |
| SR1                 | School                                    | 676482                        | 5955764  | 2020                                | 3.07                                                              | 12.15                                            | 15.22                                                           | 38%                                      |
| SR2                 | Dwelling                                  | 676360                        | 5956035  | 2021                                | 2.74                                                              |                                                  | 14.89                                                           | 37%                                      |
| SR3                 | Dwelling                                  | 676330                        | 5956435  | 2019                                | 2.43                                                              |                                                  | 14.58                                                           | 36%                                      |
| SR4                 | Dwelling                                  | 676808                        | 5956363  | 2021                                | 2.34                                                              |                                                  | 14.49                                                           | 36%                                      |
| SR5                 | Dwelling                                  | 677633                        | 5957132  | 2017                                | 1.23                                                              |                                                  | 13.38                                                           | 33%                                      |
| SR6                 | Museum                                    | 678498                        | 5956728  | 2017                                | 1.08                                                              |                                                  | 13.23                                                           | 33%                                      |
| SR7                 | Large-Scale<br>Residential<br>Development | 676632                        | 5955920  | 2018                                | 5.28                                                              |                                                  | 17.43                                                           | 44%                                      |
| SR8                 |                                           | 676701                        | 5955819  | 2020                                | 4.65                                                              |                                                  | 16.80                                                           | 42%                                      |

As the maximum predicted environmental concentrations at human health sensitive receptors are well below the relevant AQS, the effect of NO<sub>x</sub> emissions from the Proposed Development can be deemed as negative and long-term but not significant in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance.

#### Sensitive Receptors (Ecological Sites)

Refer to Section 11.3.2 of this chapter for a description of the sensitive receptors surrounding the Proposed Development which have been included as discrete receptors in the air dispersion model.

The critical level for annual NO<sub>x</sub> for the protection of vegetation is specified as 30 µg/m<sup>3</sup> in Annex XIII of Directive 2008/50/EC on ambient air quality and cleaner air for Europe Directive implemented in Ireland by the Air Quality Standards Regulations 2022 (S.I. No. 739 of 2022). This critical level for NO<sub>x</sub> is not habitat specific, but has been set to cover broad vegetation types and is the level below which significant harmful effects are not thought to occur.

The results of the air dispersion model show that the highest ground level concentration of NO<sub>x</sub> occurred at SR10 (River Boyne and River Blackwater SAC) with a predicted PC NO<sub>x</sub> value of 9.00 µg/m<sup>3</sup>. Using a background NO<sub>x</sub> concentration of 18.74 µg/m<sup>3</sup> (refer to Section 11.3.1 of this report) the maximum annual average PEC River Boyne and River Blackwater SAC is equivalent to 92% of the AQS.

**Table 11.15: Air Dispersion Modelling Results – Maximum Annual NO<sub>x</sub> Concentration for surrounding Sensitive Receptors (Ecological Sites)**

| Sensitive Receptors |                                               | UTM Coordinates (Zone 29N) |          | Year of Max Predicted Results | Max Annual NO <sub>x</sub> PC conc. (µg/m <sup>3</sup> ) | Bkgrd. Concentration (µg/m <sup>3</sup> ) | Max Annual NO <sub>x</sub> PEC conc. (µg/m <sup>3</sup> ) | Predicted Result as Percentage of AQS |
|---------------------|-----------------------------------------------|----------------------------|----------|-------------------------------|----------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------|---------------------------------------|
| No                  | Description                                   | Easting                    | Northing |                               |                                                          |                                           |                                                           |                                       |
| SR9                 | River Boyne and River Blackwater SAC          | 676552                     | 5955646  | 2020                          | 2.22                                                     | 18.74                                     | 20.96                                                     | 70%                                   |
| SR10                |                                               | 676956                     | 5955794  | 2021                          | 9.00                                                     |                                           | 27.74                                                     | 92%                                   |
| SR11                |                                               | 677418                     | 5955797  | 2017                          | 4.19                                                     |                                           | 22.93                                                     | 76%                                   |
| SR12                | Boyne Estuary SPA (South)                     | 676759                     | 5955479  | 2020                          | 1.71                                                     |                                           | 20.45                                                     | 68%                                   |
| SR13                |                                               | 677007                     | 5955560  | 2018                          | 2.38                                                     |                                           | 21.12                                                     | 70%                                   |
| SR14                |                                               | 677352                     | 5955621  | 2021                          | 3.32                                                     |                                           | 22.06                                                     | 74%                                   |
| SR15                | Boyne Estuary SPA / Boyne Coast & Estuary SAC | 677913                     | 5956072  | 2017                          | 2.34                                                     |                                           | 21.08                                                     | 70%                                   |
| SR16                |                                               | 677913                     | 5956072  | 2017                          | 2.12                                                     |                                           | 20.86                                                     | 70%                                   |
| SR17                |                                               | 677913                     | 5956072  | 2017                          | 1.10                                                     |                                           | 19.84                                                     | 66%                                   |
| SR18                |                                               | 677913                     | 5956072  | 2017                          | 0.63                                                     |                                           | 19.37                                                     | 65%                                   |

All sensitive receptors representing the nearest Natura 2000 sites to the Proposed Development (River Boyne and River Blackwater SAC, Boyne Coast & Estuary SAC and Boyne Estuary SPA) show predicted PC and PEC NO<sub>x</sub> values below the AQS annual mean limit of 30 µg/m<sup>3</sup> for protection of vegetation and ecosystems.

The contour plots included in Appendix B of this EIAR illustrate that highest predicted ground level concentrations of NO<sub>x</sub> occur close to the boundary of the Proposed Development with concentrations decreasing with distance from the facility. Therefore, the results at the nearest Natura 2000 sites are considered worst case. Potential ground level concentrations at other Natura 2000 sites further away from the Proposed Development will be below these results and below the AQS annual mean limit of 30 µg/m<sup>3</sup> for protection of vegetation and ecosystems.

It is noted that a suitably conservative approach has been taken in the modelling. Gas engines emissions were modelled under continuous operation for the full year (24/7) and does not take into account the integration of onsite renewable generation, energy storage or utilisation of grid electricity, which enables the reduction/elimination of emissions from the development.

Based on the results presented above, the operational effect of air emissions on ecosystems from the Proposed Development can be deemed as negative and long-term but not significant.

#### Carbon Monoxide

Air dispersion modelling was carried out using emission concentrations without the addition of the SCR system as a worst-case scenario. Carbon monoxide concentrations from the engines prior to SCR are 1,050 mg/Nm<sup>3</sup>.

The 8-hour mean result for CO was 3165.83 µg/m<sup>3</sup>. This result occurred in the model run using the 2019 meteorological data in Scenario 1 (9 No. engines running at 100% load).

The 8-hour mean result (3,165.83 µg/m<sup>3</sup>) was combined with the appropriate background concentrations for CO (230 µg/m<sup>3</sup>) in accordance with the EPA's AG4 Guidance Note to give an overall maximum 8-hour ground level concentration of 3,395.83 µg/m<sup>3</sup>. This represents 34% of the air quality standard of 10,000 µg/m<sup>3</sup>, and therefore is well within acceptable limits.

**Table 11.16:** CO Air Dispersion Modelling Results of the Proposed Development

| Pollutant       | Averaging Period | Air Quality Standards/ Guideline Values (µg/m <sup>3</sup> ) | Predicted Max Occurred in Year | Predicted Max. Process Contribution (PC)* (µg/m <sup>3</sup> ) | Background Conc. (µg/m <sup>3</sup> ) | PEC: Background + Process Contribution (µg/m <sup>3</sup> ) | Predicted Result as Percentage of AQS |
|-----------------|------------------|--------------------------------------------------------------|--------------------------------|----------------------------------------------------------------|---------------------------------------|-------------------------------------------------------------|---------------------------------------|
| Carbon Monoxide | 8 hr CO          | 10,000                                                       | 2019                           | 3,165.83                                                       | 230                                   | 3,395.83                                                    | 34%                                   |

The predicted environmental concentration for the maximum 8 hour CO mean falls below the AQS and therefore the effect of CO emissions from the Proposed Development can be deemed as negative and long-term but not significant in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance.

It is noted that in addition to the conservative approach that has been taken in the modelling regarding the gas engine operation, carbon monoxide emission rates modelled do not take into account the significant reduction which will be seen due to the Selective Catalytic Reduction (SCR system) which will be installed on the engine exhausts to reduce emission concentrations.

#### **Operational Phase Traffic**

Trip generation data for the operational stage of the Proposed Development is detailed in the Section 6.7 of Chapter 6 Traffic and Transportation of this EIAR. It is estimated that the operational phase will typically generate a total of 63 daily inbound vehicles and 63 daily outbound vehicles including two heavy vehicle trips. With regard to operational traffic, peak hours' junction capacity analysis was performed in Chapter 6 Traffic and Transportation of this EIAR. The results were as follows:

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#### Junction 2: R167 Strand Road / R899 Greenhills Road Junction

Highest average morning and evening peak hour delays per vehicle at the existing R167 Strand Road / R899 Greenhills Road Junction will be up to 2 minutes 44 seconds, respectively, with peak operation, compared to 2 minutes and 5 seconds without the Proposed Development.

#### Junction 11: (R167 Strand Road/L6327 Local Road Junction

The Proposed Development was shown to cause minimal delays along all arms (in the range of 5-10 seconds). Guidance from Transport Infrastructure Ireland (TII)<sup>139</sup> and the Highways England Design Manual for Roads and Bridges (DMRB)<sup>140</sup> set out the following scoping criteria which can be used to determine whether the air quality effects of a project can be scoped out or require further assessment:

- a) *Road alignment will change by 5 m or more; or*
- b) *Daily traffic flows will change by 1,000 AADT (annual average daily traffic) or more; or*
- c) *Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or*
- d) *Daily average speed will change by 10 km/hr or more; or*
- e) *Peak hour speed will change by 20 km/hr or more.*

Criteria (a) is not applicable to the Proposed Development.

Total operational trips including HGVs associated during the operational stage of the Proposed Development is significantly below the AADT increases specified in criteria (b) and (c), which also implies that a reduction in daily average speed as outlined in criteria (d) is unlikely.

Based on the above, it is considered that peak hour speed will not change by 20 km/hr or more as a result of the operational traffic associated with the Proposed Development (criteria (e) not met).

Hence, none of the above qualifying criteria has been met and the effect on air quality from the operational traffic associated with the Proposed Development can be scoped out in accordance with the DMRB (2019) Guidance and do not require further assessment. The operating traffic associated with the Proposed Development can be considered to be neutral and long-term but not significant in terms of local air quality in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance.

## **11.6 Potential Cumulative Effects**

### **11.6.1 Construction Phase (including Demolition)**

As regards potential cumulative effects with other permitted developments in the area (refer to Section 2.10 of this EIAR), it is anticipated that there will be an increase in emissions to air during this phase due to the construction activities noted in Section 11.4.1.

However, assuming all mitigation measures proposed in Section 11.7.1 as well as all mitigation measures proposed as part of the planning applications for the permitted developments considered as part of the cumulative impacts assessment are implemented in full, any potential cumulative effects air emissions are anticipated to be minimal. Any potential cumulative effects will be negative, not significant, temporary in nature and will only exist for the period that the construction phases overlap with each other.

Potential future phases of CORE will be subject to separate planning applications and EIAR. Future phases of the development may require additional mitigation measures to ensure the proper management of air quality during their construction phases. These measures will be identified and detailed as part of the EIAR for any additional respective phases of the development to ensure the

<sup>139</sup> Transport Infrastructure Ireland (TII), (2022), Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document, PE-ENV-01106

<sup>140</sup> Highways England Design Manual for Roads and Bridges (DMRB) (2019), LA 105 Air Quality, Rev 0



potential future phases do not have any significant adverse effects with respect to air quality during their construction phases.

## 11.6.2 Operational Phase

### Air dispersion Modelling

A cumulative impact assessment was completed which included the emissions from neighbouring combustion plant. Details of the air emissions data used for the cumulative air dispersion model are included Section 11.3.3.

The cumulative air dispersion modelling results for nitrogen dioxide and carbon monoxide indicate that the predicted maximum GLCs for the hourly average and annual average are below the relevant AQSs for the worst-case modelled scenarios.

The cumulative assessment involved modelling all of the main air emissions at the Proposed Development in addition to the emissions from the relevant adjacent sites (Boylan Print Limited - P0784-01).

#### Nitrogen Dioxide Results

The maximum cumulative 99.8%ile 1 hour result for NO<sub>2</sub> was 134.48 µg/m<sup>3</sup> when combined with the background concentration (24.3 µg/m<sup>3</sup>) and occurred in the model run using the 2021 meteorological data. This cumulative result represents 67% of the air quality standard of 200 µg/m<sup>3</sup> at the worst-case offsite receptor, and therefore is within acceptable limits.

The cumulative maximum annual result for NO<sub>2</sub> was 30.31 µg/m<sup>3</sup> when combined with the background concentration (12.15 µg/m<sup>3</sup>) and occurred in the model run using the 2017 meteorological data. With respect to the protection of human health, the annual average NO<sub>2</sub> limit is 40 µg/m<sup>3</sup>. The predicted environmental concentration of 30.31 µg/m<sup>3</sup> represents 76% of the air quality standard for the protection of human health.

**Table 11.17:** Cumulative NO<sub>2</sub> Air Dispersion Modelling Results of the Proposed Development

| Pollutant        | Averaging Period       | Air Quality Standards/ Guideline Values (µg/m <sup>3</sup> ) | Predicted Max Occurred in Year | Predicted Max. Process Contribution (PC)* (µg/m <sup>3</sup> ) | Background Conc. (µg/m <sup>3</sup> ) | PEC: Background + Process Contribution (µg/m <sup>3</sup> )** | Predicted Result as Percentage of AQS |
|------------------|------------------------|--------------------------------------------------------------|--------------------------------|----------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------|---------------------------------------|
| Nitrogen Dioxide | 1 hr NO <sub>2</sub>   | 200                                                          | 2021                           | 110.15                                                         | 24.3                                  | 134.48                                                        | 67%                                   |
|                  | Annual NO <sub>2</sub> | 40 (Human Health Protection)                                 | 2017                           | 18.16                                                          | 12.15                                 | 30.31                                                         | 76%                                   |

The predicted cumulative environmental concentration for the maximum 99.8%ile 1-hour result and maximum annual mean result for NO<sub>2</sub> falls below the AQS and therefore the effect of NO<sub>x</sub> emissions from the Proposed Development can be deemed as negative and long-term but not significant in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance.

#### Sensitive Receptors (Human Health)

The maximum cumulative predicted cumulative environmental concentrations at all receptors in the model (including sensitive receptors) are included in the above modelling results (Table 11.17) and fall below the AQS 99.8%ile 1-hour and annual mean limits for NO<sub>2</sub> for the protection of human health.

The maximum cumulative predicted environmental concentrations for annual mean NO<sub>2</sub> at the sensitive receptors relating to human health are documented in Table 11.18.

The maximum cumulative annual mean PC for NO<sub>2</sub> at sensitive receptors relating to human health was 5.48 µg/m<sup>3</sup> at SR7 (Large-Scale Residential Development) and occurred in the model run using the 2018 meteorological data. This was combined with the appropriate background

concentration ( $12.15 \mu\text{g}/\text{m}^3$ ) to give an overall maximum annual ground level concentration of  $17.63 \mu\text{g}/\text{m}^3$ .

With respect to the protection of human health, the annual average  $\text{NO}_2$  AQS limit is  $40 \mu\text{g}/\text{m}^3$ . The predicted environmental concentration of  $17.63 \mu\text{g}/\text{m}^3$  represents 44% of the AQS for the protection of human health.

**Table 11.18:** Cumulative Air Dispersion Modelling Results – Maximum Annual NO<sub>2</sub> Concentration for surrounding Sensitive Receptors (Human Health)

| Sensitive Receptors |                                     | UTM Coordinates (Zone 29N) |          | Year of Max Predicted Results | Max Annual NO <sub>2</sub> PC conc. (µg/m <sup>3</sup> ) | Bkgrd. Concentration (µg/m <sup>3</sup> ) | Max Annual NO <sub>2</sub> PEC conc. (µg/m <sup>3</sup> ) | Predicted Result as Percentage of AQS |
|---------------------|-------------------------------------|----------------------------|----------|-------------------------------|----------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------|---------------------------------------|
| No                  | Description                         | Easting                    | Northing |                               |                                                          |                                           |                                                           |                                       |
| SR1                 | School                              | 676482                     | 5955764  | 2020                          | 3.22                                                     | 12.15                                     | 15.37                                                     | 38%                                   |
| SR2                 | Dwelling                            | 676360                     | 5956035  | 2021                          | 3.18                                                     |                                           | 15.33                                                     | 38%                                   |
| SR3                 | Dwelling                            | 676330                     | 5956435  | 2019                          | 4.30                                                     |                                           | 16.45                                                     | 41%                                   |
| SR4                 | Dwelling                            | 676808                     | 5956363  | 2021                          | 3.01                                                     |                                           | 15.16                                                     | 38%                                   |
| SR5                 | Dwelling                            | 677633                     | 5957132  | 2017                          | 1.33                                                     |                                           | 13.48                                                     | 34%                                   |
| SR6                 | Museum                              | 678498                     | 5956728  | 2017                          | 1.15                                                     |                                           | 13.30                                                     | 33%                                   |
| SR7                 | Large-Scale Residential Development | 676632                     | 5955920  | 2018                          | 5.48                                                     |                                           | 17.63                                                     | 44%                                   |
| SR8                 |                                     | 676701                     | 5955819  | 2020                          | 4.78                                                     |                                           | 16.93                                                     | 42%                                   |

As the maximum predicted environmental concentrations at human health sensitive receptors are well below the relevant AQS, the cumulative effect of NO<sub>x</sub> emissions from the Proposed Development can be deemed as negative and long-term but not significant in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance.

#### Sensitive Receptors (Ecological Sites)

The critical level for annual NO<sub>x</sub> for the protection of vegetation is specified as 30 µg/m<sup>3</sup> in Annex XIII of Directive 2008/50/EC on ambient air quality and cleaner air for Europe Directive implemented in Ireland by the Air Quality Standards Regulations 2022 (S.I. No. 739 of 2022). This critical level for NO<sub>x</sub> is not habitat specific, but has been set to cover broad vegetation types and is the level below which significant harmful effects are not thought to occur.

The results of the air dispersion model show that the highest cumulative ground level concentration of NO<sub>x</sub> occurred at SR10 (River Boyne and River Blackwater SAC) with a predicted PC NO<sub>x</sub> value of 9.13 µg/m<sup>3</sup>. Using a background NO<sub>x</sub> concentration of 18.74 µg/m<sup>3</sup> (refer to Section 11.3.1 of this report) the maximum annual average PEC at the River Boyne and River Blackwater SAC is equivalent to 93% of the AQS.

**Table 11.19:** Cumulative Air Dispersion Modelling Results – Maximum Annual NO<sub>x</sub> Concentration for surrounding Sensitive Receptors (Ecological Sites)

| Sensitive Receptors |                                               | UTM Coordinates (Zone 29N) |          | Year of Max Predicted Results | Max Annual NO <sub>x</sub> PC conc. (µg/m <sup>3</sup> ) | Bkgrd. Concentration (µg/m <sup>3</sup> ) | Max Annual NO <sub>x</sub> PEC conc. (µg/m <sup>3</sup> ) | Predicted Result as Percentage of AQS |
|---------------------|-----------------------------------------------|----------------------------|----------|-------------------------------|----------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------|---------------------------------------|
| No                  | Description                                   | Easting                    | Northing |                               |                                                          |                                           |                                                           |                                       |
| SR9                 | River Boyne and River Blackwater SAC          | 676552                     | 5955646  | 2020                          | 2.32                                                     | 18.74                                     | 21.06                                                     | 70%                                   |
| SR10                |                                               | 676956                     | 5955794  | 2021                          | 9.13                                                     |                                           | 27.87                                                     | 93%                                   |
| SR11                |                                               | 677418                     | 5955797  | 2017                          | 4.27                                                     |                                           | 23.01                                                     | 77%                                   |
| SR12                | Boyne Estuary SPA (South)                     | 676759                     | 5955479  | 2020                          | 1.78                                                     |                                           | 20.52                                                     | 68%                                   |
| SR13                |                                               | 677007                     | 5955560  | 2018                          | 2.44                                                     |                                           | 21.18                                                     | 71%                                   |
| SR14                |                                               | 677352                     | 5955621  | 2021                          | 3.40                                                     |                                           | 22.14                                                     | 74%                                   |
| SR15                | Boyne Estuary SPA / Boyne Coast & Estuary SAC | 677913                     | 5956072  | 2017                          | 2.42                                                     |                                           | 21.16                                                     | 71%                                   |
| SR16                |                                               | 677913                     | 5956072  | 2017                          | 2.18                                                     |                                           | 20.92                                                     | 70%                                   |
| SR17                |                                               | 677913                     | 5956072  | 2017                          | 1.15                                                     |                                           | 19.89                                                     | 66%                                   |
| SR18                |                                               | 677913                     | 5956072  | 2017                          | 0.67                                                     |                                           | 19.41                                                     | 65%                                   |



All sensitive receptors representing the nearest Natura 2000 sites to the Proposed Development (River Boyne and River Blackwater SAC, Boyne Coast & Estuary SAC and Boyne Estuary SPA) show predicted cumulative PC and PEC NO<sub>x</sub> values below the AQS annual mean limit of 30 µg/m<sup>3</sup> for protection of vegetation and ecosystems.

The contour plots included in Appendix B of this EIAR illustrate that highest predicted ground level concentrations of NO<sub>x</sub> occur close to the boundary of the Proposed Development with concentrations decreasing with distance from the facility. Therefore, the results at the nearest Natura 2000 sites are considered worst case. Potential ground level concentrations at other Natura 2000 sites further away from the Proposed Development will be below these results and below the AQS annual mean limit of 30 µg/m<sup>3</sup> for protection of vegetation and ecosystems.

It is noted that a suitably conservative approach has been taken in the modelling. Gas engines emissions were modelled under continuous operation for the full year (24/7) and does not take into account the integration of onsite renewable generation, energy storage or utilisation of grid electricity, which enables the reduction/elimination of emissions from the development.

Based on the results presented above, the cumulative operational effect of air emissions on ecosystems from the Proposed Development can be deemed as negative and long-term but not significant.

#### Carbon Monoxide results

The 8-hour mean result for CO was 3,165.85 µg/m<sup>3</sup>. This result occurred in the model run using the 2019 meteorological data in Scenario 1 (9no. engines running at 100% load).

The 8-hour mean result (3,165.85 µg/m<sup>3</sup>) was combined with the appropriate background concentrations for CO (230 µg/m<sup>3</sup>) in accordance with the EPA's AG4 Guidance Note to give an overall maximum 8-hour ground level concentration of 3,395.85 µg/m<sup>3</sup>. This represents 34% of the Air Quality Standard of 10,000 µg/m<sup>3</sup>, and therefore is well within acceptable limits.

**Table 11.20:** Cumulative CO Air Dispersion Modelling Results of the Proposed Development

| Pollutant       | Averaging Period | Air Quality Standards/ Guideline Values (µg/m <sup>3</sup> ) | Predicted Max Occurred in Year | Predicted Max. Process Contribution (PC) (µg/m <sup>3</sup> ) | Background Conc. (µg/m <sup>3</sup> ) | PEC: Background + Process Contribution (µg/m <sup>3</sup> ) | Predicted Result as Percentage of AQS |
|-----------------|------------------|--------------------------------------------------------------|--------------------------------|---------------------------------------------------------------|---------------------------------------|-------------------------------------------------------------|---------------------------------------|
| Carbon Monoxide | 8 hr CO          | 10,000                                                       | 2019                           | 3,165.85                                                      | 230                                   | 3,395.85                                                    | 34%                                   |

The predicted environmental concentrations fall below the AQS. Therefore, the effect cumulative air emissions on ambient air quality from the Proposed Development can be deemed as negative and long-term but not significant.

### **11.6.3 Potential Future Phases of CORE**

As described in Section 2.11 of this EIAR, the Proposed Development to which this planning application relates is the first stage of CORE. Given the level of detail available on possible future phases of CORE, it is not possible to carry out a detailed cumulative assessment of potential effects on Air Quality for the construction and operational phases with the future phases at this time.

Potential future phases of development will be subject to separate planning applications and Environmental Impact Assessment Report (EIAR), and Industrial Emissions Licensing by the EPA as required. Future phases of the development may require additional mitigation measures to ensure the proper management of effects on Air Quality. These measures will be identified and detailed as part of the detailed design and EIAR for any additional respective phases of the development to ensure the potential future phases do not have any significant adverse effect on the water environment.

Furthermore, any subsequent EIAR's for a future phase of development will cumulatively assess any existing phases at that time.

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## 11.7 Mitigation Measures and Monitoring Effects

### 11.7.1 Construction Phase (including Demolition)

#### Mitigation Measures

In order to effectively manage all potential environmental effects during the construction phase, an Outline Construction Environmental Management Plan (CEMP) has been prepared (PM Group Doc. No. IE0313391-22-RP-0003) and accompanies this planning application. A *Demolition Management Plan* (AtkinsRéalis Report No. BEC231-ATK-A01-ZZZZ-XX-RP-EV-000003) has also been written detailing the key works and anticipated demolition methods. The CEMP sets out the responsibilities, environmental standards and requirements for the duration of the construction phase of the project. This includes the necessary environmental controls and mitigation measure to prevent/mitigate any potential effects on ambient air quality.

As part of the CEMP, the following specific mitigation measures will be put in place to minimise any dust generation and thus prevent any significant effect on air quality:

- Standard good practice construction measures, such as water spray, atomisers etc. will be implemented to minimise the generation of dust. It will be a requirement to ensure sufficient dust control measures are in place during this phase;
- Works will only be carried out subject to an agreed and approved method statement;
- Water Cannons and dust buster units will be used during demolition activities;
- All structures will undergo internal wash down prior to demolition;
- All construction vehicles will be driven on existing site roads and areas of hard standing and consequently will not transport mud or earth during movement;
- Internal site roads will be kept damp during dry periods;
- Concrete crushing facilities will be setup at locations away from sensitive areas and strictly controlled with dampening down;
- Wheel washing facilities will be in place for vehicles leaving site;
- External roads next to the site exits will be kept clean using road washer vehicles;
- All demolition and most of the construction work will be carried out within the confines of the existing production site;
- Vehicles using site roads will have their speed restricted, and this speed restriction will be enforced rigidly;
- Loose materials that are transported on or off site will be properly contained;
- Potentially dusty material being removed from the site will be transported in covered trucks, where the likelihood of emitting dust is high, and during dry weather conditions, the area of removal will be sprayed with a mobile tanker on a regular basis to control dust emissions;
- The Construction Management Team (CMT) will carry out regular inspections of all trucks and will be required to record any incidents or situations where adequate cleanliness is not achieved. The registration numbers of all trucks will be maintained by the contractor and this will ensure traceability;
- If cement is stored in a silo on site, a filter will be fitted to the silo; alternatively, ready-mix concrete will be supplied for just-in-time delivery;
- Good housekeeping and site management will be observed including the proper storage of spoil / loose materials on site;
- During dry periods, use of dust-dampening techniques (water dampening of dust on roads, use of low speed limits onsite, use of covers on dusty materials during transport and storage);

- Generation of silty water run-off (and dust) from the stockpiles will be prevented through the use of covers and silt fences;
- Exhaust emissions from construction plant and equipment operating within the site, including trucks, excavators, diesel generators and compressors, will be controlled by the contractor by ensuring that the equipment is well maintained and is operated in accordance with normal good practice.;
- All vehicles and combustion equipment will undergo appropriate inspection and maintenance to ensure proper functioning;
- Sweeping of hard road surfaces;
- Provision of a water bowser on site, regular spraying of haul roads;
- Public roads in the vicinity will be inspected and kept clean;
- Material stockpiling will be provided with adequate protection from the wind;
- Road maintenance agreement will be detailed between operator and the Local Roads Authority to clarify responsibility for the upkeep and repair of access roads during the construction phase;
- Existing boundary screening planting will be retained until the newly planted hedgerow are established reducing of dust emanating Proposed Development.

The following specific mitigation measures will be implemented for the demolition of the existing conveyor structure associated with the existing quay facility (wharf) that is directly adjacent to the River Boyne (and also the River Boyne & Blackwater SAC):

- The conveyor belt will undergo a wash down prior to demolition,
- Water Cannons and dust buster units will be used through demolition of the conveyor belt,
- Covers and silt fences will be used to capture potential sedimentation from run-off water generated during wash-down/demolition of the conveyor belt, and
- Temporary dust screening will be in place during demolition of the conveyor structure.

#### Monitoring Requirements

Dust monitoring units will be required to be in place at various locations on the site boundary perimeter during the construction phase.

Regular inspections and audits of the construction activities will be carried out by the CMT to ensure that all mitigation measures outlined in this EIAR and CEMP have been implemented in full.

### **11.7.2 Operational Phase**

#### Mitigation Measures

The Proposed Development includes nine gas engines. Engine operation load will be minimised through the implementation of energy conservation design measures and renewable energy sources. This site will be governed by an IE Licence from the EPA and all emissions to atmosphere will be controlled under this.

The CORE will adopt a number of technologies to both limit energy consumption and maximise sustainable energy generation. The proposal includes:

- Significant Photovoltaic (PV) arrays on the DC roof and southern façade, EC roof and on grade at capped Stockpile no. 3 and the Landfill;
- Building design with a high thermal performance of envelope;
- Passive water cooling will be utilised for the DC from the existing freshwater infrastructure at the PPL site to limit cooling load;
- Monitoring of energy consumption of each fuel type will implemented.

For further information on energy technologies proposed for the CORE, refer to *Chapter 12 Climate* of this EIAR and the Engineering report (document number BEC231-ATK-XXX-XXXX-XX-RP-CE-

300001) submitted with this planning application. Refer to *Chapter 1 Introduction* of this EIAR regarding the EPA licensing requirements for the site.

#### Monitoring Requirements

Appropriate emission limits and monitoring requirements will be set within the licensing regime for the site and these will be complied with in full.

### **11.8 'Do Nothing' Scenario**

In the scenario where the Proposed Development did not proceed as planned, none of the likely construction or operational effects as set out in this Chapter would occur.

#### **11.8.1 Construction Phase**

In the scenario the Proposed Development would not proceed as planned, and there would be no demolition or construction effects on the existing environment.

Therefore, this scenario can be considered to be a neutral and imperceptible effect on the environment with respect air quality in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance.

#### **11.8.2 Operational Phase**

Should the Proposed Development not go ahead, PPL intend to return to peak production at the facility under its current IE Licence. A return to the Operational Baseline Scenario (as described in Section 11.3.5 of this chapter) would result in emissions to air of NO<sub>2</sub>, NO<sub>x</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, CO and HCL from the operation of the lime kiln, multi hearth furnaces and shaft kilns at the existing PPL site. An air dispersion modelling assessment completed in 2014 is included as Attachment 11.1 of this EIAR and reflects the Operational Baseline Scenario.

The results of the air dispersion modelling assessment show GLCs of the pollutants arising from these emissions to air are in compliance with AQS. Therefore, this scenario can be considered to be a negative and long-term but not significant impact on air quality in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance.

### **11.9 Residual Effects**

#### **11.9.1 Construction Phase (including Demolition)**

With the mitigation measures outlined in Section 11.7 in place, the residual effects of the construction and demolition phase of the Proposed Development on air quality are likely to be short-term, neutral and not significant in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance.

#### **11.9.2 Operational Phase**

No significant effects were predicted for the operational phase of the Proposed Development. Based on predicted results and the conservative nature of the assessment, residual effects on air quality are likely to be long-term, neutral and imperceptible in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance.

### **11.10 Difficulties encountered during preparation of this chapter**

There were no difficulties encountered when preparing this chapter.

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## 12 Climate

### 12.1 Introduction

This Chapter has been prepared to assess the potential for effect on climate from the Proposed Development during the construction and operational phases at the Premier Periclase Ltd. (PPL) Site at Boyne Avenue, Newtownstalaban, Drogheda, Co. Louth. This chapter should be read in conjunction with *Chapter 2 Description of Proposed Development* of this EIAR.

#### 12.1.1 Global Climate Change

The global climate is rapidly changing and is transforming the world due to the effect of Greenhouse Gases (GHG). A GHG is any gas in the atmosphere that absorbs and re-emits heat which results in the planet's atmosphere being warmer than it otherwise would be.

While GHGs naturally occur in the Earth's atmosphere, increasing global temperatures are being propelled by increases in GHGs caused by human activities such as burning of fossil fuels to power industrial processes. Carbon dioxide (referred to as 'CO<sub>2</sub>' or 'carbon') is the most common GHG emitted by human activities, in terms of the quantity released and the total impact on global warming. As a result, collective GHGs are measured in units of CO<sub>2</sub> equivalent (CO<sub>2</sub>e) which is a metric used to compare the emissions from various GHGs on the basis of their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.

#### 12.1.2 Climate Impact Assessment

Premier Periclase Limited (PPL) are applying for permission for the proposed redevelopment of the PPL industrial facility at Newtownstalaban, Drogheda, Co. Louth into a Sustainably Powered Enterprise Campus known as 'CORE'. CORE will offer low carbon energy solutions to mixed use tenants in alignment with the Irish Government's sustainable economic development and industrial decarbonisation objectives. The Proposed Development to which this planning application relates is collectively known as 'Phase 1 CORE' and will comprise an Energy Centre (EC) and related infrastructure including Battery Storage, 3 MW of solar Photo Voltaic (PV) arrays, a 25.5 MW (operating capacity electrical load) Data Centre (DC) Building, and all associated and ancillary development.

The site is currently occupied by the PPL magnesia and magnesium hydroxide production facility which represents a highly carbon intensive industrial process.

The innovative energy solutions proposed on site involves the use of a connection to the national electricity grid (referred to hereinafter as 'the grid') alongside onsite solar generation, on-site flexible generation and large-scale battery energy storage system (BESS), to deliver digital services and infrastructure with minimum carbon intensity, and with a clear pathway to net-zero DC operations. This Proposed Development will act to actively support the electricity grid as opposed to other conventional large energy users whose operations tend to put a significant strain on the grid.

The Proposed Development represents an evolution of the existing industrial heritage on the site; with PPL making a transition to become a leader in industrial decarbonisation and provide sustainable economic development for the community and the country for the next 60 years.

In accordance with the requirements of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018) and the Environmental Impact Assessment Directive (EIA Directive) (2014/52/EU) this Chapter assesses the likely significant effects, if any, on climate and the environment resulting from both the:

- Effect of the Proposed Development on climate (GHG Emissions Assessment of the nature and magnitude of GHG emissions including Embodied Carbon Assessment and Operational Carbon Assessment); and



- Vulnerability of the Proposed Development to climate change (Climate Change Resilience Assessment).

This approach aligns with the recent guidance from the Institute of Environmental Management and Assessment (IEMA) *Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance* (IEMA, 2022).

An embodied carbon assessment has been completed by AtkinsRéalis for the Proposed Development and is summarised within this Chapter. All information relating to the embodied carbon assessment presented herein has been provided by AtkinsRéalis.

Energy and emissions modelling of the Proposed Development has been completed by Gyrogy Ltd. in co-operation with Baringa Partners LLP and is described in detail in the Energy and Emissions Modelling Report which accompanies this planning application. The energy and emissions modelling is summarised within this Chapter as appropriate.

In accordance with the IEMA (2022) Guidance, this Climate Impact Assessment assesses:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050. For the purposes of this assessment, the Carbon Budgets and Sectoral Emission Ceilings set out for Ireland in the *Climate Action Plan 2024* (CAP24) under the *Low Carbon Development (Amendment) Act 2021* (refer to Section 12.3 of this Chapter) have been used to provide context for the assessment where appropriate.
- The level of mitigation taking place.

Demonstration of the Proposed Development's compliance with Section 15 of the *Low Carbon Development (Amendment) Act 2021* is also assessed throughout this chapter as appropriate and is further developed in Attachment 12.1.

## 12.2 Characteristics of the Proposed Development

The Proposed Development to which this planning application relates is the first phase of CORE, and will consist of extensive works that will transform the ca. 35.6 hectare site and set it on a path that will result in it becoming a sustainably powered enterprise campus.

The Proposed Development consists of:

- The demolition of existing buildings, structures, and services associated with the PPL facility, as well as site clearance and remediation works.
- The careful sequestering of the licensed (inert) landfill onsite in accordance with all ongoing and future requirements of the EPA.
- A number of existing buildings and structures will be maintained as part of the Proposed Development, such as a Workshop Building, part of a Crane Store structure, 3 no. Lime Silos and water tanks and infrastructure, all of which have been incorporated into the design where beneficial and appropriate.
- The construction of a three storey Energy Centre (EC) building, a three storey Data Centre (DC) building, a single storey Facility Operations Centre (FOC) building, a single storey Pump and Filtration Building, a single storey Security Gatehouse and a Security Kiosk at the main site entrance of the site.
- The provision of a Battery Energy Storage System (BESS) Compound, an ESB Substation, a Cooling Compound, a Thermal Store Compound, a Pump and Filtration System, other ancillary structures including a Firewater Tank, a Fire Fighting Water Pump Building, a Control Building, a Maintenance Yard and Waste Management facilities. Ground-mounted solar Photo Voltaic (PV) arrays will also be provided on the existing licensed landfill and stockpile no. 3, along with 3 no. compact substations.
- The provision of all associated works including access arrangements, internal roadways and footpaths, car and cycle parking, boundary treatments, landscaping and services, and all ancillary works.

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A detailed description of the Proposed Development is included in *Chapter 2 Description of Proposed Development* of this EIAR, which includes details of the demolition works required, details of the construction of the new buildings and structures, and details of the various elements that will make up the Proposed Development when it will be operational.

The following subsections provide details of the various phases of the Proposed Development which have the potential to give rise to effects on climate.

#### **12.2.1 Construction Phase (including Demolition)**

As listed above, the Proposed Development will include the demolition of most of the main existing industrial structures on site, site clearance and remediation works, and the construction of the first phase of a new commercial and technology development on the overall landholding.

Some existing infrastructure at the existing site will be retained for the purpose of respecting the architectural heritage of the site and additionally, to facilitate the new, cleaner activities onsite where appropriate, including via the improvement of that existing infrastructure where beneficial and appropriate. Existing resources available on site will be utilised such as the 38 KV electricity connection, 4 bar gas connection from the Gas Networks Ireland 70 Bar line running through the site, and private water systems to support the Proposed Development.

#### **12.2.2 Operational Phase**

The proposed upgrades to existing infrastructure, alongside the integration of renewable energy sources and advanced energy storage systems will provide a new infrastructure line-up at the sustainably powered enterprise campus which will have significantly decarbonised (trending towards fully decarbonised) electrical and heat networks. The first tenant and Large Energy User (LEU) for the campus will be the 32 MW DC which is included in the Proposed Development to which this application relates.

The CORE EC will play a pivotal role in supporting sustainable and regenerative energy systems both within the campus itself, and also within the wider community. The campus will adopt a number of technologies to both limit energy consumption and maximise sustainable energy generation. The proposal includes a significant solar photovoltaic (PV) array on the DC Building roof and southern façade, EC roof and on grade at capped Stockpile no. 3 and the Landfill.

Where fossil fuels are required, the scheme will seek to minimise the environmental effects through the use of less carbon-intensive natural gas engines, instead of more widely used diesel generators.

The key sustainability goals for the Proposed Development are listed in *Chapter 2 Description of Proposed Development* of this EIAR and all contribute to a holistic approach to sustainability for the project covering a broad range of sustainability drivers.

The proposed DC Building will include data halls and associated support spaces (plant and built space). Eight data hall modules are distributed onto three floors; on each floor, additional office and storage spaces will also be provided, with further administrative and loading spaces on the ground floor.

#### **Proposed Energy Infrastructure**

Gyrog are an energy technology and services company with particular expertise in the supply of significantly decarbonised energy to large energy users. Gyrog has developed a patented energy controls system (Patent Pending: PCT/EP2021/059979) and a deployment strategy for those assets that make up that system that enables the supply of class leading sustainable power, flexible generation and potential electricity grid support services.

The proposed CORE EC will include innovative energy technology solutions such as Gyrog energy technology or equivalent technology solutions, with the aim of reducing carbon emissions in real-time, facilitating the integration of higher levels of renewable energy on the electricity grid, and providing resilient and conditioned power for industrial and digital infrastructure. Gyrog's strategic focus revolves around the creation of distributed energy infrastructure, allowing LEUs to

significantly decarbonise their own operations, actively contributing to energy transition, rather than hindering it.

The CORE EC operates at Medium Voltage (MV) and incorporates power electronics and switchgear that operate as the manifold for the flows of electricity from all assets on site (a mix of onsite renewable generation, energy storage, gas generation) and the grid. This system enables makes possible the provision of power conditioning services and the balancing energy imports from the gas grid (including biomethane), off-site renewable energy power purchase agreement (PPA), and electricity grid imports. PPL will optimise the import, storage or production of energy, based on real-time emissions constraints to significantly decarbonise industrial operations, and provide real-time flexibility to the energy systems.

The CORE EC can be considered as a “Grid-Edge” Asset with the ability to potentially provide power quality and power export services to the electricity network, which would provide a valuable balancing service to the electricity grid. It will augment the grid-supply to provide significantly decarbonised conditioned power to the proposed on-campus DC. This results in infrastructure that is more sustainable and cost effective, while being more resilient, fault-tolerant and concurrently maintainable. This extra reliability could also be afforded to the grid itself through the aforementioned grid power quality, capacity and balancing services the system can provide.

The Proposed Development will operate both as a Consumer and Producer of electricity. Electricity will be consumed when the grid’s fuel-mix is predominantly renewable and electricity demand on the grid is low which will usually occur at night. At peak electricity demand, the grid is most vulnerable and at its highest carbon intensity due to the increased demand requiring older more carbon intense national energy generators (e.g. coal) to be switched on to provide the necessary extra power to meet demand. At these times, the Proposed Development will provide a flexible demand response and support the loads with its own assets.

The CORE EC, coupled with renewable electricity generation, will enable the reduction/elimination of emissions in real-time (hour-for-hour) on the campus. The CORE EC also has the ability to potentially provide a comprehensive set of grid services enabling deeper penetration of renewable energy supporting the decarbonisation of Ireland’s grid.

An overview of the proposed technologies to be employed at the Proposed Development is illustrated in Figure 12.1.

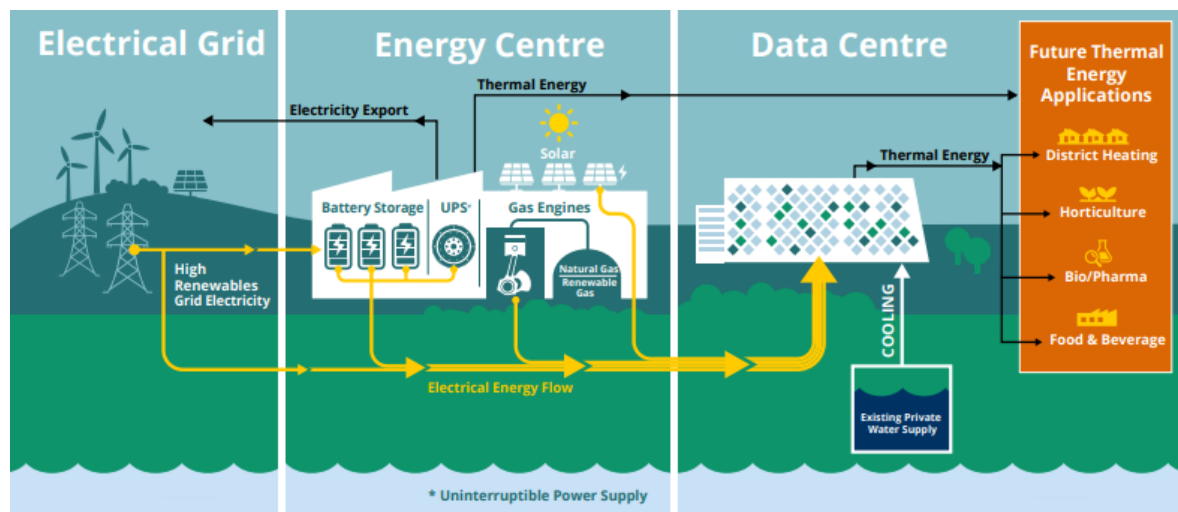


**Figure 12.1:** Overview of the Energy Technology to be employed at the Proposed Development

### Electrical Grid Connection

In the north-west corner of the site, the intention is to utilise the existing entrance on the L2307 road to facilitate access to the site with a separate access gate for the ESB to access the on-site substation. This substation will be powered by the existing Newtownstalaban sub-station via a

cable that the ESB will run along the L2307. The substation itself consisting of two separate transformers will step down the 38kV incoming power to 20kV, which will be the voltage rating for the on-site MV system consisting of the CORE EC and associated energy infrastructure. The compound that houses the substation will be segregated with one side accessible to ESB and one side for site staff. The substation control room within the compound will be similarly segregated.

Section 4 and 5 of the *Energy and Emissions Modelling Report* describe in detail how the Proposed Development will import and electricity to the grid depending on grid emissions intensity and market conditions (with the potential to also export electricity should there be agreement in place with the Systems Operator to do so) as follows:

- Contracted renewable electricity (PPA) will be imported to the campus through the public grid.
- This will be supplemented by imports from the electricity market when the grid's carbon intensity is lower than that of the energy sources available at the Proposed Development.
- Otherwise, the CORE EC will rely on its on-site energy resources and reduce the demand on the grid.
- If the grid comes under stress or has very high emissions intensity; the CORE EC will have the ability to export power (and grid services as required) to assist.

Operating in this way, the Proposed Development will act to actively alleviate strain on the electricity grid and.

#### **On-Site Solar Generation**

The site has high solar potential relative to other locations in Ireland and is south facing and inclined towards the south. There is a land-use balance to be maintained when using industrial zoned land for solar generation; however the Proposed Development will optimise the use of roofs and facades for solar electricity generation. 3 MW of solar PV arrays are included with the Proposed Development. There are two stockpile areas on the campus that are unsuitable for development (the landfill to the east of the site and Stockpile number 3) and can be utilised for ground mounted solar. Further information is provided in Sections 2.6.4 and 2.6.5 in *Chapter 2 Description of Proposed Development* of this EIAR.

#### **On-Site Kinetic Energy Storage & Power Quality (Primary Reserve)**

Central to the power electronics line-up for the CORE EC is a Medium Voltage (MV) Rotary Uninterruptible Power Supply (UPS) system with a capacity of 37.8 MW coupled to a Rotary Kinetic Energy Storage system (or equivalent systems). This parallel array will provide protection from a broad spectrum of utility voltage events and will supply continuous clean power to the protected load with enough autonomy to support it for 20 seconds.

The power characteristics and inertia of this rotating machine will ensure smooth transitions between the various energy generation and storage systems that support the load including: solar generation; gas generation; battery energy storage; and the grid itself.

As well as protecting the load, it is also configured to potentially protect the Grid. Many of the frequency containment services that can be exported to the grid are delivered through the power electronics of the UPS System.

#### **On-Site Battery Energy Storage System (BESS) (Secondary Reserve)**

The BESS is a 36 MW grid-scale lithium-ion battery array that will act as a secondary reserve to the UPS system. For load protection, it will take over from the UPS system within 150-200 ms which preserves 99% autonomy of the UPS and will support the load for up to 3 hours.

The BESS System has a central role in displacing real-time emissions. It will store renewable electricity from the grid when available and discharge during periods of higher grid emissions intensity. Time-shifting of electricity consumption (emissions) is a key element of the demand response characteristics of the site.

It could also provide a comprehensive range of grid services (frequency containment and restoration) and could potentially displace conventional generators that provide these services. Due

to its quicker response, it could provide these services without taking up the capacity that “must-run” generators do, and significantly decarbonise the operation of the grid itself.

Generally, the BESS batteries will charge at night when electricity demand on the grid is low and are discharged in the following evening peak, when demand is high, to help reduce peak demand on the grid.

### **On-Site Gas Engines (Tertiary Reserve)**

Tertiary reserve will be provided from nine 4.5 MW (electrical output) reciprocating gas engines allowing a gradual hand-off of load from the batteries. This configuration overcomes the load acceptance limitations of gas engines while out-performing diesel engines for emissions and overall efficiency.

The reciprocating gas engines can accept 100% load in less than 5 minutes which preserves 98% autonomy of the BESS and will allow the load to be supported for hours/days.

The engines are constrained to operate only if they outperform the marginal generator on the grid for emissions intensity. They are used for demand response but could potentially export at times when there is a scarcity of generation on the grid should there be an agreement in place with the Systems Operator to provide such services.

When the campus can produce its own electricity at lower emissions than the grid, it will do so. This is central to the real-time emissions strategy of the EC and reducing the load on the grid at peak times.

The campus will aim to secure a long-term supply of biomethane to reduce dependence on natural gas. The engines have also been tested at full-load on 100% Hydrogen, ensuring that as zero emission gases become available in future, the campus can keep ahead of the energy transition as it proceeds to 2050.

### **Corporate Power Purchase Agreements (cPPA)**

Prior to the commencement of DC operations, the applicant shall provide the Planning Authority with written evidence of having in place 60 MW Annual Wind corporate power purchase agreements (PPA) or, one or more cPPA delivering an equivalent combined supply.

Current industry practice assumes that a 60MW PPA would generate enough renewable energy annually to match the DC's yearly electricity consumption. While this is reflective of the approach often proposed in respect of a typical DC, it is an approach that overlooks periods when no wind energy is produced and when renewable energy is curtailed due to an excess of wind power on the system. Annual accounting allows surplus wind energy generated at one time to offset periods with no wind energy, masking real-time imbalances between energy production and consumption.

In contrast, this Proposed Development will prioritise the mitigation of real-time emissions by aligning renewable energy production with the DC's hourly consumption.

Any remaining hours not covered by the renewable energy PPA will be mitigated using other sources of energy within the EC, which includes solar, batteries, and gas engines and grid imports when the grid's carbon intensity is lower than that of the gas engines. In addition, CHP (Combined Heat and Power) will enable the heat from the DC and the EC operations to be recovered for future applications.

While corporate PPAs remain a key element for driving sustainability efforts, their effectiveness is maximized when combined with onsite renewable energy sources and demand-side flexibility technologies designed to manage emissions in real-time. This approach ensures a more immediate and effective reduction of direct and indirect greenhouse gas emissions, compared to relying solely on a corporate PPA as the primary means of annual offset.

A corporate PPA for the supply of renewable power will be entered into between the generator/supplier and the demand customer / operator of the proposed DC, which can only take place after a grant of permission for the Proposed Development and an agreement for a lease of the proposed DC is in place.



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For this reason, it is proposed that this mitigation shall be required prior to the commencement of operations rather than the commencement of development, which will allow for an appropriate period for discussions between the prospective lessee of the DC and renewable energy developers and suppliers to ensure the cPPA aligns with the final requirements of the DC.

It is envisaged that this would support the continuous reduction of emissions associated with energy demand, ensure the provision of sustainable energy for the future, and contribute to the proper planning and sustainable development of the area.

### **Electricity Production and Consumption**

In terms of electricity consumption, the campus will require 223,380 MWh of electricity (from all energy sources, including on-site infrastructure) per year, for the first phase of CORE. Through the use of the site UPS, BESS, solar PV array and gas engines, the reliance on the grid will be minimised as much as possible. The target site electricity production (solar PV array and gas engines) will contribute at least 35,000 MWh per year by 2030 to the DC's energy requirements. The use of PPAs will further reduce reliance on the grid. Further details are provided in the *Energy and Emissions Modelling Report* which accompanies this planning application

### **Gas Connection and Storage**

Gas Networks Ireland's (GNI) Drogheda Transmission Station is located adjacent to the PPL site and operates at 70 bar, which in-turn provides a 4 bar connection to an existing Above-Ground Installation (AGI) on the PPL site to serve the site gas requirements. The on-site gas distribution AGI will be modified and upgraded to suit the new operations on site. A new natural gas ring main will be constructed in order to provide a gas supply to the EC for the engines via a manifold.

### **Heat Network, Thermal Storage and the Cooling System**

Key to assessing the suitability of the site for the project is the ability to couple large electricity users with large thermal users.

The Proposed Development will have a closed secondary loop system with low temperature hot water and medium temperature hot water storage collecting waste heat from DC operations and electricity generation. It may be possible to reuse this waste heat which will be a consideration of any potential future development at the site.

DC and EC heat will be rejected using a conventional cooling tower system. This system will have the capacity to provide all cooling requirements, supplemented with some local direct expansion (DX) cooling (i.e. refrigerant based), except during peak summer temperatures where a peak assistance chilled water storage back up system will be required. For most of the year the cooling tower operates as a dry cooler, with no requirement for evaporative cooling, and therefore no freshwater requirements. During peak summer temperatures, evaporative cooling is required, with up to 240m<sup>3</sup>/day of freshwater consumed. This freshwater will be sourced from the EPA registered Littlegrange/Mell quarry abstraction regime and will be within the limits of the existing registered abstraction volumes. The water used will be released by evaporation from the cooling towers. There will be no requirement to use the public water supply for this cooling system.

### **Control System and MV Operation**

The single harmonised Energy and Power Management System (EPMS) is the overarching Supervisory Control and Data Acquisition (SCADA) system for the electrical generation and distribution system within the CORE EC. It will be the operator interface for control of the network and will provide all the automated sequencing to manage the transition between the operating scenarios. It will aggregate and manage data and provide the gateway to external supervision and control systems. It will provide the flexibility forecasting and commercial optimisation required for the CORE EC.

The CORE EC itself will operate at Medium Voltage (20 kV). Medium Voltage switchgear and control systems are more resilient than low voltage systems as well as being more efficient.

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## Real-Time Sustainable Operation

A dedicated energy services company (ESCo) team will be established to operate and maintain all energy services and utilities on the campus with the core objective of providing safe, reliable energy and utility services to campus consumers on their behalf.

It is anticipated that the ESCo team will:

- Manage all health, safety, environmental and regulatory aspects of the on-site systems on behalf of PPL. The campus DC tenant will have the contract with the energy utilities for energy supply including electricity and gas from the respective grids.
- Arrange all of the off-site energy resources including gas and electricity grid via energy retailers and any future wind/solar PPA or gas PPA imports to be held by tenant.
- Ensure that service levels for availability and reliability of systems are exceeded by operating and maintaining the fault-tolerant and concurrently maintainable systems on the campus. This means that the campus will not be affected by grid faults because it will be able to provide its own power and that all systems on site are arranged such that taking any element of the system down for maintenance does not mean the campus energy system has to shut down.

The key performance metric for the ESCo team will be the real-time carbon emissions intensity of energy on the campus for both heat and electricity, in every hour, for the lifetime of the facility. The Emissions and Energy Modelling Report which accompanies this planning application provides a detailed description of how the proposed technology at the campus will be operated to achieve a lower carbon emissions than the national grid based on the grid electricity demand, and the energy intensity of the grid at any given time due to environmental conditions.

## 12.3 Relevant Guidelines, Policy and Legislation

### 12.3.1 Climate Agreements

#### UNFCCC and The Paris Agreement

The UN Framework Convention on Climate Change (UNFCCC) was adopted in 1992 as part of a global response to the problem of climate change and has the objective of preventing '*dangerous anthropogenic interference with the climate system*'. It provides a framework to combat climate change by reducing GHG emissions and building capacity to adapt to its negative impacts. Ireland ratified the UNFCCC in 1994 and the Kyoto Protocol, which operationalises the UNFCCC, in 2002. The UNFCCC mediates negotiations in relation to GHGs reductions and technical issues such as Emission Trading and burden sharing.

The UNFCCC and the Paris Agreement adopted on 12 December 2015 under the UNFCCC ("the Paris Agreement") provides the international legal framework for addressing climate change.

The Paris Agreement entered into force on 4 November 2016. Its 196 Parties have agreed to hold the increase in the global average temperature well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels. The agreement aims to limit global GHG emissions to 40 gigatonnes as soon as possible and to achieve '*a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century*'.

The Paris Agreement requires each Party to prepare, communicate and maintain a Nationally Determined Contribution (NDC) that it intends to achieve. NDCs are submitted every five years to the UNFCCC.

Ireland has contributed to the Agreement through the NDC tabled by the European Union (EU) on behalf of Member States in 2020, which commits to a 55% reduction in EU-wide GHG emissions by 2030 compared to 1990 through the European Green Deal.

The *Emissions Gap Report 2023* published by the United Nations Environment Programme (UNEP) finds that significantly more ambitious and rapid action is required this decade to deliver

the emissions reductions required to meet the Paris Agreement goals. The report calls for all nations to accelerate economy-wide, low-carbon development transformations.

The most recent Conference of the Parties (COP 28) was held in Dubai, United Arab Emirates in November and December 2023. COP28 marked the conclusion of the first '*global stocktake*', the main mechanism for assessing progress under the Paris Agreement. The results showed that progress was too slow across all areas of climate action – from reducing GHG emissions, to strengthening resilience to a changing climate, to getting the financial and technological support to vulnerable nations. Countries responded with a decision on how to accelerate action across all areas by 2030. This includes a call on governments to speed up the transition away from fossil fuels to renewables such as wind and solar power in their next round of climate commitments.

### The European Green Deal

The European Green Deal aims to transform the EU into a modern, resource-efficient and competitive economy, ensuring no net emissions of GHGs by 2050. It also increases the EU-wide GHG emissions reduction target to at least 55% for 2030 to limit warming to 1.5°C and align with the goal of the Paris Agreement. A key pillar of the Green Deal requires decarbonising energy systems.

In 2021, under "*Fit for 55*", the European Commission proposed an upward revision of the RED II target to a 40% binding EU target for energy from renewable sources in overall gross final energy consumption (commonly referred to as overall 'RES') by 2030. Then in May 2022 the EU Commission published '*REPowerEU*.' It proposed, among other measures, that the EU 'boost' its RES targets and seek to deliver them more quickly than previously planned. Part 2 was entitled '*Pillar 2: accelerate delivery of European Green Deal*'. The express aim of this pillar was to act quickly to achieve diversification of gas supplies and reduction of EU fossil fuel dependency. To support this objective, legislative amendments were planned in addition to those proposed within '*Fit for 55*'. This led to amendment of the Renewable Energy Directive, Energy Efficiency Directive, and the Energy Performance of Buildings Directive, all within the text of RED III. RED III was published in the Official Journal of the EU (OJEU) on 31 October 2023 and entered into force on 20 November 2023. Under RED III, the EU RES target has now been increased to 42.5% with a stated aim that Member States will collectively achieve 45%.

*Council Regulation (EU) 2018/1999 of 11 December 2018 on the Governance of the Energy Union and Climate Action, OJ L 328* (Energy Union Governance Regulation) set a range of administrative measures including a binding requirement that Member States 'pledge' their contribution to the 2030 RES target, and submit detailed integrated national energy and climate plans (NECPs) to the Commission stating how they will achieve this pledge. These can be modified periodically, but only to reflect an increased overall ambition as regards the 2030 targets for energy and climate. Ireland submitted a NECP in December 2018 and Ireland's updated *NECP 2021 – 2030* was submitted to the European Commission on 22 July 2024.

### European Union Emissions Trading System

Ireland also participates in the European Union (EU) Emissions Trading System (EU ETS), a tool for reducing GHG for the relevant sectors covered by this system as required under the European Commission (EC) (GHG Emissions Trading) Regulations 2012, (S.I. No. 490 of 2012) and amending Regulations. The trading scheme applies to certain types of activity which produce GHGs. The types of activities which require a GHG permit are listed in Annex I of the EU ETS Directive 2003/87/EC. The overall volume of GHG that can be emitted by sectors covered by the EU ETS is limited by a 'cap' on the number of emission allowances. Within the cap, companies receive or buy emission allowances, which they can trade as needed. The cap decreases every year, ensuring that total emissions fall.

The EU ETS is operated in phases, with the current Phase running from 2021 to 2030. The EU wide emissions cap is set to reduce by an annual rate of 2.2% for the period 2021 to 2025. From 2026 onwards this annual reduction rate will increase as the EU acts to meet more ambitious emissions reduction targets. The annual reduction targets are binding on the EU traded sector as a whole, and not on any one individual installation.

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### 12.3.2 Climate Action and Low Carbon Development (Amendment) Act 2021

In 2021, Ireland signed its Climate Action and Low Carbon Development (Amendment) Act (No. 32/2021) into law, updating the Climate Action and Low Carbon Act 2015 (No. 46/2015) to provide a legally binding framework for achieving our international and EU climate targets. This law aims to set out a path to net-zero emissions by no later than 2050, and through carbon budgets, to provide a 51% reduction in GHG emissions by 2030 (relative to 2018). It is noted that unlike the EU target, this national climate target is an economy wide target, which includes the ETS and Land Use, Land-use Change and Forestry (LULUCF) related GHG emissions. The national Climate Act puts in place a rigorous governance structure, including a system of carbon budgeting, sectorial emissions ceilings, annual Climate Action Plans, and Long-term Climate Action Strategies to be updated at least once every five years, to ensure Ireland achieves its national, EU and international climate commitments in the near and long-term.

The '*national climate objective*' included in the Act is as follows: '*The State shall so as to reduce the extent of further global warming, pursue and achieve, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy*'. A climate neutral economy is a sustainable economy and society where GHG emissions are balanced or exceeded by the removal of GHGs.

Section 15 of the National Climate Act states that '*a relevant body shall, in so far as practicable, perform its functions in a manner consistent with—*

- (a) *the most recent approved climate action plan,*
- (b) *the most recent approved national long term climate action strategy,*
- (c) *the most recent approved national adaptation framework and approved sectoral adaptation plans,*
- (d) *the furtherance of the national climate objective, and*
- (e) *the objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State.'*

The relevant plans and documents relating to the items listed in Section 15 of the Climate Action and Low Carbon Act 2015 as amended in 2021 are set out below and compliance of the Proposed Development with same is assessed under Sections 12.8 and 12.9 of this EIAR Chapter.

Demonstration of the Proposed Development's compliance with Section 15 of the *Low Carbon Development (Amendment) Act 2021* is summarised in Attachment 12.1.

### 12.3.3 Climate Action Plan 2024

The Department of the Environment, Climate and Communications approved the most recent Climate Action Plan 2024 (CAP24) in May 2024 under the Climate Action and Low Carbon Development (Amendment) Act 2021.

The plan upholds the national carbon budgets and sectoral emissions ceilings approved by the Government in July 2022, and sets out a roadmap for taking action to halve Ireland's emissions by 2030 and reach net zero by 2050.

The CAP24 builds upon previous plans by refining and updating the measures and actions required to deliver the carbon budgets and sectoral emissions ceilings for key sectors including Electricity, Transport, Built Environment, Industry, and Agriculture. It states that transformational policies, measures and actions, and societal change are required to increase the deployment of renewable energy generation, strengthen the electricity grid, and meet the demand and flexibility needs required for the challenges of:

- Increasing renewable generation to supply 80% of demand by 2030 through the accelerated expansion of onshore wind and solar energy generation, developing offshore renewable generation, and delivering additional grid infrastructure;

- Developing micro- and small-scale generation, as well as community projects, through actions such as grant funding and enabling small-scale production to participate in energy markets;
- Transforming the flexibility of the electricity system by improving system services and increasing storage capacity;
- Developing tools and mechanisms that support demand side flexibility services which leverage smart metering, including market incentives and smart tariffs, reducing/removing regulatory barriers, and focusing on flexibility-ready standards for smart technology; and
- Delivery of at least 2 GWs of new flexible gas-fired generation.

#### Carbon Budgets – Ireland

A carbon budget represents the total amount of emissions, measured in tonnes of CO<sub>2</sub>e, that may be emitted by a country or region during a specific time period. Under the Climate Action and Low Carbon Development (Amendment) Act 2021, carbon budgets have been set by the Climate Change Advisory Council (CCAC) for the periods 2021-2025; 2026-2030 with the aim of achieving the 51% reduction in GHG emissions by 2030. The CAP24 also includes the provisional carbon budget programme for 2031 to 2035 currently being finalised by the CCAC. Refer to Table 12.1.

**Table 12.1:** Ireland's Carbon Budgets (Source: CAP24)

| Budget Period                   | 2021 - 2025 | 2026 – 2030 | 2031 – 2035 (provisional) |
|---------------------------------|-------------|-------------|---------------------------|
| <b>MtCO<sub>2</sub></b>         | 295         | 200         | 151                       |
| <b>Annual Average Reduction</b> | 4.8%        | 8.3%        | 3.5%                      |

#### Sectoral Emission Ceilings and Key Performance Indicators (KPIs)

Sectoral emissions ceilings set out the maximum amount of GHG emissions that are permitted in different sectors of the Irish economy during a budget period. In July 2022, the government approved the sectoral emissions ceilings for the first two carbon budget periods (2021-2025 and 2026-2030)<sup>141</sup>.

The sectoral emissions ceiling set for the budgeting periods for relevant Sectors of Industry, Electricity are presented in Table 12.2.

**Table 12.2:** Sectoral Ceilings and Carbon Budgets (Source: CAP24 and Sectoral Emissions Ceilings Report 2022)

| Sector             | Sectoral Carbon Budget 2021 to 2025 MtCO <sub>2</sub> | Sectoral Carbon Budget 2026 to 2030 MtCO <sub>2</sub> | Emissions in Final Year of 2026 – 2030 carbon budget period (MtCO <sub>2</sub> ) |
|--------------------|-------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------|
| <b>Industry</b>    | 30                                                    | 24                                                    | 4                                                                                |
| <b>Electricity</b> | 40                                                    | 20                                                    | 3                                                                                |

CAP24 also includes a number of key targets required to achieve the carbon abatement reductions for each sector in each of the successive carbon budgets. The 2025 and 2030 key targets for the Electricity and Industrial sectors from CAP24 are summarised in Table 12.3.

<sup>141</sup> Government of Ireland, "Sectoral Emissions Ceilings", September 2022, <https://www.gov.ie/en/publication/76864-sectoral-emissions-ceilings/>, accessed 13 May 2024.



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**Table 12.3:** Summary of 2025 and 2030 Key Targets for the Industry and Electricity Sectors from CAP24

| Target                                              |                        | 2025                                                               | 2030                                                        |
|-----------------------------------------------------|------------------------|--------------------------------------------------------------------|-------------------------------------------------------------|
| <b>Sector: Industry</b>                             |                        |                                                                    |                                                             |
| Carbon Neutral Heating                              |                        | 50- 55% share of carbon neutral heating.                           | 70 – 75% share of carbon neutral heating.                   |
| Decrease Embodied Carbon in Construction Materials  |                        | Decrease by 10% for materials produced and used in Ireland.        | Decrease by 30% for materials produced and used in Ireland. |
| Reduce Fossil Fuel Demand through Energy Efficiency |                        | Reduce fossil fuel demand by 7% through energy efficient measures. | Reduce fossil fuel demand by 10% through energy efficient   |
| <b>Sector: Electricity</b>                          |                        |                                                                    |                                                             |
| Renewable Energy Generation                         | Renewable Electricity  | 50%                                                                | 80%                                                         |
|                                                     | Onshore Wind Capacity  | 6 GW                                                               | 9 GW                                                        |
|                                                     | Solar PV Capacity      | Up to 5 GW                                                         | 8 GW                                                        |
|                                                     | Offshore Wind Capacity | -                                                                  | At least 5 GW                                               |
| New Flexible Gas Plant                              |                        | -                                                                  | At least 2 GW                                               |
| Demand Side Flexibility                             |                        | 15 – 20%                                                           | 20 – 30%                                                    |

#### 12.3.4 Ireland's Long Term Strategy on GHG Emissions Reductions 2024

Ireland's Long-term Strategy on Greenhouse Gas Emissions Reductions 2024<sup>142</sup> is prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021 and sets out Ireland's 2050 climate action targets and describes sector-specific pathways to reaching those targets. The Strategy provides a pathway to a whole-of-society transformation and serves as a vital link between shorter-term Climate Action Plans and Carbon Budgets and the longer-term objective of the European Climate Law and Ireland's National Climate Objective.

The Long-term Strategy covers, with a perspective of at least 30 years:

- total greenhouse gas emission reductions and enhancements of removals by sinks;
- emission reductions and enhancements of removals in individual sectors, including electricity, industry, transport, the heating and cooling and buildings sector (residential and tertiary), agriculture, waste and land use, land-use change and forestry (LULUCF);
- expected progress on transition to a low greenhouse gas emission economy, including greenhouse gas intensity, CO<sub>2</sub> intensity of gross domestic product, related estimates of long-term investment, and strategies for related research, development and innovation;

<sup>142</sup> Department of the Environment, Climate and Communications (2024), "Long-term Strategy on Greenhouse Gas Emissions Reductions", <https://www.gov.ie/en/publication/e4e81-long-term-strategy-on-greenhouse-gas-emissions-reductions/>, accessed 21 August 2024.

- the expected socio-economic effect of the decarbonisation measures, including aspects related to macro-economic and social development, health risks and benefits and environmental protection; and
- links to other national long-term objectives, planning and other policies and measures, and investment.

In relation to sectoral emission ceilings and the CAP24, the Long Term Strategy states:

*‘The management of electricity demand will be a central part of our approach to achieving emissions reductions. Similarly, unlocking the flexibility of large electricity demand users will be a key challenge as the electricity system is decarbonised. Energy demand, including data centres, will be expected to operate within sectoral emissions ceilings and further signals will be required to locate demand where existing or future electricity grid is available and close to renewable energy generation. Research and development in energy storage and flexibility (such as a science challenge to industry) will be required to put Ireland on a pathway to net zero-carbon data centres.’*

In relation to the pathway to climate neutrality by sector, the Long Term Strategy states the following in relation to the Electricity Sector;

*‘Accelerating the deployment of wind and solar power is a central pillar of long-term decarbonisation of the electricity system which aligns with Ireland’s EU commitment’s and support for the RePowerEU Plan. Deployment of renewable electricity presents challenges, as production is variable, and electricity is not easily stored as energy in a liquid or gaseous form. Therefore, Ireland will focus on a variety of actions set out in the Climate Action Plan to increase the flexibility of Ireland’s electricity system. Electricity will be a key enabler in decarbonising other sectors of our economy, primarily through the increased electrification of the transport and built environment sectors.*

*To reach Ireland’s climate neutral target, the power sector will need to deliver its own reduction in emissions and support the decarbonisation of multiple other sectors and enduses. The electrification of transport, built environment, and certain industry uses is expected to double electricity demand by 2050, which makes it extremely challenging to continue to deliver increasing rates of renewable penetration. . . .*

*. . . The pathway outlined above will require market mechanisms that support intermittent energy sources, as well as provision of capacity and effective market signals to produce a reliable demand-side response.’*

In relation to the pathway to climate neutrality by sector, the Long Term Strategy states the following in relation to the Industry Sector;

*Full decarbonisation of the industry sector poses significant challenges. There is no known way to deliver complete decarbonisation in some industry sub-sectors, such as cement. This means that the sector will need to reduce emissions as much as possible and use negative emissions to offset these remaining emissions. Delivering this pathway will require integrated action amongst industrial players, the power sector and Government. . . .*

*Achieving a fully decarbonised industry sector will require; driving material efficiency in construction to reduce embodied energy in materials; employing heat pumps for low-temperature heat and zero emissions gas/ bioenergy for high-temperature heat; fully switching fuel used for cement (e.g., waste, bioenergy) and alumina; and utilising Carbon Capture and Storage (CCS) and innovative binders in cement.’*

### 12.3.5 National Adaption Framework 2024

In June 2024, the Department of the Environment, Climate and Communications published an update to the 2018 National Adaption Framework (NAF)<sup>143</sup> developed under the Climate Action and Low Carbon Development Act 2015.

<sup>143</sup> Department of the Environment, Climate and Communications (2024), “National Adaption Framework”, <https://www.gov.ie/en/publication/fbe331-national-adaptation-framework/>, accessed 22 Aug 2024

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Climate adaptation refers to action that helps reduce vulnerability to, and avail of potential benefits from expected impacts of climate change. In Ireland extreme weather events include flooding, drought, loss of biodiversity, sea level rise and increased temperatures.

The NAF sets out the national strategy to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts. It requires local authorities to integrate climate resilience into their policies, strategies, and plans. This includes ensuring that climate adaptation is a central consideration in decision making processes, resource allocation and regulatory frameworks. The NAF also requires the private sector, including businesses and industry to implement climate resilient practices within its operations, supply chains, and infrastructure.

At a more granular level, the NAF highlights the importance of EIARs for relevant development projects to provide clarity on whether climate resilience has been appropriately considered in the design and implementation of a development scheme.

### 12.3.6 Louth County Development Plan 2021 to 2027

The Louth County Development Plan 2021 to 2027 (LCDP) states the aim of Louth County Council 'to promote, support and direct effective climate action policies and objectives that seek to improve climate outcomes across the settlement areas and communities of County Louth helping to successfully contribute and deliver on the obligations of the State to transition to low carbon and climate resilient society through the encouragement and integration of appropriate mitigation and adaptation considerations and measures into all development.'

The LCDP refers to the high-level goals included in the "Louth Climate Change Adaptation Strategy 2019-2024" which identify the desired outcomes anticipated through the effective implementation of the climate change adaptation strategy. These high-level goals have been integrated into the LCDP as objectives in order to mitigate and adapt to climate change.

In the LCDP, the Council recognises the range of new and developing technologies that can contribute to minimising GHG emissions, providing a secure and stable energy supply and securing a greater proportion of our energy from renewable sources. And also, the significant contribution that wind, solar and biomass energy can make as a clean sustainable solution to energy requirements and its vital role in helping achieve national targets in relation to fossil fuel reductions and consequently GHG emissions.

The LCDP includes the following policy objective:

**CA6** *To capitalise on the economic opportunities for County Louth that arise in association with the environmental and technological advances required to support the transition to a low carbon and climate resilient economy and in particular, opportunities arising from the implementation and translation of the European Green Deal and the post COVID-19 recovery plan Next Generation EU, to national policy.*

The LCDP also includes policy objectives to support the achievement of the targets set out in the Climate Action Plan 2019 and subsequent revisions of the CAP including the following which are relevant to the Proposed Development:

**IU 56** *To encourage the development of wind energy, in accordance with Government policy and guidance and the 'Wind Energy Development Guidelines' (2006) or any revisions thereof which may be issued during the lifetime of the Plan.*

**IU 60** *To support the development of off shore windfarm developments subject to normal planning considerations, including in particular the impact on areas of environmental or landscape sensitivity.*

**IU 64** *To support the development of solar energy infrastructure in the County including commercial scale ground mounted solar PV "Solar Farms" subject to environmental safeguards and the protection of natural and built heritage features, biodiversity and views and prospects.*

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- IU 49** *To support international, national and County initiatives for limiting and reducing emissions of greenhouse gases through energy efficiency and the development of renewable energy sources at suitable locations, utilising the natural resources of the County, in an environmentally acceptable manner subject to normal proper planning considerations including in particular the impact on areas of environmental or landscape sensitivity.*
- IU 50** *To co-operate with the appropriate authorities both north and south of the border in the provision of all-island renewable energy.*
- IU 51** *To support initiatives aimed at reducing the level of energy consumption within the County.*
- IU 70** *Facilitate and promote District Heating installation where practical through the County, while protecting residential amenity.*
- HOU 30** *To encourage building design and layout that maximises daylight and natural ventilation and incorporates energy efficiency and conservation measures that will improve the environmental performance of buildings in line with best practice.*
- IU 75** *To promote and facilitate the development of small-scale electricity generation installations and green technologies which do not negatively impact on environmental quality, landscape, wildlife and habitats and residential amenities.*
- IU 78** *To support and facilitate the reinforcement and development of enhanced electricity and gas supplies, and associated networks, to serve the existing and future needs of the County and Region. This will include the delivery of the necessary integration of transmission network requirements facilitating linkages of renewable energy proposals to the electricity and gas transmission grid, in a sustainable and timely manner, subject to appropriate environmental assessment and the planning process.*

## 12.4 Assessment Methodology

The Climate Impact Assessment including GHG assessment and Climate Change Resilience Assessment was carried out in accordance with the following relevant guidance documents:

- BS EN 15978:2011, "Sustainability of construction works, Assessment of environmental performance of buildings – Calculation method";
- European Commission (2013) "Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment";
- European Commission (2017) "Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report";
- Environmental Protection Agency (EPA) (2022) "Guidelines on the Information to be Contained in Environmental Impact Assessment Reports";
- Institute of Environmental Management and Assessment (IEMA) (2020), "Climate Change Resilience and Adaptation";
- IEMA (2022) "Guidance Note Assessing Greenhouse Gas Emissions and Evaluating their Significance" (Referred to as the IEMA (2022) Guidance);
- London Energy Transformation Initiative (LETI) (2020) "Embodied Carbon Primer" (Referred to as the LETI (2020) Guidance).
- Royal Institute of Chartered Surveyors (RICS) Professional Statement Version 1 (2017), "Whole life carbon assessment for the built environment" (Referred to as the RICS (2017) Guidance);
- Transport Infrastructure Ireland (TII) (2022), "Climate Guidance for National Roads, Light Rail, and Rural Cycleways (Offline & Greenways) - Overarching Technical Document, PE-ENV-01104" (Referred to as the TII (2022) Guidance);

- The Green Construction Board (2023) “PAS2080:2023 Carbon management in buildings and infrastructure”.

#### 12.4.1 GHG Assessment

The IEMA (2022) Guidance states that a GHG emissions assessment should incorporate the following steps into any climate assessment:

1. Set the scope and boundaries of the GHG assessment;
2. Develop the baseline;
3. Decide upon the emissions calculation methodologies;
4. Data collection;
5. Calculate/determine the GHG emissions inventory; and
6. Consider mitigation opportunities and repeat steps 4 & 5.

The following sections detail the specific methods utilised in order to complete the assessment in accordance with the IEMA (2022) Guidance.

#### Assessment Scenarios

Two scenarios are included in the GHG Emissions Assessments as follows in Table 12.4:

**Table 12.4:** Explanation of the Baseline (Business as Usual) and Proposed Development Assessment Scenarios Used for the GHG Emissions Assessments

|                                | Embodied Carbon Assessment                                                                                     | Operational Carbon Assessment                                                                                     |
|--------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>Business-As-Usual (BAU)</b> | An alternative basic project design for a development of this type with no carbon saving initiatives included. | The existing PPL Magnesia and Magnesium Hydroxide Production Facility at peak production (refer to Section 12.7). |
| <b>Proposed Development</b>    | Proposed Development with carbon saving initiatives included to reduce embodied carbon.                        | Proposed Development including energy technology to reduce operational carbon.                                    |

#### Study Area

The study area for the GHG assessment includes all GHGs generated from within the Proposed Development site arising during the construction, operation and decommissioning of the Proposed Development. It also includes emissions arising from offsite activities, which are directly related to the on-site activities associated with the Proposed Development, such as embodied carbon in materials for construction and operation, transport of materials and waste, treatment of waste disposal.

#### Sensitive Receptor

The global climate / global atmosphere is the receptor for the GHG assessment. The receptor has a high sensitivity, given the severe consequences of global climate change and the cumulative contributions of all GHG emission sources. To assess the magnitude of the effects of the Proposed Development on this receptor, estimated GHG emissions from the Proposed Development have been compared to Ireland’s relevant key performance targets, carbon budgets and sectoral emission ceilings as set out in the CAP24, where appropriate. This is in line with the IEMA (2022) and TII (2022) Guidance.



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## GHG Calculation Methodology

### Construction Phase - Embodied Carbon Assessment

AtkinsRéalis have completed an embodied carbon assessment for the Proposed Development in line with the *PAS2080 Carbon Reduction Strategy*<sup>144</sup> using the OneClickLCA Carbon tool. OneClickLCA is an industry wide recognised life cycle assessment software and is third-party verified for EN 15978, ISO 21931–1, ISO 21929–1 and for input data for ISO 14040/44 and EN 15804 standards.

The aim of the embodied carbon assessment was to estimate and reduce the embodied carbon effect of the Proposed Development. To achieve this, a number of low-carbon design measures and carbon reduction opportunities have been considered and incorporated into the design.

BS EN 15804:2019 specifies that all GHGs that cause damage to the atmosphere (including carbon dioxide, methane, nitrous oxide etc.) can be expressed as a carbon dioxide equivalent (CO<sub>2</sub>e) over 100 years. This environmental effect indicator is known as the Global Warming Potential (GWP). GWP are used to convert GHGs into a CO<sub>2</sub>e by multiplying emissions in mass terms by their respective GWP factors. In a whole life cycle assessment of a building, the CO<sub>2</sub>e include all the emission sources associated with the construction and the use of the building over its life (refer to Figure 12.2).

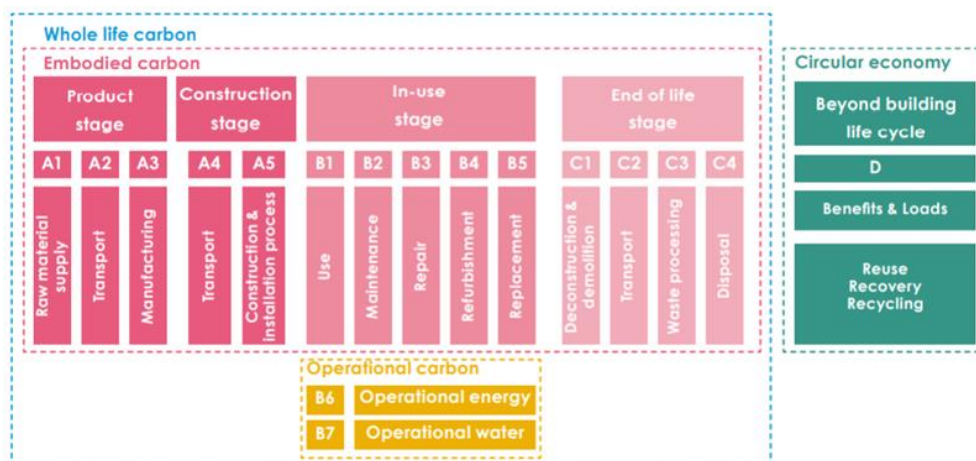


**Figure 12.2:** System Boundary – Display of Modular Information for the Different Stages of the Building Assessment: (EN 15978:2011) (LETI Embodied Carbon Primer)

Emissions, arising from both upfront embodied carbon and operational carbon generated throughout the developments design life, are attributed to four “Lifecycle Stages” as specified in EN 15978:2011. These are as follows:

#### 1. Construction Process: A1-5 (Upfront carbon emissions)

##### a. Product Manufacture: A1-3

Carbon emissions generated from extracting the raw materials from the ground, their transport to a point of manufacture and then the primary energy used (and the associated carbon effects that arise) from transforming the raw materials into construction products.

##### b. Construction: A4-5

Carbon emissions generated from transporting the construction products to site, and their subsequent processing and assembly into the building.

#### 2. In Use: B1-7

This covers a wide range of sources from the carbon emissions associated with the maintenance, repair, and replacement over a 60-year assessment period.

<sup>144</sup> The Green Construction Board (2023) *PAS2080 Carbon management in buildings and infrastructure*.

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The embodied carbon

It is noted the operation of the building (heating, domestic hot water, cooling, ventilation, lighting, auxiliary energy used for pumps, control, and automation) normally reported under modules B6 and B7 are not included in the embodied carbon assessment. This is assessed separately under Operational Carbon within this Chapter.

### 3. End of Life: C1-4

The eventual deconstruction and disposal of the existing building at the end of its life takes account of the on-site activities of the deconstruction contractors.

### 4. Beyond system boundary: D

Any carbon savings that would be a benefit as a result to reusing, recovering and recycling materials.

The embodied carbon assessment completed by AtkinsRéalis follows the classification set out within the BS EN 15978: 2011 (*Sustainability of Construction Works – Assessment of Environmental Performance of Buildings – Calculation Method*) for the lifecycle modules and the building elements classification provided by the RICS (2017) Guidance. The assessment includes all the elements that were appropriate, in line with the recommended inclusions as per the LETI (2020) Guidance. A list of assumptions and the excluded elements from the assessment is outlined in Section 12.5 and Tables 12.5 and Table 12.6 of this Chapter.

The embodied carbon assessment for the Proposed Development was categorised into four groups as follows:

- The EC
- The DC
- The Bio-Solar Façade (DC)
- The External Works (Landscaping/Campus)

Individual embodied carbon models were completed for each group.

Table 12.5 outlines the Life Cycle modules included, and Table 12.6 outlines the building elements that were part of the assessment.

**Table 12.5:** Scope of the Embodied Carbon Assessment Based on the Life Cycle Modules Outlined in BS EN 15978: 2011 (provided by AtkinsRéalis)

| Lifecycle Stage                                         | EN 15978 Modules                       | In Scope |
|---------------------------------------------------------|----------------------------------------|----------|
| Product Stage                                           | A1 Raw material supply                 | ✓        |
|                                                         | A2 Transport                           |          |
|                                                         | A3 Manufacturing                       |          |
| Construction Stage                                      | A4 Transport                           | ✓        |
|                                                         | A5 Construction Energy                 | ✓        |
|                                                         | A5 Construction Waste                  | ✓        |
| In-Use Stage                                            | B1 Use                                 | ✓        |
|                                                         | B2 Maintenance                         | ✓        |
|                                                         | B3 Repair                              | ✓        |
|                                                         | B4 Replacement                         | ✓        |
|                                                         | B5 Refurbishment                       | ✓        |
| Operational Carbon                                      | B6 Operational Energy use              | ✗        |
|                                                         | B7 Operational Water Use               | ✗        |
| End of Life                                             | C1 Deconstruction / demolition         | ✓        |
|                                                         | C2 Transport                           |          |
|                                                         | C3 Waste processing                    |          |
|                                                         | C4 Disposal                            |          |
| Supplementary Information beyond the Building Lifecycle | D Reuse, Recovery, Recycling Potential | ✗        |

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**Table 12.6:** Building Categories Included In the Assessment (provided by AtkinsRéalis)

| Code | Building Category                          | Building element                                                                      | In Scope |
|------|--------------------------------------------|---------------------------------------------------------------------------------------|----------|
|      | Demolition                                 | 0.1 Toxic/Hazardous/Contaminated Material treatment                                   | x        |
|      |                                            | 0.2 Major Demolition Works                                                            |          |
| 0    | Facilitating Works                         | 0.3 and 0.5 Temporary/Enabling Works                                                  | x        |
|      |                                            | 0.4 Specialist groundworks                                                            |          |
| 1    | Substructure                               | 1.1 Substructure                                                                      | ✓        |
|      |                                            | 2.1 Frame                                                                             |          |
|      | Superstructure                             | 2.2 Upper floors incl. balconies                                                      |          |
|      |                                            | 2.3 Roof                                                                              | ✓        |
|      |                                            | 2.4 Stairs and ramps                                                                  |          |
| 2    | Superstructure – façade                    | 2.5 External Walls                                                                    | ✓        |
|      |                                            | 2.6 Windows and External Doors                                                        |          |
|      | Superstructure- Internal Layout            | 2.7 Internal Walls and Partitions                                                     | ✓        |
|      |                                            | 2.8 Internal Doors                                                                    |          |
| 3    | Finishes                                   | 3.1 Wall finishes                                                                     | ✓        |
|      |                                            | 3.2 Floor finishes                                                                    |          |
|      |                                            | 3.3 Ceiling finishes                                                                  |          |
| 4    | Fittings, furnishings & equipment (FF&E)*  | 4.1 Fittings, Furnishings & Equipment incl. Building-related and non-building-related | x        |
| 5    | Building services/MEP                      | 5.1–5.14 Services incl. building-related and non-building-related                     | ✓        |
| 6    | Prefabricated Buildings and Building Units | 6.1 Prefabricated Buildings and Building Units                                        | x        |
| 7    | Work to Existing Building                  | 7.1 Minor Demolition and Alteration Works                                             | x        |
|      |                                            | 8.1 Site preparation works.                                                           |          |
| 8    | External works                             | 8.2 Roads, Paths, Paving and Surfacing                                                | ✓        |
|      |                                            | 8.3 Soft landscaping, Planting, and Irrigation Systems                                |          |
|      |                                            | 8.4 Fencing, Railings and Walls                                                       |          |
|      |                                            | 8.5 External fixtures                                                                 |          |
|      |                                            | 8.6 External drainage                                                                 |          |
|      |                                            | 8.7 External Services                                                                 |          |
|      |                                            | 8.8 Minor Building Works and Ancillary Buildings                                      |          |

*\*Temporary works, including data equipment, are not included in this assessment. Additionally, there is insufficient information available to accurately estimate the carbon emissions associated with them.*

*Note: In line with the RICS Guidance, Temporary Works are not anticipated to be included as part of the embodied carbon assessment at this stage. As the design develops towards the construction stage, there may be additional benefit identified in measuring this element, in which case the scope and granularity of the carbon assessment will be reviewed.*

As part of the design progression of the Proposed Development, several workshops were conducted with the design teams to explore opportunities for integrating broader sustainability aspects into the design, including avenues for carbon reduction. A minimum carbon reduction target of 10% for upfront carbon emissions from the BAU scenario was set for the project based on the CAP24 key target to decrease embodied carbon in construction materials produced and used in Ireland through product substitution by 10% before 2025. Upfront carbon emissions are GHG emissions associated with materials and construction processes up to practical completion (modules A0–A5 in Figure 12.2) and are seen to make up the majority of the total embodied carbon in the study.

The carbon reduction strategies implemented in the Proposed Development primarily relate to material specifications and have been integrated into the design. The reduction strategies predominantly target structural elements which were demonstrated to be the hot spots for carbon emissions in the study. Details of the carbon emissions reduction enhancements identified include:

- **Concrete Specification:** The Business as Usual (BAU) carbon model assumes a Portland cement concrete mix (CEM I) with no cement replacement content – in line with market average mixes in Ireland. The Proposed Development will specify a concrete mixture with 10% Cement replacement for foundations and beams (CEMII/A-V) and 60% Cement replacement for structural elements (CEMIII/A), equivalent to a saving of 23 kgCO<sub>2</sub>e per m<sup>3</sup> of concrete for foundations and beams, and 137 kgCO<sub>2</sub>e per m<sup>3</sup> for concrete slabs and frame elements.
- **Steel Rebar Specification:** Currently, the BAU carbon model assumes steel rebar that has not been recycled. The Proposed Development will specify the use of rebar which is made of 95% recycled steel, or equivalent.
- **Design Efficiency:** As part of the effort to reduce carbon emissions by minimising materials usage, one enhancement proposal included in the Proposed Development involves improving design efficiency to decrease steel tonnage by 10%. This initiative is expected to yield significant carbon reduction, considering that each tonne of steel typically accounts for 2.5 tCO<sub>2</sub>

- PV Panels Specification: Currently, the BAU carbon model assumes PV panels which are procured from China with 77% recycled content. The Proposed Development will specify the use of PV panels with 89% recycled content (assumed to be procured from Europe).

#### Operational Phase - Operational Carbon

The nature and magnitude of GHG emissions associated with the operational phase of the Proposed Development are presented within this Chapter based on the *Energy and Emissions Modelling Report* which accompanies this planning application. The modelling has been completed by Gyrogy in co-operation with Baringa (leading energy consultancy experts in energy system analysis) as described in Section 2 of the Energy and Emissions Modelling Report.

Energy models of the Integrated Single Electricity Market (ISEM) for Ireland and Northern Ireland were prepared to simulate the performance of the energy infrastructure and energy technology solutions included in the Proposed Development. The energy modelling was completed with the use of PLEXOS, a modelling software designed for intricate energy system simulations.

To enable this modelling Gyrogy have provided details of the equipment, its capabilities, how it will be connected and controlled as a system and the logic and strategy of how it is intended the system will operate. Baringa's simulations of the performance of Gyrogy's technology on the Irish electricity system has been ongoing for 4 years, helping to optimise the assets and fuel/energy mix that can make the biggest impact on decarbonisation. The model is updated periodically to reflect the changes (retirements and new entrants) on the Irish grid as well as the evolving market conditions for gas, wholesale electricity, carbon pricing etc. The model represents European markets and actual dispatch with an hourly resolution out to the year 2060.

To address the specificities of emissions-based dispatch and operational scheduling for the proposed on-site energy technologies, the model was augmented with a custom simulation for the Proposed Development. The energy modelling of the proposed development technology solutions provides an understanding of how it will be utilised in order to identify the ideal running scenarios for the various energy assets that make up the system at the Proposed Development.

#### Decommissioning Phase Carbon

Considering the design life of the Proposed Development (assumed to be at least 60 years), future technological advancement, accelerated future carbon reduction and increase in uptake of circular economy principles in Ireland, it is not possible to predict when the decommissioning of the Proposed Development would occur and what carbon emissions this would generate.

In addition, emissions from the decommissioning stage cannot be accurately quantified at this stage as a result of future uncertainty in methods of construction, deconstruction and decarbonisation across the industry.

As the required data to allow a quantitative GHG emissions estimate of the decommissioning phase is not available at this stage, the GHG emissions are qualitatively assessed.

A qualitative description of GHG emissions expected from the decommissioning activities when the Proposed Development has reached the end of life has been included. This approach is in line with IEMA (2022) Guidance which states 'a high-level or qualitative GHG assessment for certain project elements or activities can be carried out as long as it is justified'.

#### **GHG Significance Criteria**

The IEMA (2022) *Guidance on Assessing Greenhouse Gas Emissions and Evaluating their Significance* has been used for the GHG significance criteria in the climate impact assessment.

When assessing significance, the 2010 *IEMA Principles Series on Climate Change Mitigation & EIA* (IEMA, 2010) describes three overarching principles which are particularly relevant in considering the aspect of significance:

- GHG emissions from all projects will contribute to climate change, the largest interrelated cumulative environmental effect.

- The consequences of a changing climate have the potential to lead to significant environmental effects on all topics in the Environmental Impact Assessment (EIA) Directive (e.g. human health, biodiversity, water, land use, air quality).
- GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit; as such any GHG emissions or reductions from a project might be considered to be significant.

The IEMA (2022) Guidance builds on those principles with the following three points:

- When evaluating significance, all new GHG emissions contribute to a negative environmental effect; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should therefore be based on its net effect over its life time, which may be positive, negative or negligible.
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages.
- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.

The IEMA (2022) Guidance states that "the crux of significance therefore is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050".

In accordance with the IEMA (2022) Guidance and the TII (2022) Guidance, the Climate Practitioner must assess:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050.
- The level of mitigation taking place.

Table 12.7 illustrates the significance matrix included in the TII (2022) Guidance that has been based on the significance criteria set out in the IEMA (2022) Guidance and which is also used in this assessment.



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**Table 12.7:** GHG Impact Assessment Significance Criteria, (Source: Table 6.7 of Transport Infrastructure Ireland (TII) (2022), *Climate Guidance for National Roads, Light Rail, and Rural Cycleways*)

| Effects                     | Significance Level | Description                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Significant adverse:</b> | Major adverse      | <ul style="list-style-type: none"> <li>- The project's GHG impacts are not mitigated.</li> <li>- The project has not complied with do-minimum standards set through regulation, nor provide reductions required by local or national policies; and</li> <li>- No meaningful absolute contribution to Ireland's trajectory towards net zero.</li> </ul>                    |
|                             | Moderate adverse   | <ul style="list-style-type: none"> <li>- The project's GHG impacts are partially mitigated.</li> <li>- The project has partially complied with do-minimum standards set through regulation, and have not fully complied with local or national policies; and</li> <li>- Falls short of full contribution to Ireland's trajectory towards net zero.</li> </ul>             |
| <b>Not Significant:</b>     | Minor adverse      | <ul style="list-style-type: none"> <li>- The project's GHG impacts are mitigated through 'good practice' measures.</li> <li>- The project has complied with existing and emerging policy requirements; and</li> <li>- Fully in line with measures necessary to achieve Ireland's trajectory towards net zero.</li> </ul>                                                  |
|                             | Negligible         | <ul style="list-style-type: none"> <li>- The project's GHG impacts are mitigated beyond design standards.</li> <li>- The project has gone well beyond existing and emerging policy requirements; and</li> <li>- Well 'ahead of the curve' for Ireland's trajectory towards net zero and has minimal residual emissions.</li> </ul>                                        |
| <b>Beneficial</b>           | Beneficial         | <ul style="list-style-type: none"> <li>- A project's net GHG impacts are below zero and it causes a reduction in atmospheric GHG concentration.</li> <li>- The project has gone well beyond existing and emerging policy requirements; and</li> <li>- Well 'ahead of the curve' for Ireland's trajectory towards net zero, provides a positive climate impact.</li> </ul> |

The IEMA (2022) Guidance also states "*it is down to the practitioner's professional judgement on how best to contextualise a project's GHG impact.*" An example of good practice approach outlined in the guidance is comparison of the Proposed Development's carbon footprint against various sectoral, local or national carbon budgets.

For the purposes of this assessment, the Carbon Budgets and Sectoral Emission Ceilings set out for Ireland in the CAP24 under the Low Carbon Development (Amendment) Act 2021 (refer to Section 12.6.1 of this Chapter) have been used to provide context for the assessment where appropriate.

#### 12.4.2 Climate Change Resilience Assessment Risk Assessment Method

The aim of the Climate Change Resilience Assessment is to identify and minimise the vulnerability of the Proposed Development to climate change.

The assessment is based on the approach set out in the guidance documents by the European Commission (2013) "Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment" and IEMA (2020) "Climate Change Resilience and Adaptation".

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The approach to the assessment is based on the following steps:

- Identify potential climate change risk to a project;
- Assess these risks (potentially prioritising to identify the most severe); and
- Formulate mitigation actions to reduce the impact of the identified risks.

The Met Éireann “*New Climate Projections 2020*”<sup>145</sup> and the EPA’s Climate Ireland website<sup>146</sup> have been used as the most up to date information to define the potential climate change hazards and disruptive weather conditions for the Proposed Development. The assessment assesses the resilience of the Proposed Development against both gradual climate change and the risks associated with an increased frequency of severe weather events as per the EPA climate change projections. The scope of the assessment includes the following climate hazards:

- Extreme Heat/Increasing Temperatures including increase in Annual Temperature;
- Extreme Cold/Low Temperatures;
- Flooding/Increases in Rainfall;
- Decreases in Rainfall/Drought;
- Extreme Wind / Increase in Storm Intensity and Frequency
- Sea Level Increases;
- Biodiversity Loss.

The Climate Change Resilience Assessment completed in this Chapter takes cognisance of the climate adaption and mitigation measures included in the NAF and the LCDP.

A Climate Change Resilience Risk Assessment has been completed to identify potential climate change impact hazards which may affect the operational phase of the Proposed Development, and considers their potential consequences and likelihood of occurrence. Appropriate control/mitigation measures have been identified and incorporated into the design of the Proposed Development to reduce these hazards.

Potential climate change impact risks associated with climate hazards, likelihood of occurrence and potential consequence of each impact is assessed using the risk framework provided in the *TII Climate Guidance for National Roads, Light Rail, and Rural Cycleways (2022)* which is based on the framework detailed in the *European Union Technical Guidance on climate proofing (2021)*. The likelihood analysis, consequence analysis, mitigation measures that are included in the Proposed Development where relevant and risk matrix are provided in Appendix C of this EIAR.

The Gross risk associated with the climate change hazards and impacts identified is determined by:

*Likelihood of climate hazard occurring × consequence to receptor if climate hazard occurs*

The identification of likely significant effects on receptors has been undertaken using professional judgement by combining the measure of likelihood with the predicted consequence of impact in a risk matrix, as shown in Table C.4 of Appendix C.

Proposed and existing adaptation / mitigation measures have been included in Table C.4 to reduce the significant effects/severity of the risks where relevant.

<sup>145</sup> Met Éireann (2020) “*New Climate Projections 2020*” <https://www.met.ie/epa-climate-projections-2020> , accessed 05 May 2024

<sup>146</sup> Climate Ireland, <https://www.climateireland.ie/#!/tools/sectors/coastalAreas> , accessed 02 May 2024

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## Study Area

The study area for the climate change resilience assessment is the site of the Proposed Development. It covers all assets and infrastructure that constitute the Proposed Development, during construction, operation and decommissioning.

## Sensitive Receptors

Sensitive receptors for the construction phase of the Proposed Development include the construction workforce, equipment, vehicles, materials and workplace which may be vulnerable to a range of climate risks.

The sensitive receptor for the operation phase climate resilience assessment is the Proposed Development during its lifetime (assumed to be 60 years). The buildings, spaces, infrastructure, services, biodiversity and operational workers are considered receptors.

### 12.4.3 Potential Cumulative Effects

The (IEMA, 2010) Guidance states that GHG emissions from all projects will contribute to climate change, the largest interrelated cumulative environmental effect.

The IEMA (2022) Guidance explains that when considering the cumulative assessment: *'All global cumulative GHG sources are relevant to the effect on climate change, and this should be taken into account in defining the receptor (the atmospheric concentration of GHGs) as being of 'high' sensitivity to further emissions.'*

*Effects of GHG emissions from specific cumulative projects therefore in general should not be individually assessed, as there is no basis for selecting any particular (or more than one) cumulative project that has GHG emissions for assessment over any other.'*

On this basis, it is not appropriate to limit a cumulative impact assessment to local developments. Instead, the GHG assessment addresses the cumulative effect at a national level by considering the Proposed Development in the context of Ireland's national GHG emissions and national carbon reduction targets for the construction and operational phases of the project. This contextualisation of GHG emissions by its nature incorporates the cumulative contributions of other GHG sources which make up that context.

In addition, the IEMA (2022) Guidance states that *'all new GHG emissions contribute to a negative environmental effect; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should therefore be based on its net effect over its life time, which may be positive, negative or negligible.'* The cumulative effects of the cessation of the existing operations at the PPL site are assessed under the *'Potential Operational Effects'*. This section provides a contrast between the Proposed Development operational carbon effects and that of the *'Do Nothing Scenario'* where the existing PPL site would return to peak production of magnesia products at the facility should the Proposed Development not go ahead.

As described in *Chapter 2 Description of Proposed Development* of this EIAR, the Proposed Development to which this planning application relates is the first stage of CORE.

## Potential Future Phases of CORE

Potential future phases of CORE will be subject to separate planning applications and environmental impact assessment. Future phases of the development may require additional mitigation measures to ensure the mitigation of potential effects on Climate. These measures will be identified and detailed as part of the EIAR for any additional respective phases of the development to ensure the potential future phases do not have any significant adverse effects with respect to Climate.

### 12.4.4 Potential Indirect Effects

Article 3(1) of the EIA Directive 2011/92/EU as revised by Directive 2014/52/EU provides that the EIA shall identify, describe and assess in an appropriate manner and in the light of each individual

case, the direct and indirect significant effects of a project on the following factors... An 'effect' is something that is caused or likely to be caused by the Proposed Development if permission is granted and the development is carried out. It is acknowledged that such indirect effects can arise 'off-site' and even at some remove from the Proposed Development for which permission is sought. Nonetheless, EIA is not an open-ended process and therefore, there are some parameters around the assessment of indirect effects of a proposed project, which have been discussed in several significant cases including those discussed here. In summary, it is considered that an assessment of the effects of the renewable energy projects that would be the subject of the CPPA is beyond the scope of the EIA to be carried out for this Proposed Development.

The most recent decision of the UK Supreme Court in *Finch* [2024] UKSC 20, is distinguishable from the circumstances of this case. In that case, the Proposed Development for which consent was sought, and in respect of which an EIA was required, was a proposed oil well to extract oil from a site in England. The GHG emissions chapter of the EIAR for that project scoped out any emissions that would arise as a consequence of burning of that oil for energy or other purposes. The Supreme Court found that this was not consistent with Article 3(1) of the EIA Directive or the corresponding provisions of the EIA Regulations in the UK. The Supreme Court found that the emissions from the burning of the oil extracted from the Proposed Development constituted the indirect effects of that Proposed Development, for several reasons:

- The Court found a direct causal link between the extraction of the oil and its inevitable burning – notwithstanding any intervening steps such as processing at a refinery, there was no doubt whatsoever that the burning of the oil would occur, and that emissions would arise.
- The Court also found that there was broad agreement that the emissions from burning of the oil were calculable based on established methodology, and that a precise emissions figure could be derived from the volume of oil extracted that would be burned.
- Given the nature of GHG emissions, it was irrelevant whether the oil was burned in the UK or in another jurisdiction, as the emissions to atmosphere would be the same.
- It was also irrelevant to the question of whether EIA is required that the developer of the oil well would have no control over or ability to mitigate those emissions at the point at which they are burned, or that there are no mitigation measures that can be applied at the point of extraction.
- The Court took into account that, by scoping out these emissions the project developer had prepared an EIAR which concluded that GHG emissions from the Proposed Development would be insignificant, whereas had those emissions been scoped in the conclusion would have been that such emissions were very significant, and therefore this was a significant effect of the Proposed Development that ought to have been considered as part of the EIA process for the Proposed Development.

In reaching its conclusions, the UK Supreme Court had regard to several key judgments including a judgment of the Irish Supreme Court in *An Taisce* [2022] IESC 8. Mr Justice Hogan had found that the indirect effects of dairy farming did not need to be assessed as part of the EIA of a proposed cheese factory that would be supplied by a large number of dairy farms across Ireland, because the connection between the emissions from those farms and the proposed cheese factory development were too remote and uncertain. This decision was informed by the fact that the proposal was that the milk supply would come from existing sources and would therefore not cause *additional* milk production, accordingly whilst there was a large gross GHG emissions calculation done, the conclusion was that the net GHG emissions would not be significant. The Supreme Court accepted the argument that the diversion of 4.5% of the national milk production towards this one factory could result in a driving upwards of milk production to meet other demands, with corresponding risk of increased emissions to air and water, but found that there was no clear evidence of such increase or the likely effects of same.

Hogan J nonetheless observed that there may be "special and unusual cases where the causal connection between certain off-site activities and the operation and construction of the project itself is demonstrably strong and unbreakable" and the UK Supreme Court in *Finch* relied on this exception in support of its position that there as such a demonstrably strong and unbreakable

connection between the proposed oil well and the burning of the oil to be extracted from that well if permission is granted.

There is no such ‘demonstrably strong and unbreakable’ connection between the Proposed Development, and any renewable energy projects that would be the subject of the CPPA is beyond the scope of the EIA to be carried out for this Proposed Development. The “but for” test is not satisfied, as it could not be argued that “but for” the Proposed Development, such renewable energy projects would not come into existence by some other means, and there are no identifiable environmental effects or emissions that are likely to be caused by such projects that would not be caused “but for” the Proposed Development.

In *Finch* the UK Supreme Court identified the need for an EIA to be based on evidence of significant effects, and that such evidence is necessary to underpin the “reasoned conclusion” that must be reached by the competent authority in determining whether to grant consent for the proposed project. An EIA cannot be based on speculation or conjecture, according to the Court, and notably the Court in *Finch* confined its judgment on the requirement to assess the indirect effects of burning the oil to those effects that are “likely” and, based on evidence, capable of being calculated and assessed.

There are no identifiable effects that can be said to be “likely” to arise from the development of renewable energy projects, as such effects (if any) would depend on the nature, scale and location of any such projects, and the effectiveness of the environmental controls and mitigations that would be put in place to avoid and minimise any such effects. The likely significant effects in *Finch* and *An Taisce* were much more clearly identifiable and calculable, and indeed were calculated insofar as they related to GHG emissions. There is no such established methodology for assessing the effects of a renewable energy project, the nature, scale and location of which have not been identified.

Finally, the Irish High Court in *Coyne* [2023] IEHC 412 acknowledged in paragraph 138 and footnote 265, stating that it is entirely understandable and perhaps even inevitable that a CPPA would not be in place prior to a grant of permission for the proposed DC in that case. The Court further noted that it was entirely appropriate for the Board to conduct its climate impact assessment of the Proposed Development based on the national fuel mix, rather than on a vague ambition or intention of the developer who had stated in correspondence to the Board that it was ‘actively considering options’ to source renewable energy for the DC.

In the present application, the developer is proposing that a condition be imposed which would ensure that a CPPA is in place prior to the commencement of operations. Compliance with such condition could delay the commencement of operations, and it is not inevitable (per *Finch*) that certain environmental effects would be likely to occur as a consequence of any renewable energy project being developed for the purposes of such CPPA, nor are any such effects capable of being calculated in accordance with any accepted methodology. There is no “demonstrably strong and unbreakable” connection between the Proposed Development and any such renewable energy project (per *An Taisce*) such as would necessitate an assessment of the indirect effects of such renewable energy project on the environment as part of the EIA for the Proposed Development. Accordingly, any such effects (the existence of which is not apparent) are scoped out of this EIAR.

## 12.5 Limitations and Assumptions

### 12.5.1 GHG Assessment

#### Embodied Carbon Assessment

The embodied carbon assessment has been completed by AtkinsRéalis based on information provided by the design team in the form of: design plans and drawings material take-offs; information provided by the design team; and bill of quantities provided by the project cost consultant.

Where information was not available assumptions were made in line with industry averages to allow for an initial baseline setting. An additional safety factor of 10% was included to account for



smaller elements of the Proposed Development that were not covered by the assessment. All significant aspects of the Proposed Development are considered to have been captured.

A list of specific material assumptions made in the embodied carbon models and a full breakdown of the materials and their associated quantities included in the assessment as provided by AtkinsRéalis is included in Appendix D of this EIAR.

The embodied carbon assessment completed by AtkinsRéalis includes the following general assumptions:

#### Building Area

The Gross Internal Area (GIA) used in the embodied carbon models was provided by the design team as:

- EC: 6,755 m<sup>2</sup>
- DC: 26,496 m<sup>2</sup>

#### Building Life Cycle

The project life expectancy has been designed for 60 years, in line with the RICS (2017) Guidance recommended Reference Study Period and actual project aspirations.

#### Transport Distances

Due to unavailability of this data at this stage of the project, the transport distances adopted were in line with the RICS Professional Statement guidance:

- Locally manufactured = 50 km
- Nationally manufactured = 300 km
- European Manufactured = 1,500 km
- Globally manufactured = 200 km by road + 10,000 km by sea

#### On-Site Construction Impacts

On-site construction impacts (Module A5a) were assumed in line with the RICS (2017) Guidance, equal to 1,400 kgCO<sub>2</sub>e / €100k of project value. The value for the Proposed Development Construction works was equal to:

- DC: €73 m
- EC: €82 m

#### Construction Waste factors

Waste factors (Module A5w) were assumed in line with industry market averages, recommended by the carbon software OneClickLCA.

#### Contingency Factors

Due to the current design stage of the Proposed Development, the cost plan was not sufficiently detailed to carry out a coverage exercise. Therefore, a contingency factor of 10% has been incorporated into the carbon assessment estimate to accommodate elements not included in the assessment and to address uncertainties in the carbon model. This aligns with RICS (2017) Guidance and accounts for uncertainties related to Material Variability, Data Availability, Design Changes, Technological Advancements, and Regulatory Changes that may affect the embodied carbon assessment.

#### Module B emissions

Due to unavailability of specific information regarding replacement cycles, Module B emissions were kept at default values provided by the carbon tool OneClickLCA. These values should be updated to more accurate values once more information is available regarding maintenance and refurbishment cycles.

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### Refurbishment and Materials Service Life (Module B4)

The materials' service life was kept to the default figures suggested by the OneClickLCA carbon tool, which are based on general RICS (2017) Guidance and materials data. These assumptions will need to be reviewed for greater accuracy that reflects the actual replacement cycles once the procurement route for materials is established, as they might influence the carbon emissions included in Module B.

### End of Life Scenarios (Module C1)

End-of-life emissions associated with deconstruction and decommissioning were estimated using an average carbon factor of 3.4 kgCO<sub>2</sub>e / m<sup>2</sup> of built area.

### Exclusions

The carbon assessments undertaken for the Proposed Development exclude a number of elements, due to the unavailability of accurate information or data at the current stage of the project design. Some elements will be further refined at a more detailed design stage, when contractors and tenant are selected for the Proposed Development. These will need to be included at later stages when the design progresses and more information becomes available. The excluded items are:

- Mechanical, Electrical, and Plumbing (MEP) Refrigerants emissions (Module B1), a key aspect of DCs with a primary cooling load has been excluded due to unavailability of information at this stage. These should be added to the assessment once this information is available. However, it is noted that the design has specified that R290 will be used as the refrigerant, given its lower GWP and greater environmental friendliness compared to other refrigerant options.
- Data Equipment and servers.
- Demolition impacts. This would typically require input from a contractor regarding demolition energy usage, which is not available at this stage.
- Quantum of retained structures.

## **Operational Carbon Assessment**

### Energy

Detailed assumptions relevant to the Baringa energy modelling presented in this Chapter are included in the Emissions and Energy Modelling Report which accompanies this planning application.

Pending planning permission, the Proposed Development is expected to begin operations in 2028. For the purposes of the impact assessment, emissions in the year 2030 are focused on as this is the last year of Ireland's current carbon budgets (set out in Section 12.3 of this Chapter) which are used to contextualise the operational emissions of the Proposed Development.

### Water

Due to the nature and design of the Proposed Development consumption of mains water supply will be minimal. This will be for sanitary use for the approx. 50 no. operational staff at the facility.

Some of the freshwater sourced from the EPA registered Littlegrange/Mell quarry abstraction regime at the site will be used for industrial processes at the Proposed Development as follows:

DC and EC Cooling System water: there will be no requirement to use the public water supply for the cooling system employed at the DC and EC. For most of the year the conventional cooling tower system to be used will operate as a dry cooler therefore there are no freshwater requirements. Freshwater will be required for the cooling system only during peak summer temperatures when evaporative cooling is required, with up to 240 m<sup>3</sup>/day of freshwater consumed. This freshwater will be sourced from the EPA registered Littlegrange/Mell quarry abstraction regime and will be within the limits of the existing registered abstraction volumes. The water used will be released by evaporation from the cooling towers.

Firewater: It is proposed to utilise the freshwater from the Mell quarry as a source for firewater supply. The supply from the quarry will go to 270 m<sup>3</sup> static firefighting storage tank for storage, ensuring one hour of firefighting at 4,500 l/min. The freshwater supply, once it has filled the static tank, will overflow and be diverted to the existing outfall discharge to sea to the east of the site.

As the water to be used for industrial processes is to be sourced from the existing freshwater sourced from the EPA registered Littlegrange/Mell quarry abstraction regime, there is no additional carbon emissions associated with the use of this water.

There are no GHG emissions generated from the production or treatment of this freshwater required before using in the cooling tower system/firefighting tank. The electricity (and associated GHG emissions) required for the water abstraction system and for the cooling tower system is already accounted for in the operational energy carbon assessment above. In addition, there is no water discharged from the closed towers system which would require treatment as all water used in the system is evaporated. The cooling tower does not have a blowdown requirement, but will be cleaned once a year during the cooling tower's 'dry' season. This is just to descale and clean where necessary.

Based on the above it is considered that GHG emissions associated with water consumption during the operational phase of the development will be less than 1 % of total operational carbon emissions and are therefore excluded from further assessment in accordance with the IEMA (2022) Guidance.

### **Decommissioning Carbon Assessment**

As described in Section 12.4.1 of this Chapter, a qualitative description of GHG emissions expected from the decommissioning activities when the Proposed Development has reached the end of life has been included. This approach is in line with IEMA (2022) Guidance.

#### **12.5.2 Climate Change Resilience Assessment**

There are a range of assumptions and limitations associated with projected climate change. There are inherent uncertainties within the predicted climate change patterns for Ireland included in the climate change resilience assessment.

#### **12.5.3 General Assumptions, Inclusions and Exclusions**

This section lists general assumptions, inclusions and exclusions relating to the GHG assessment and the climate change resilience assessment. Where relevant, specific assumptions, inclusions and exclusions are stated throughout this report.

- The construction phase of the Proposed Development is described within *Chapter 2 Description of Proposed Development* of this EIAR.
- The Proposed Development operations are described within *Chapter 2 Description of Proposed Development* of this EIAR
- The construction phase including demolition will take approx. 38 months in total. The service life of the Proposed Development is 60 years.

### **12.6 Baseline Environment**

#### **12.6.1 GHG Emissions in Ireland**

The EPA produces national GHG emission projections on an annual basis

The latest EPA projections<sup>147</sup> show that Ireland is currently not on track to meet its Carbon Budgets:

- Carbon Budget for 2021 – 2025 (295 MtCO<sub>2</sub>) is projected to be exceeded by 26 MtCO<sub>2</sub> with existing measures in place.

<sup>147</sup> EPA (May 2024) "Ireland's Greenhouse Gas Emissions Projections 2023-2050", <https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/EPA-GHG-Projections-Report-2022-2050-May24--v2.pdf>, accessed 07 June 2024.

- Carbon Budget for 2026 – 2030 (200 MtCO<sub>2</sub>) is projected to be exceeded by 109 MtCO<sub>2</sub> with existing measures in place.
- Carbon Budget for 2031-2035 (151 MtCO<sub>2</sub> - provisional) is projected to be exceeded by 143 MtCO<sub>2</sub> with existing measures in place.

Similarly for the Sectoral Emission Ceilings, the only ceilings projected to be achieved in the first budget period (2021-25) are the Buildings (Commercial and Public) sector, and the sector Other<sup>148</sup>. For the second budget period (2026-30), compliance is also being projected only for these sectors.

The CAP24 also includes an update on the progress to date in achieving sectoral emissions ceilings for the Industry and Electricity Sector.

It states that the EPA's National Inventory Report for 2022 illustrates that 45% of the Industry Sector carbon budget for 2021 to 2025 has been used in the first two years. Emissions in 2022 were 6.6 MtCO<sub>2</sub>, down from 7.1 MtCO<sub>2</sub> in 2021. The EPA projections currently predict an overshoot of the carbon budget targets for the industry sector by approx. 4.4 MtCO<sub>2</sub> in the period 2021 to 2025 and approx. 9.5 MtCO<sub>2</sub> in the period 2026 to 2030.

Similarly for the Electricity Sector, 49% of the carbon budget for 2021 to 2025 has been used in the first two years, with emissions of 9.98 MtCO<sub>2</sub> in 2021 and 9.77 MtCO<sub>2</sub> in 2022. The EPA projections currently show that the electricity Sector emissions are not currently aligned to pathways and targets set out in the CAP24 with an overshoot of approx. 5.2 MtCO<sub>2</sub> predicted in the period 2021 to 2025 and approx. 8.2 MtCO<sub>2</sub> in the period 2026 to 2030.

In the Sustainable Energy Authority of Ireland's (SEAI) report *National Energy Projections 2023*, the key conclusions for the electricity sector are as follows:

- Significant progress has been made to date when it comes to decarbonising our electricity system, with the carbon intensity of electricity from the grid decreasing by over 50% between 2005 and 2020.
- Variable renewables are expected to be the largest input to electricity generation in Ireland by 2030, with a sharp increase anticipated later this decade due to assumed connection of large offshore wind projects.
- The deployment of renewables needs to outpace the growth in energy demand for it to deliver the absolute reductions in GHG emissions required. Therefore, the timing of the delivery of the renewable energy generation relative to the scale and pace of growth in electricity demand is a critical factor.

CAP24 states the following in relation to the scale of the challenge for Ireland: 'Transformational policies, measures, and actions, along with societal change, are required to meet the electricity sector's sectoral emissions ceiling. During the second carbon budget period, as the necessary infrastructure and projects come online, we will start to realise Ireland's enormous potential for offshore wind. In the meantime, to facilitate the major acceleration and increase in onshore wind turbines and solar PV required nationwide to achieve our national and regional targets, a previously unseen level of electricity network upgrades and construction will be required.'

## 12.6.2 Operational Baseline Scenario

This section describes the existing PPL production facility when the site was fully operational.

The site of the Proposed Development has an extensive industrial heritage, originally established in the 1930s as a cement production facility by Cement Ltd. This operation transitioned to a magnesia and magnesium hydroxide production facility in the 1970s under the ownership PPL.

PPL holds a current Industrial Emissions (IE) Licence (Reg No. P0376-02) licence for the 'production of lime in a kiln' and 'recovery or disposal of waste' at the subject site.

<sup>148</sup> The Sector 'Other' is made up of Waste, F-gases and Petroleum Refining.

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The facility also has a GHG permit (Reg. No. IE-GHG045-10366-4) which authorises the following named activities resulting in emissions of Carbon Dioxide from the listed emission sources at the site:

- 'Production of lime or calcination of dolomite or magnesite in rotary kilns or in other furnaces with a production capacity exceeding 50 tonnes per day;
- Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)'.

The existing magnesia and magnesium hydroxide production facility represents a highly carbon intensive industrial process, housed within a facility that precipitates a significant negative impact on the locality in terms of visual impact, air quality, and amenity.

At approximately 215,900 tCO<sub>2</sub> emissions during peak production<sup>149</sup>, and significant Sulphur Dioxide (SO<sub>x</sub>) and Nitrogen Dioxide (NO<sub>x</sub>) emissions, PPL is one of Ireland's most emissions intense industrial facilities representing a significant share of Ireland's industrial sector emissions. Industrial emissions are mainly attributable to the lime-production on the site.

The process requires the burning of 1,000 tonnes of limestone per day in kilns. This requires the combustion of ~15,000 tonnes/year of high-sulphur petroleum coke, a large volume of natural gas as well as substantial electricity consumption.

The process emissions of CO<sub>2</sub> from the lime production are also very significant as limestone is a compound of calcium, carbon and oxygen (CaCO<sub>3</sub>). When this is burned to produce lime (CaO), CO<sub>2</sub> is produced as a bi-product and accounts for approximately half of the process carbon emissions.

Carbon emissions are also generated from the wet end process where sulphuric acid is used to remove carbonates from seawater which then releases CO<sub>2</sub> into the atmosphere.

The SO<sub>x</sub> and NO<sub>x</sub> emissions which rise from the combustion of fuels including petroleum coke have a significant effect on air quality. NO<sub>x</sub> can further react to form N<sub>2</sub>O which has a GWP 265 times greater than CO<sub>2</sub> and has a lifespan of approx. 100 years.

While there is only limited production occurring at the facility currently (production of Magnesium Hydroxide (Mg(OH)<sub>2</sub>) suspension), the facilities remain in place to recommence production of Magnesia products at the site.

In the case where the Proposed Development does not receive planning permission, it is likely that PPL will return to full scale production in accordance with the terms of its existing IE licence, which would generate > 200,000 tCO<sub>2</sub> from the facility annually.

### 12.6.3 Existing Baseline Scenario

This section describes the current existing operations GHG emissions at the PPL site.

In recent years, the existing PPL facility has faced economic challenges due to escalating energy costs. Due to this production at the PPL facility has been ramped down in recent years with a corresponding reduction in GHG emissions (on average approx. 100,000 tCO<sub>2</sub> annually) and SO<sub>x</sub> and NO<sub>x</sub> emissions. Production of lime at the facility and the required thermal operations ceased at the end of Q2, 2022. Currently operations at the site consist of limited production of magnesium hydroxide (Mg(OH)<sub>2</sub>) suspension only.

### 12.6.4 Climate Change Resilience Baseline

Future baseline conditions are used to determine the likely future climate change impacts on the Proposed Development.

In 2020, research carried out by the Irish Centre for High-End Computing on behalf of the EPA was published, which included a new set of mid-21st-century (2041-2060) high-resolution climate

<sup>149</sup> For the purposes of this assessment and report, the GHG emissions figures from production operations (process emissions, petroleum coke combustion, natural gas combustion and electricity consumption) were typical of a high production year (2014).



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projections for Ireland. The Met Éireann website<sup>150</sup>, summarises these climate projections as follows:

- “temperatures are projected to increase by 1–1.6°C compared with the reference period (1981–2000), with an east-west gradient and with the largest increases in the east;
- warming will be enhanced at the extremes, with summer daytime and winter night-time temperatures projected to increase by 1–2.4°C;
- the number of frost and ice days will decrease by approximately 50%;
- summer heatwave events are expected to occur more frequently;
- precipitation is expected to become more variable, with substantial projected increases in the occurrence of both dry periods and heavy precipitation events;
- snowfall is projected to decrease substantially across the country;
- specific humidity is projected to increase substantially, while relative humidity is projected to increase slightly for all seasons except summer;
- mean 10-m wind speeds are projected to decrease for all seasons;
- an overall reduction of ~10% in the numbers of storms affecting Ireland, with an eastward extension of the more severe wind storms over Ireland and the UK;
- an increase in the length of the growing season of between 12% and 16%;
- the energy content of the 120-m wind is projected to decrease, while a small decrease in solar photovoltaic (PV) power is projected.”

With regard to rainfall, projections indicate a substantial increase in the frequency of heavy precipitation events in Winter and Autumn (approx. 20%)<sup>151</sup>. In addition, climate projections for Ireland indicate that water resources will become depleted both in terms of water supply and quality and this is against a background of increasing demand due to, amongst others, increased irrigation requirements<sup>9</sup>.

By the end of the 21<sup>st</sup> century, global mean sea level is expected to rise. With the increased warming of the ocean, the frequency of coastal storms is expected to increase and in combination, these changes are expected to exacerbate existing problems of coastal erosion and flooding<sup>152</sup>.

Climate change can have direct impacts upon biodiversity by shifting species or the timing of key life cycle events. Biodiversity changes can improve or worsen the impacts of climate change through altering surface characteristics and the benefit of the terrestrial carbon sink.

In Ireland, the main impacts of climate change on species and habitats have been changes in species abundance and distribution, phenology, community composition, and habitat structure and ecosystem processes. It is noted that these changes are in addition to significantly larger impacts on Ireland’s biodiversity and habitats arising from other direct human interventions<sup>153</sup>. The conservation status of 10% of Ireland’s known species has been assessed and found that one in every fifth species is threatened with extinction here<sup>154</sup>.

<sup>150</sup> Met Éireann (2020) “New Climate Projections 2020” <https://www.met.ie/epa-climate-projections-2020>, accessed 05 May 2024

<sup>151</sup> EPA (2023), “What Impact Will Climate Change Have on Ireland”, <https://www.epa.ie/environment-and-you/climate-change/what-impact-will-climate-change-have-for-ireland/#:~:text=Ireland's%20climate%20is%20changing%20in,depending%20on%20the%20emissions%20trajectory>, accessed 02 May 2024

<sup>152</sup> Climate Ireland, <https://www.climateireland.ie/#/tools/sectors/coastalAreas>, accessed 02 May 2024

<sup>153</sup> Government of Ireland (2023), “Ireland’s Climate Change Assessment, Vol 1 Climate Science – Ireland in a Changing World”, [https://www.epa.ie/publications/monitoring--assessment/climate-change/ICCA\\_Volume-1.pdf](https://www.epa.ie/publications/monitoring--assessment/climate-change/ICCA_Volume-1.pdf), accessed 30 May 2024

<sup>154</sup> Biodiversity Ireland, “Intergovernmental Panel on Biodiversity and Ecosystem Service (IPBES) and Ireland’s biodiversity crisis”, available at <https://biodiversityireland.ie/ipbes-irelands-biodiversity-crisis/>, accessed 02 May 2024

According to the EPA's Climate Ireland website<sup>155</sup>, Ireland's geographical features and prevailing climate mean that the key climatic hazards of concern are:

- Coastal erosion: rising sea levels will put Ireland's soft coastlines at increased risk from coastal erosion.
  - Projected changes in sea level in combination with projected increase in the severity of coastal storms is expected to exacerbate coastal erosion risk.
  - Areas of the north east coast of Ireland are likely to experience a coastal erosion rate of 2.2-3.7 mm per year.
- Inland flooding: changes in patterns of precipitation will increase flood risk and will put new areas at risk.
  - Areas already at risk of flooding can be expected to be at increased flood risk while areas currently not prone to flood risk may become more prone to flooding in the future.
  - Overall, modelling results indicate that increased precipitation will result in substantial increases in winter and spring stream flow for all of the catchments assessed and, as a result, an elevated risk of flooding.
  - Coastal flooding: sea level rise will put coastal areas at increased risk of flooding.
  - Sea levels will continue to rise for the coming century while the magnitude and intensity of coastal storms are expected to increase.
- Water scarcity: increased temperatures and decreased summer rainfall may result in increased drought risk.
  - Projections indicate an overall decrease in levels of precipitation during the summer months and this will lead to significant decreases in annual effective runoff and the availability of water supply for all sectors.

## 12.7 Potential Effects – Do Nothing Scenario

In the case where the Proposed Development does not receive planning permission, it is likely that PPL will return to full scale production in accordance with the terms of its existing IE licence.

As discussed in Section 12.6.3 above, the existing PPL facility has faced economic challenges in recent years. Due to this production at the PPL facility has been ramped down in recent years, but at no point did activities cease on site. A key factor in the scaling back of operations on site was the extreme rises in the price of gas resulting from Russia's invasion of Ukraine. Gas prices have now fallen from their 2022 peak<sup>156</sup> and are stabilising, meaning that a return to full scale production on site within the terms of the existing IE licence would be economically viable into the future. There is also continued strong demand for the type of products produced on the PPL site.

### 12.7.1 Construction Phase

In the scenario the Proposed Development would not proceed as planned, there would be no construction carbon emissions associated with the Proposed Development.

Therefore, this scenario can be considered **neutral and imperceptible** effect on climate due to the carbon emissions associated with the construction phase.

### 12.7.2 Operational Phase

As described above, should the Proposed Development not go ahead, PPL could envisage a return to peak production of magnesia products at the facility in accordance with the terms of the site's IE Licence and GHG permit.

<sup>155</sup> Climate Ireland, <https://www.climateireland.ie/impact-on-ireland/climate-hazards/>, accessed 02 May 2024

<sup>156</sup> SEAI Average gas prices to business (seai.ie)

In this scenario production would ramp up steadily to peak production which would generate approximately 215,900 tCO<sub>2</sub>e from the facility annually.

PPL have considered the use of solid recoverable fuel (SRF) waste to displace petroleum coke and some natural gas if returning to the production of magnesia products at the site. However this transition would require a review of the site's IE Licence and would still lead to significant GHG emissions being generated by the facility.

Therefore, this scenario can be considered to have a **negative, significant, and long-term** effect on climate due to the carbon emissions associated with the operation of the existing facility at peak production.

## 12.8 Potential Construction Effects

### 12.8.1 Embodied Carbon

The construction phase of the Proposed Development will give rise to GHG emissions. To assess these GHG emissions, the embodied carbon associated with the construction phase of the Proposed Development has been estimated according to the methodology described in Section 12.4.1.

The results of the embodied carbon assessment completed by AtkinsRéalis are presented here, first the full embodied carbon results for the four groups (EC, DC, Bio-Solar Façade, and External Works) assessed and then as a summary of the total upfront carbon emissions (modules A1 – A5 only) for the Proposed Development.

Table 12.8 illustrates the overall results of the embodied carbon assessment for the EC.

**Table 12.8:** EC Embodied Carbon Assessment Results by Life Cycle Module for Business as Usual Model and Proposed Development (Enhancements) Model (as provided by AtkinsRéalis)

| Building Life Cycle                                          | Module | BAU                 |                                          | Enhanced            |                                          |
|--------------------------------------------------------------|--------|---------------------|------------------------------------------|---------------------|------------------------------------------|
|                                                              |        | KgCO <sub>2</sub> e | KgCO <sub>2</sub> e / m <sup>2</sup> GIA | KgCO <sub>2</sub> e | KgCO <sub>2</sub> e / m <sup>2</sup> GIA |
| Carbon Sequestration                                         |        | -                   | -                                        | -                   | -                                        |
| Product Stage                                                | A1-A3  | 7,832,945           | 1,177.0                                  | 4,929,190           | 740.7                                    |
| Transport                                                    | A4     | 621,542             | 93.4                                     | 617,168             | 92.7                                     |
| Construction                                                 | A5w    | 481,883             | 72.4                                     | 360,192             | 54.1                                     |
|                                                              | A5a    | 1,258,488           | 189.1                                    | 1,258,488           | 189.1                                    |
| Upfront Carbon (Excluding Sequestration)                     | A1-A5  | 10,194,858          | 1,531.9                                  | 7,165,037           | 1,076.6                                  |
| In-Use Phase                                                 | B1-B5  | 2,695,637           | 405.1                                    | 2,224,621           | 334.3                                    |
| End-Of-Life Phase                                            | C1-C4  | 315,830             | 47.5                                     | 315,323             | 47.4                                     |
| Total – Life Cycle Embodied Carbon (Including Sequestration) | A-B-C  | 13,206,325          | 1,984.4                                  | 9,704,982           | 1,458.3                                  |

Table 12.9 illustrates the overall results of the embodied carbon assessment for the DC.

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**Table 12.9:** DC Embodied Carbon Assessment Results by Life Cycle Module for Business as Usual Model and Proposed Development (Enhancements) Model (as provided by AtkinsRéalis)

| Building Life Cycle                                                | Module | BAU                 |                                             | Enhanced            |                                             |
|--------------------------------------------------------------------|--------|---------------------|---------------------------------------------|---------------------|---------------------------------------------|
|                                                                    |        | KgCO <sub>2</sub> e | KgCO <sub>2</sub> e / m <sup>2</sup><br>GIA | KgCO <sub>2</sub> e | KgCO <sub>2</sub> e / m <sup>2</sup><br>GIA |
| Carbon Sequestration                                               |        | (276,098)           | -10                                         | (276,098)           | -10                                         |
| Product Stage                                                      | A1-A3  | 38,086,634          | 1,435                                       | 29,518,072          | 1,112                                       |
| Transport                                                          | A4     | 1,280,675           | 48                                          | 1,274,390           | 48                                          |
| Construction                                                       | A5w    | 1,728,216           | 65                                          | 1,347,819           | 51                                          |
|                                                                    | A5a    | 1,126,510           | 42                                          | 1,126,510           | 42                                          |
| Upfront Carbon<br>(Excluding Sequestration)                        | A1-A5  | 42,222,035          | 1,590                                       | 33,266,791          | 1,253                                       |
| In-Use Phase                                                       | B1-B5  | 11,726,046          | 442                                         | 11,454,209          | 431                                         |
| End-Of-Life Phase                                                  | C1-C4  | 1,575,840           | 59                                          | 1,555,992           | 59                                          |
| Total – Life Cycle<br>Embodied Carbon<br>(Including Sequestration) | A-B-C  | 55,247,824          | 2,081                                       | 46,000,895          | 1,733                                       |

Table 12.10 illustrates the overall results of the embodied carbon assessment for the External Works included as part of the Proposed Development. It is noted that no enhancements providing carbon reductions have yet been agreed for the external works at this stage of the project design and therefore only the BAU results are provided here.

**Table 12.10:** External Works Embodied Carbon Assessment Results by Life Cycle Module for Business as Usual Model (as provided by AtkinsRéalis)

| Building Life Cycle                                             | Module                | Carbon Emissions   |
|-----------------------------------------------------------------|-----------------------|--------------------|
|                                                                 |                       | tCO <sub>2</sub> e |
| Carbon Sequestration                                            |                       |                    |
| Product Stage                                                   | A1-A3                 | 6,121              |
| Transport                                                       | A4                    | 3,228              |
| Construction                                                    | A5w                   |                    |
|                                                                 | A5a                   | 2,314              |
| Upfront Carbon<br>(Excluding Sequestration)                     | A1-A5                 | 11,663             |
| In-Use Phase                                                    | B1-B5                 | 8,820              |
| End-Of-Life Phase                                               | C1-C4                 | 15                 |
| Total – Life Cycle Embodied Carbon<br>(Including Sequestration) | A-B-C<br>(Excl B6-B7) | 20,498             |

Table 12.11 illustrates the overall results of the embodied carbon assessment for the Bio-Solar Façade on the southern face of the DC Building.

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**Table 12.11:** Bio-Solar Façade Embodied Carbon Assessment Results by Life Cycle Module for Business as Usual Model and Proposed Development (Enhancements) Model (as provided by AtkinsRéalis)

| Building Life Cycle                                          | Module | BAU                  | Enhanced            |
|--------------------------------------------------------------|--------|----------------------|---------------------|
|                                                              |        | KgCO <sub>2</sub> e  | KgCO <sub>2</sub> e |
| Carbon Sequestration                                         |        | -                    | -                   |
| Product Stage                                                | A1-A3  | 1,081,439            | 919,500             |
| Transport                                                    | A4     | 27,147               | 17,083              |
| Construction*                                                | A5w    | 37,980               | 30,721              |
|                                                              | A5a*   | Incl. in Data Centre |                     |
| Upfront Carbon (Excluding Sequestration)                     | A1-A5  | 1,146,566            | 967,304             |
| In-Use Phase                                                 | B1-B5  | 359,000              | 320,336             |
| End-Of-Life Phase                                            | C1-C4  | 17,148               | 17,131              |
| Total – Life Cycle Embodied Carbon (Including Sequestration) | A-B-C  | 1,522,715            | 1,304,772           |

\*The cost associated with the construction of the bio-solar façade was included as part of the overall Data Hall costs. Therefore, the A5a emissions associated with the Bio-Solar Wall are already accounted for under the A5a emissions of the Data Centre and were not listed separately to avoid double counting.

Table 12.12 and Figure 12.3 provide a summary of the total tonnage of upfront carbon emissions associated with the business as usual scenario and the Proposed Development scenario for each group included in the study.

**Table 12.12:** Total Upfront Carbon Emissions for the Different Sections Within the Proposed Development and the total A1-A5 emissions (as provided by AtkinsRéalis)

| Upfront Carbon A1-A5 (tCO <sub>2</sub> e) |          |          |
|-------------------------------------------|----------|----------|
|                                           | BAU      | Enhanced |
| Energy Centre                             | 10,194.9 | 7,165.0  |
| Data Centre                               | 42,222.0 | 33,266.8 |
| BioSolar Wall                             | 1,146.6  | 967.3    |
| External Works                            | 11,663.0 | 11,663.0 |
| Total                                     | 65,226.5 | 53,062.1 |



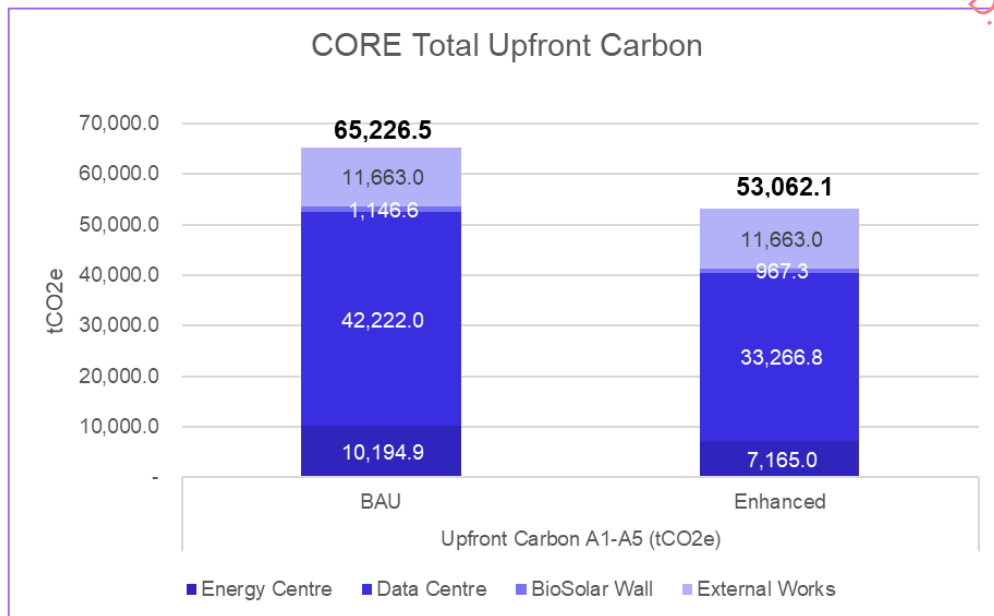


**Figure 12.3:** Total Upfront Carbon Emissions for the Different Sections within the Proposed Development and the total A1 – A5 emissions (as provided by AtkinsRéalis)

As can be seen from Table 12.12, EC BAU upfront carbon emissions are 10,195 tCO<sub>2</sub> [A1-A5], and when incorporating the carbon reduction enhancements, the upfront carbon estimate for the Proposed Development (enhanced) EC is reduced by 30% to 7,165 tCO<sub>2</sub>.

The DC BAU upfront carbon emissions are 42,222 tCO<sub>2</sub> [A1-A5], and when incorporating the carbon reduction enhancements, the upfront carbon estimate for the Proposed Development (enhanced) DC is reduced by 21% to 33,267 tCO<sub>2</sub>.

In relation to the Bio-Solar Façade on the southern face of the DC, BAU upfront carbon emissions are 1,147 tCO<sub>2</sub> [A1-A5], and when incorporating the carbon reduction enhancements, the upfront carbon estimate for the Proposed Development (enhanced) Bio-Solar Façade is reduced by 16% to 967 tCO<sub>2</sub>.

As noted earlier, there have been no carbon reduction enhancements yet agreed for the External Works at this stage of project design and therefore there is no reduction from the BAU scenario to the Proposed Development scenario.

Overall the enhancements included in the Proposed Development demonstrate a notable 19% reduction in carbon emissions compared to the BAU model. These reductions have been achieved as a result of the carbon reduction strategies which have been incorporated into the design of the Proposed Development as detailed in Section 12.4.1 of this Chapter.

#### **Alignment with the Climate Action and Low Carbon Development (Amendment) Act 2021 and CAP24:**

As described in Section 12.3.3 of this Chapter, the following key targets have been set for the Industrial Sector in relation to embodied carbon in construction materials:

- By 2025: Decrease by 10% for materials produced and used in Ireland.
- By 2030: Decrease by 30% for materials produced and used in Ireland.

While the key targets have been set for the Industrial Sector as a whole and are not mandatory targets on a specific project basis, these reduction targets have been used as a guidance to set the upfront carbon emissions reduction target of 10% for the Proposed Development.

As illustrated in Table 12.12, the carbon reduction strategies for the Proposed Development will result in a 19% reduction in upfront carbon emissions from the BAU scenario. This reduction is

attributable to concrete specification, steel rebar fabrication, structural steel enhancements and recycled content of PV panels.

It is noted that the use of recycled steel will be required to be sourced from outside of Ireland as it is not currently manufactured here. In addition the PV panels included in the Proposed Development will not be manufactured in Ireland. Therefore reductions of upfront carbon achieved due to the carbon reductions made in relation to steel and the PV panels will not contribute directly to the Carbon Budget targets set out for a reduction of embodied carbon from materials produced and used within Ireland. However, the Proposed Development will increase the demand for recycled steel and PV panels within Ireland therefore contributing positively to the CAP24 key targets for the reduction of embodied carbon associated with the Industrial Sector.

### **Alignment with Ireland's Sectoral Emissions Ceilings for Industry**

As the majority of the construction phase of the Proposed Development is likely to take place between the years 2026 - 2028, the embodied carbon associated with the Proposed Development is compared against Ireland's defined carbon budget period of 2026 to 2030. As set out in Section 12.3 of this Chapter, the Industry Sector Carbon Budget for this period is 24 MtCO<sub>2</sub>. Therefore, the total upfront embodied carbon calculated for the Proposed Development (53,062 t CO<sub>2</sub>e) would constitute 0.2% of this carbon budget for the Industry Sector.

In reality the contribution of the Proposed Development to embodied carbon emissions in Ireland will be less than this as the results for the total upfront embodied carbon calculated for the Proposed Development include carbon emissions which will be produced outside of Ireland for the recycled steel and the PV panels: emissions associated with the excavation, processing of raw materials and manufacture (life cycle stages A1-A3) of these materials.

Therefore, this element of the upfront embodied carbon associated with the Proposed Development will not contribute to Ireland's carbon budgets as these budgets are based on the emissions directly produced in Ireland. This aligns with the approach in the TII (2022) Guidance.

The results of the embodied carbon assessment demonstrate tangible carbon savings achieved through selected carbon reduction interventions, paving the way for a more sustainable development. The project is committed to meeting carbon reduction targets set by industry benchmarks underscoring its dedication to environmental stewardship and responsible construction practices.

As demonstrated above, the Proposed Development is firmly aligned with direction of national and local policy including the Climate Action and Low Carbon Development (Amendment) Act 2021, CAP24, Ireland's Long Term Strategy on GHG reductions 2024, the NAF, Ireland's national climate objective, and the LCDP 2021 - 2027.

Acknowledging the volume of GHG emissions associated with the embodied carbon of the Proposed Development and considering the global science based 1.5°C trajectory (in terms of rate of emissions reduction), consideration was given to the Proposed Development being found to have a '*moderate adverse*' effect in accordance with the criteria set out in Table 12.7, Section 12.4.1 '*GHG Significance Criteria*'.

However, in considering this effect, it is relevant to acknowledge;

- firstly, that practical implementation of reductions of embodied carbon in Irish construction materials is at a very early stage given that Ireland's Climate Action Plans as statutory instruments have only recently begun to influence this sector, thus as the industry adapts it is likely further reductions in the Proposed Development's contribution to Ireland's carbon emissions will be possible.
- and, secondly the applicant is committed to targeting achievement of at least the 10% reduction in embodied carbon for upfront carbon emissions associated with the Proposed Development which aligns with the CAP24 Industry Sector key targets. Tracking of progress towards the KPI reduction target will be completed throughout the remaining design and construction stages of the development as the required information becomes available.

- Additionally, it's noteworthy that there are significant carbon savings from the project that have not been quantified in this report. This includes the reuse of existing infrastructure and the retention of multiple structures, such as the Workshop Building, 3 no. silos, Partial Crane Shed, and seawater tanks.
- As the development progresses, ongoing monitoring and optimisation will be crucial to ensuring continued alignment with carbon reduction goals and industry standards. The procurement stage has a very big influence on the actual embodied carbon impacts arising from the development, and therefore extra care should be given to this stage.

For these reasons, and having regard to the overall reductions of embodied carbon for the project, we consider the Proposed Development will have a '*minor adverse*' impact as the initiatives being implemented by the applicant represent industry best practice and support the achievement of reduction in the total embodied carbon in the industry sector and "*Ireland's trajectory towards net Zero*".

In addition, it is noted that the embodied carbon emissions will be once-off and unavoidable carbon emissions associated with development. Therefore, it is considered the overall effects of the total embodied carbon emissions, having regard to national industry carbon targets set-out in the CAP24 are considered '*minor adverse*' and therefore '*not significant*' in accordance with the criteria set out in Table 12.7, Section 12.4.1 '*GHG Significance Criteria*'.

## 12.8.2 Climate Change Resilience Assessment

Examples of climate risks associated with the construction phase of the Proposed Development include:

- Health and Safety risks to workforce in severe weather events;
- Obstruction of access to the construction site due to consequences of a severe weather event (storms, flooding, snow, ice);
- Delays caused by unsuitable conditions for certain construction activities due to extremes of hot, wet or cold weather;
- Damage of construction equipment, plant, materials and temporary construction buildings/facilities due to stormy weather.

The above climate change resilience effects during construction are expected to be potentially negative but imperceptible and short term (in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance) if correctly managed by the Construction Management Team.

## 12.9 Potential Operational Effects

### 12.9.1 Operational Carbon

The operation of the Proposed Development will generate GHG emissions in the following ways:

- The operation of the tertiary reserve gas engines;
- Indirect GHG emissions from electricity imported from the national grid;
- Consumption of water (excluded from calculation due to minimal use, refer to Section 12.5.1).

As described in Section 12.2.2 of this Chapter, the proposed CORE EC will provide a mix of on-site renewable generation, off-site renewable energy PPAs, gas generation, and power conditioning. As part of Phase 1 CORE, the only user of electricity on the site will be the proposed DC which will be the first tenant of the campus.

The campus will consume electricity when the grid's fuel-mix is predominantly renewable. At peak electricity demand, the grid is most vulnerable and at its highest carbon intensity due to the increased demand requiring older more carbon intense national energy generators (e.g. coal) to be switched on to provide the necessary extra power to meet demand. At these times, the proposed campus will provide a demand-response (reduces its grid electricity demand to near zero and

provides its own power), leaving the energy market and supporting the loads with its own assets enabling the reduction/elimination of emissions in real-time (hour-for-hour) on the campus.

The flexible operation of the CORE EC by the EScO will achieve the lowest carbon intensity generation of power for the site depending on real time circumstances.

For example:

- In windy conditions, the BESS batteries will charge at night, increasing demand and reducing night-time curtailment. The batteries will then discharge during the evening peak to ensure no load on the system. There is no requirement to run gas engines in these conditions.
- In moderate wind conditions, the gas engines and the batteries will outperform the grid during the day reducing load on the grid (referred to as 'demand response'). At night-time, with low emissions intensity, the site would become a consumer again and also recharge its batteries during the night.
- In calm conditions, and when renewables on the system are scarce, the site could potentially export power to the national grid from the gas engines, reducing the overall load on the system.
- On-site solar generation will also reduce demand during day-time.

A detailed analysis of the operating modes of the Proposed Development both as a consumer and producer of electricity dependent on real time grid GHG emissions is set out in the Energy and Emissions Modelling Report which accompanies this planning application.

Mitigation and offsetting of operational GHG emissions is an inherent part of the design of the Proposed Development. The EPA (2022) Guidance clarifies the distinction between mitigation measures and compensation measures, with offsetting being considered a compensation measure rather than mitigation.

As described in detail in the Energy and Emissions Modelling Report which accompanies this planning application, the Proposed Development follows a decarbonisation pathway to net-zero GHG emissions from operations that aligns with the EPA (2022) Guidelines in relation to mitigation and offsetting of operational GHG emissions. A summary of this decarbonisation pathway set out in the Energy and Emissions Modelling Report is presented here.

The Proposed Development has firstly included mitigation as part of the development design, systematic (cumulative) decarbonisation second, and finally will look to offset or compensate for the remaining operational GHG emissions through the use of PPA's as required.

The key decarbonisation mitigation/ offsetting steps included as part of the Proposed Development and further measures envisaged for the campus in the future are illustrated/summarised in Figure 12.4.

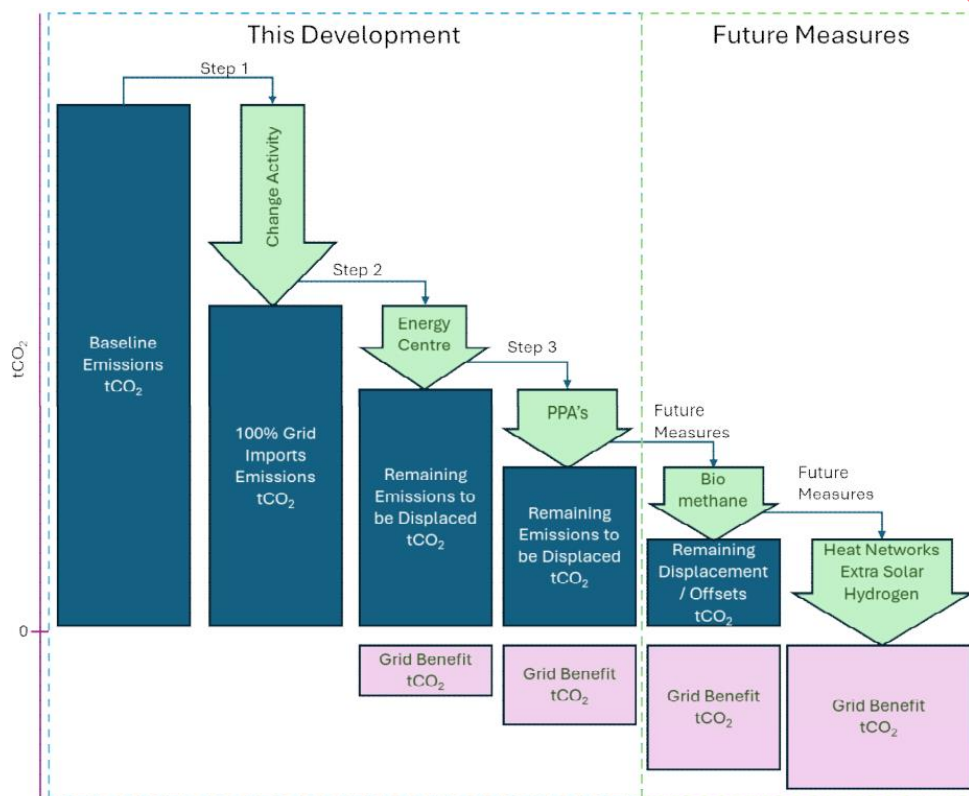


**Figure 12.4:** Decarbonisation pathway included with Proposed Development including mitigation and offsetting measures

The sequential approach to decarbonisation and associated mitigation measures outlined in Steps 1 to 3 of Figure 12.4 are described below in detail.

Future mitigation measures envisaged for the campus are discussed in Section 12.12 '*Potential Residual Effects*' of this Chapter in accordance with the IEMA (2022) Guidance. However, for the avoidance of any doubt, it is noted that these future measures are not relied on in the climate impact assessment for the Proposed Development as set out in this section. Only measures included with the Proposed Development (up to step 3 on Figure 12.4) are included in the assessment of potential operational effects on climate.

### Step 1: Change of Activity

The first step in the decarbonisation journey for the existing PPL site is the change of activity from the current carbon intensive production of magnesia products (as described in detail in Section 12.6.2 of this Chapter).

In the 'Do Nothing Scenario' described in Section 12.7.2 of this Chapter, PPL would return to full operations at the site giving rise to significant GHG emissions of approximately 215,900 tCO<sub>2</sub> per year as a worst case.

The Proposed Development represents a significant investment by PPL to identify the most appropriate alternative site use to mitigate its effect on climate by changing its core activities, thereby, avoiding or eliminating very significant GHG emissions.

Figure 12.5 shows the avoided or displaced GHG emissions (approximately 150,000 tCO<sub>2</sub> - a 70% reduction) due to the change of activities on the site from the production of magnesia products to a conventional DC importing 100% of its annual energy requirement from the grid (generating 66,300 tCO<sub>2</sub>). As is detailed in Step 2 and Step 3 below, the Proposed Development will go much further than that and achieve much greater emissions reductions.



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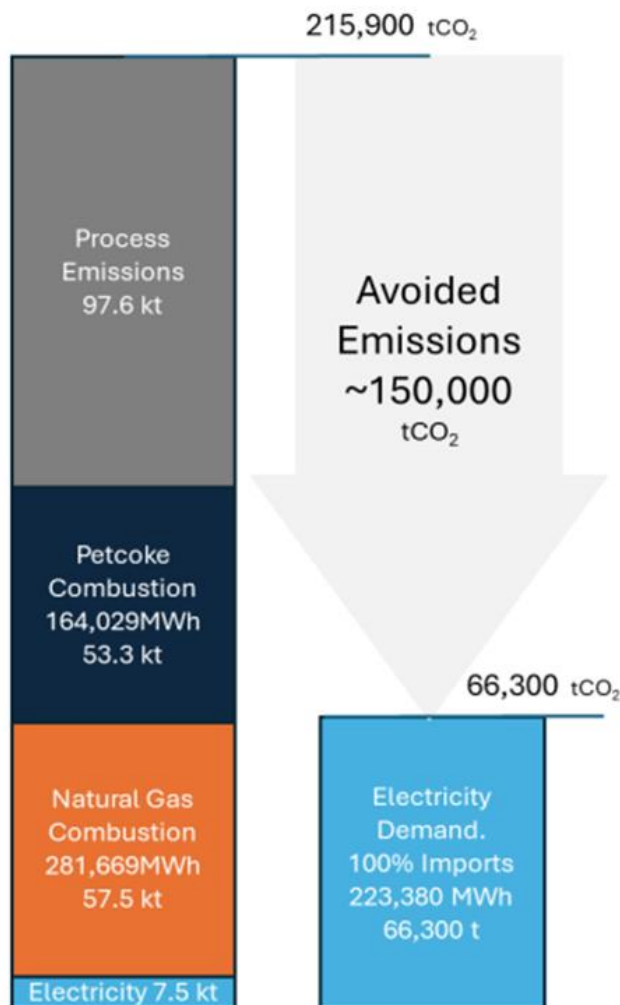


**Figure 12.5:** Reduction in GHG Emissions at the PPL Site Possible Through Change of Activity As a Result of the Proposed Development

The breakdown of emissions reductions possible compared to the emissions associated with importing the required electricity from the grid in the year 2030 is given below as the focus year for the operational carbon assessment.

**Electricity Demand (or Load):** The electricity load is modelled as a flat steady load of 25.5 MW required for DC operations representing about 70% of the DC design load (32 MW). This represents a total annual electricity consumption of 223,380 MWh that will be provided by all the energy sources available to the CORE EC. It is noted that DC operations encompass both IT and non-IT equipment, as well as the ancillary systems supporting these operations. In reality this load fluctuates with Information Technology (IT) operational activity and energy requirements for cooling. New generation IT loads associated with artificial intelligence or high performance computing can be much more variable, which may present more flexible demand opportunities in years to come.

**Grid Intensity:** The grid intensity of the modelling is based on a number of detailed assumptions as described in detail in the Emissions and Energy Modelling Report which accompanies this planning application.

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## Step 2: Mitigation of Imported Electricity Emissions Using On-Site Assets

As part of Step 2 of its decarbonisation journey, PPL have used on-site renewable generation via solar PV panels, energy storage via batteries, and electricity generation by gas engines included as part of the Proposed Development to augment the grid-supply to provide significantly decarbonised, conditioned power to the proposed on-campus DC. This energy infrastructure allows PPL to mitigate the cumulative effects of the energy use required for operation of the DC in every hour during the lifetime of the plant.

As described in Section 12.2.2, the Proposed Development will provide a flexible demand response and support the load of the DC with its on-site assets when the carbon intensity of the grid is higher than the carbon intensity of the on-site assets. This will be managed by the dedicated ESCo whose key focus is the safe and reliable operation of the site with a mission to decarbonise operational GHG emissions as quickly and effectively as possible.

The minimum GHG emissions mitigation results which can be realised through the use of the proposed energy infrastructure are presented in Figure 12.6. The breakdown of emissions reductions possible compared to the emissions associated with importing 100% of the required electricity from the grid in the year 2030 is given below as the focus year for the operational carbon assessment. Figure 12.6 also illustrates the energy modelling results for future years in the decarbonisation journey for the Proposed Development with the use of the proposed on-site energy infrastructure.

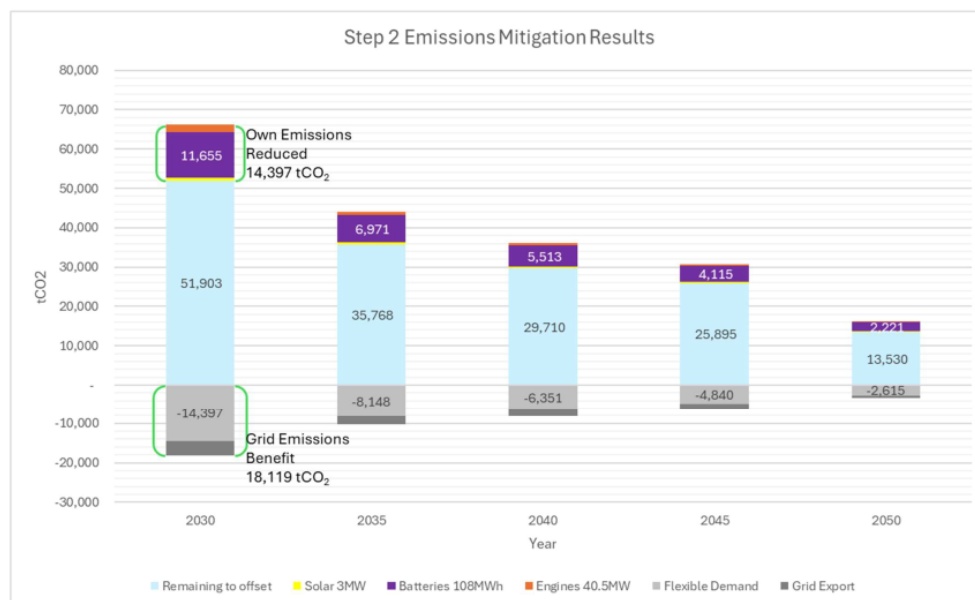


**Figure 12.6:** Reduction in GHG Emissions at the PPL Site Possible Through Use of On-Site Assets as part of the Proposed Development

### Flexible Demand Response - Own Emissions Reduction

**Load:** The load is modelled as a flat steady load of 25.5 MW required for DC operations representing about 70% of the DC design load (32 MW): 223,380 MWh. In reality this fluctuates with IT operational activity and energy requirements for cooling. It is noted that new generation IT loads associated with artificial intelligence or high performance computing can be much more variable, which may present more flexible demand opportunities in years to come.

**Grid Intensity:** The grid intensity of the modelling is based on a number of detailed assumptions as described in detail in the Emissions and Energy Modelling Report which accompanies this planning application. It is noted that GHG emissions associated with the electricity consumption from the grid will reduce in future. This is because the grid will get 'greener': the GHG emissions associated with power generated for the grid will reduce with the increase in grid power supplied from renewable and green technologies in future.

**Solar:** An on-site solar PV panel array of 3 MW was modelled at a 10.6% capacity factor. As this is renewable generation behind the meter<sup>157</sup>, it will always be consumed by the DC ahead of electricity grid imports. In the year 2030, the model predicts that the on-site solar PV will generate 2,794 MWh electricity for use by the DC which equates to 747 tCO<sub>2</sub> of displaced grid GHG emissions when compared with the GHG emissions associated with getting this power from the grid. It is noted from Figure 12.6 that as the grid itself gets greener in future, the solar PV array will still produce the same energy, but will displace less emissions because with greener assets supplying energy to the grid there are fewer emissions to displace.

**Batteries:** 108 MWh capacity battery storage was modelled with 1% degradation per cycle and a refresh limit of 75%. While the system can support the design load for 3 hours (maximum discharge 36 MW over 3 hours), the operational load which requires a slightly lower rate of discharge can be supported for over 4 hours. Some energy is always reserved to be able to support the load and provide grid power conditioning support services. The remainder is modelled to store off-peak energy and discharge to the DC during the evening peak. This reduces the load on the grid and avoids typically higher emission grid imports at these times. In the year 2030, this equates 26,093 MWh and 11,655 tCO<sub>2</sub> of displaced grid emissions when compared with the GHG emissions associated with getting power from the grid at these times.

**Gas Engines:** Nine 4.5 MW reciprocating gas engines with 46% efficiency were modelled using 100% natural gas fuel. The engines are only utilised by the model when they outperform the marginal generators on the grid for emissions intensity. They are to be used mostly for demand response but could also export electricity at times when there is a scarcity of generation on the grid. Based on this model for the year 2030, the gas engines would run for 597 hours per year for demand response which would generate 18,465 MWh electricity and would displace 1,995 tCO<sub>2</sub> of grid emissions when compared with the GHG emissions associated with getting this power from the grid.

**Remaining to Offset:** Combined, the use of the on-site solar PV panel array, batteries and gas engines in 2030 will supply 47,352 MWh to the DC and gives a total reduction of GHG emissions of 14,397 tCO<sub>2</sub> (**22 % reduction**) compared to the that which would be associated with 100% electricity grid imports (66,300 tCO<sub>2</sub>).

This leaves 51,903 tCO<sub>2</sub> from emissions associated with electricity imported from the grid and use of the gas engines on site to be further mitigated or offset in the year 2030. As this is the minimal GHG emissions mitigation results which can be realised through the use of the proposed energy infrastructure as part of the Proposed Development, this represents the worst case scenario in terms of GHG emissions associated with the operational phase of the Proposed Development.

#### Grid Emissions Benefit

The light grey section of the bars in Figure 12.6 is used to illustrate the flexible demand response achieved from the grid's perspective where the grid did not have to produce energy as it was generated and/or stored by on-site assets at a lower carbon intensity than that of the grid (as described in the section above). In the year 2030, this accounts for 47,352 MWh and a 14,397 tCO<sub>2</sub> reduction compared to emissions that would have been produced if this power was consumed 100% from the grid.

Additionally there is the possibility for a further reduction in grid emissions by 3,722 tCO<sub>2</sub> (represented by the dark grey) as a result of the possible export of surplus low carbon electricity onto the grid from the batteries (7,385 MWh exported giving 3,500 tCO<sub>2</sub> reduction) and gas engines running for 126 hours (3,879 MWh exported giving a 222 tCO<sub>2</sub> reduction) at the site in the year 2030.

Therefore the potential total benefit of reduced GHG emissions on the grid in the year 2030 as a result of the flexible demand response and export of power from the Proposed Development is 18,119 tCO<sub>2</sub>.

<sup>157</sup> 'behind the meter' refers to energy systems located on the customer's side of the utility meter.

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### Step 3: Further Mitigation of Imported Electricity Emissions Using PPA's in Real-Time

As described above and illustrated in Figure 12.6, in 2030, the remaining GHG emissions to be further mitigated or offset after the use of on-site assets to provide electricity at a lower carbon intensity than that of the grid is 51,903 tCO<sub>2</sub>.

To offset more of these remaining GHG emissions, a PPA can be used to purchase renewable power generated by a wind farm or solar farm.

While the ESCo team will arrange the wind PPA as the energy broker, the tenants of the campus will ultimately be the counterparty in the PPA renewables contract as is the case for any energy supply to the site including electricity and gas from their respective grids. The tenant will have the contract with the energy utilities. PPL as the GHG permit holder are responsible for GHG emissions related to the energy operations. As the end user of the energy, the tenants' decisions in relation to PPA's for wind or solar will directly impact emissions. It will be a condition of tenancy that tenants bring an appropriately sized PPA (wind or solar) that will offset GHG emissions generated from tenant's operations and give the same decarbonisation effect as outlined here.

Figure 12.7 illustrates the effect of using a 60 MW wind PPA in addition to the on-site assets as described in Step 2. In theory, a 60 MW wind PPA should be enough to displace the remaining GHG emissions generated by electricity required for DC operations at the Proposed Development (51,903 tCO<sub>2</sub>). However, the results from the energy model for Step 3 predict that only approximately 35,344 tCO<sub>2</sub> will be mitigated in this scenario. This is because the model is projecting how much power from the PPA realistically will have generation and demand alignment in real time, thus showing the lower actual effectiveness of PPAs. The results also show the limitations of considering PPA's on an annual basis.

The breakdown of emissions reductions possible compared to the emissions associated with importing 100% of the required electricity from the grid in the year 2030 is given below as the focus year for the operational carbon assessment. Figure 12.7 also illustrates the energy modelling results for future years in the decarbonisation journey for the Proposed Development the use of the proposed on-site energy infrastructure and the incorporation of a 60 MW wind PPA.

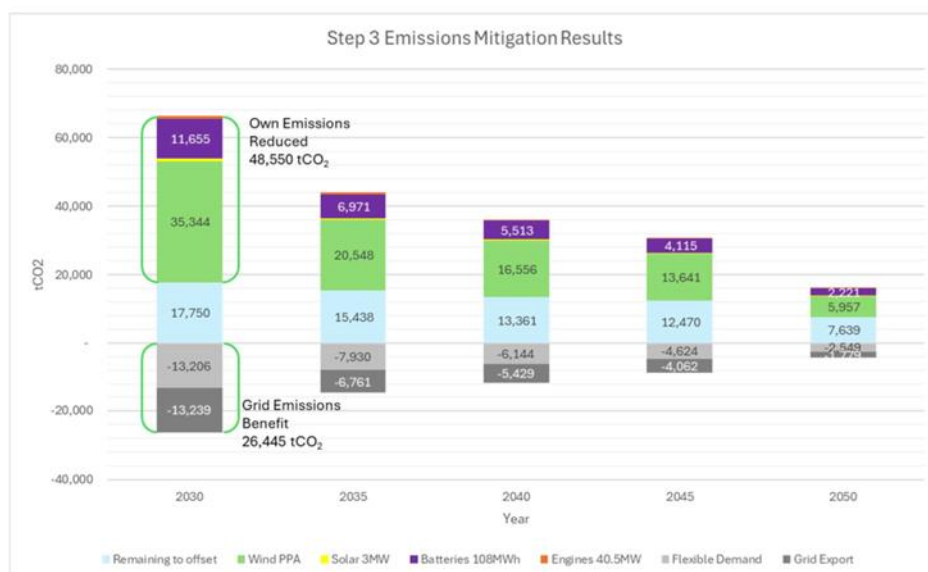


**Figure 12.7:** Reduction in GHG Emissions at the PPL Site Possible Through Use of On-Site Assets as part of the Proposed Development and a Wind PPA

Flexible Demand Response - Own Emissions Reduction

In this model, the parameters for load, grid intensity, **batteries** and the **solar** PV panel array remain as per described in Step 2.

In the year 2030, the model predicts that the use of the batteries will store and discharge 26,093 MWh of electricity and displace 11,655 tCO<sub>2</sub> of grid GHG emissions. The use of the **solar** PV panel array will generate 2,794 MWh electricity and displace 747 tCO<sub>2</sub> GHG emissions that would have been produced if this electricity was consumed 100% from the grid.

**Gas Engines:** In the year 2030, the addition of the wind PPA reduces the required running time of the gas engines down to 457 hours. This is because the energy provided by the wind PPA is less carbon intense than the engines and so they are required to run less. This reduces the power supplied from running the gas engines in the model to 9,772 MWh and as a result the emissions reduction achieved in running the engines versus importing electricity from the grid from a 1,995 tCO<sub>2</sub> reduction (in Step 2) to an 804 tCO<sub>2</sub> reduction.

Combined, the use of the on-site assets (solar PV panel array, batteries and gas engines) will account for a 13,206 tCO<sub>2</sub> reduction in emissions in the year 2030 versus the emissions which would arise from importing electricity from the grid.

**Wind PPA:** In the year 2030, the model predicts that the addition of the wind PPA will provide 144,369 MWh to the DC which equates to 35,344 tCO<sub>2</sub> of displaced grid GHG emissions. It is noted from Figure 12.7 that as the grid gets greener into the future, the wind PPA becomes less effective at displacing emissions because there is a lower intensity of emission on the grid than can be displaced.

**Remaining to Offset:** Combined, the use of the on-site solar PV panel array, batteries, gas engines and a 60 MW wind PPA in 2030 will supply 183,028 MWh of electricity to the DC and gives a total reduction of grid GHG emissions of 48,550 tCO<sub>2</sub> (73% reduction) compared to the that which would be associated with 100% electricity grid imports (66,300 tCO<sub>2</sub>).

This leaves 17,750 tCO<sub>2</sub> residual GHG emissions associated with electricity imported from the grid and use of the gas engines on site to be further mitigated or offset.

#### Grid Emissions Benefit

The **light grey** section of the bars in Figure 12.7 represents the flexible demand response from the grid's perspective where the grid did not have to produce energy as it was generated and/or stored by the on-site assets at a lower carbon intensity than that of the grid (as described in the section above). This accounts for the 13,206 tCO<sub>2</sub> reduction in emissions compared to emissions that would have been produced if this power came from 100% electricity grid import alone in the year 2030.

Additionally there is a potential further reduction 13,239 tCO<sub>2</sub> on the grid in the year 2030 represented by the **dark grey** as a result of the possible export of lower carbon electricity onto the grid from the batteries (7,835 MWh exported giving a 3,500 tCO<sub>2</sub> reduction), gas engines running for 97 hours (2,079 MWh exported giving a 115 tCO<sub>2</sub> reduction), and export of surplus wind energy<sup>158</sup> (39,312 MWh exported giving a 9,624 tCO<sub>2</sub> reduction).

Therefore the potential total benefit of reduced GHG emissions on the grid in the year 2030 as a result of the flexible demand response and possible export of power from the Proposed Development is 26,445 tCO<sub>2</sub>.

#### **Alignment With the Climate Action and Low Carbon Development (Amendment) Act 2021 and CAP24:**

##### CAP24 Chapter 12: Electricity

CAP24 states that achieving further emissions reductions between now and 2030 requires a major step up across the following 3 measures for the Electricity Sector:

<sup>158</sup> This would occur when the energy generated by the wind farm associated with the PPA exceeds the energy requirements of the site in any hour. This energy would be made available to the rest of the grid through trading in the balancing market and would negate national generators having to be switched on.



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1. accelerate and increase the deployment of renewable energy to replace fossil fuels;
2. deliver a flexible system to support renewable energy by improving system services and increasing storage capacity; and
3. manage demand.

The impact/contribution of the Proposed Development on these measures is described here.

### **1. Accelerate Renewable Energy Generation**

The Proposed Development will help to strengthen the electricity system by using the existing grid infrastructure (38kV) to deliver renewable generation from solar as well as energy storage.

The Proposed Development could support a number of grid services (enhanced frequency response, reserve power, and voltage support) required under Eirgrid's *Delivering a Secure, Sustainable Electricity System* (DS3) program which are required to address the inherent challenges posed by high penetration of renewable energy sources into the grid. The DS3 program aims to ensure that Ireland's electricity grid can handle a high penetration of renewable energy, maintaining a secure, reliable, and sustainable electricity system.

The BESS and UPS included as part of the Proposed Development could support the DS3 power security and conditioning services that require the most rapid response with the UPS ability to react to a broad spectrum of utility voltage events instantaneously with the ability to support the load for over 20 seconds. The batteries come online in 150-200 ms and could continue to provide further grid support until the engines became available after 4.5 minutes. The batteries could continue support then for 3 hours and the engines could continue support for as long as they are needed.

Due to the overlap in capabilities of each technology, the level of service that could be delivered as a demand side unit (DSU) would be capped at the maximum export connection (MEC) Level.

The capability of potentially delivering such a comprehensive service with significantly decarbonised assets could bring significant value to the safe and sustainable operation of the grid.

### **2. Deliver a Flexible System**

The Proposed Development will deliver 40.5 MW of new flexible gas-fired distributed generation. This presents a substantial opportunity for transitioning to decentralised generation on a large scale. The Proposed Development will produce its own electricity on-site when it can out-perform the carbon intensity of centralised power plants supplying the national grid.

Moreover, the Capacity Market's inability to attract new centralised plants, coupled with declining capacity factors, highlights the potential role of LEUs as part-time or occasional generators.

The proposed CORE EC has been designed to have the ability to deliver the full gambit of grid services to provide the potential for power generation from low or zero carbon sources and will be available to displace existing carbon heavy energy sources by the expected opening year 2028, pending planning permission. The gas engines running on natural gas could generate electricity for the grid more efficiently and with lower GHG emissions than all centralised peat, coal, oil and open cycle gas turbine (OCGT) national generators supplying the grid.

The campus will deliver fully flexible demand response with distributed generation and storage that will facilitate demand flexibility and provide flexibility to support the system operation and local network congestion management. It could potentially also provide voltage and frequency correction support.

### **3. Manage Electricity Demand Growth**

Managing Ireland's growing electricity demand effectively will necessitate greater demand flexibility, enhanced infrastructure, and supportive policies. A crucial strategy will involve limiting peak demand during times when renewable resources are scarce, emphasising the importance of improved flexibility and demand management techniques. In the immediate and medium term, the expanding demand from LEUs, like DCs, will need to be carefully managed to safeguard the security of supply and align with established carbon budget initiatives.

The Proposed Development supports the DC as a LEU to achieve carbon-free demand in Ireland so that electricity decarbonisation, demand efficiency and flexibility, and enterprise growth can go

hand in hand. This will contribute to the CAP targets to achieve 20% to 30% Demand flexibility by 2030.

The proposed EC will operate on a real-time basis and will be uniquely utilised only on emissions constraints. It is set to optimise its storage and generation against the emissions of the grid in each hour, and not firstly on a commercial margin basis.

The Proposed Development will have the capability of exporting surplus lower carbon electricity onto the grid subject to agreement with the Systems Operator. Therefore, there is a significant benefit of reduced GHG emissions associated with power on the grid achieved as a result of the flexible demand response and potential export of power from the Proposed Development.

### CAP24 Chapter 13: Industry

As set out in Section 12.3 of this Chapter, in the next budgeting period (2026-2030) when the Proposed Development is likely to be operational, the industrial sector is to adhere to a sectoral emission ceiling of 24 MtCO<sub>2</sub>, which breaks down to an annual average 4.8 MtCO<sub>2</sub> per year. However, the applicable emissions ceiling in the final year of the 2026 – 2030 carbon budget period (2030) is set at 4 MtCO<sub>2</sub>.

The Proposed Development plans for an evolution of the existing carbon intensive industrial site (Step 1 of the site's decarbonisation pathway); making a transition to become a leader in industrial decarbonisation and provide sustainable economic development for the community and the country. It will result in the cessation of the 'Do Nothing Scenario' industrial GHG emissions of approximately 215,900 tCO<sub>2</sub> during peak production, and significant Sulphur Dioxide (SO<sub>x</sub>) and Nitrogen Dioxide (NO<sub>x</sub>) emissions from the site. This will have a significant effect on climate and air quality pollution by reducing SO<sub>x</sub> and NO<sub>x</sub> emissions (which can react to generate N<sub>2</sub>O which has a far higher GWP than CO<sub>2</sub>).

The 'Do Nothing Scenario' industrial GHG emissions (215,900 tCO<sub>2</sub>) equates to 5% of the emissions ceiling for industry in 2030 (carbon budget 4 MtCO<sub>2</sub>).

In the first step towards decarbonisation, the Proposed Development will achieve the avoided or displaced GHG emissions in the year 2030 of approximately 150,000 tCO<sub>2</sub> or a 70% reduction due to the change of activities on the site from the production of magnesia products to a conventional DC importing 100% of its energy requirement from the grid. In this scenario, the Proposed Development would generate 66,300 tCO<sub>2</sub> which equates to 2% of the emissions ceiling for industry in 2030 (carbon budget 4 MtCO<sub>2</sub>). This is the impact of the Proposed Development prior to the mitigation measures included as the second and third step towards decarbonisation.

In the second step towards decarbonisation, the inclusion of the on-site assets (solar PV panels, batteries, and gas engines) in the Proposed Development to supply some power to the DC will result in maximum GHG emissions of approximately 51,903 tCO<sub>2</sub> in the year 2030. This will achieve a 76% reduction in GHG emissions from the 'Do Nothing Scenario' emissions (215,900 tCO<sub>2</sub>) and a 22% reduction in GHG emissions would be generated if all electricity required for operation of the DC was imported from the grid (66,300 tCO<sub>2</sub>). It is noted that this is the maximum estimated figure for total GHG emissions from the Proposed Development as it represents the minimum use of the proposed on-site assets of the solar PV array, batteries and gas engines fuelled by natural gas.

This worst case figure for total GHG emissions from the operation of the Proposed Development (51,903 tCO<sub>2</sub>) equates to 1% of the emissions ceiling for industry in 2030 (carbon budget 4 MtCO<sub>2</sub>).

In the third step towards decarbonisation, the implementation of a wind PPA by the DC tenant alongside the use of the on-site assets in the Proposed Development to supply some power to the DC will result in maximum GHG emissions of approximately 17,750 tCO<sub>2</sub> in the year 2030. This will achieve a 92% reduction in GHG emissions from the 'Do Nothing Scenario' emissions (215,900 tCO<sub>2</sub>) and a 73% reduction in GHG emissions would be generated if all electricity required for operation of the DC was imported from the grid (66,300 tCO<sub>2</sub>). The implementation of a wind PPA will be a requirement of the tenancy at the campus. In this case, the total GHG emissions from the

operation of the Proposed Development (17,750 tCO<sub>2</sub>) equates to 0.4% of the emissions ceiling for industry in 2030 (carbon budget 4 MtCO<sub>2</sub>).

The implementation of these various mitigation steps as part of the site's decarbonisation pathway show significant reductions in GHG emissions which can be achieved by the use of the on-site assets in a flexible demand response compared to importing electricity from the grid.

The Proposed Development operations will allow the DC to be more energy efficient than conventional DCs through the follows design measures:

- **Electrical Performance:** The proposed CORE EC is to be configured as a medium voltage 10 kV network; allowing all generation, storage and power conditioning to take place more efficiently at this higher voltage. Paralleling of these systems allows for more efficient distribution of DC Information Technology (IT) power to servers with less stranding of the loads.
- **Thermal Performance:** The more impactful measure of energy efficiency relates to the DC cooling. For this aspect, the proposed cooling tower system which employs dry cooling for most of the year and water-based evaporative cooling during peak summer temperatures will allow more efficient cooling and is reflected in a lower Power Utilisation Effectiveness (PUE).
- **Onsite Renewable Electricity:** The proposed campus maximises on-campus solar generation on building roofs and facades; and pockets of land not suitable for development (Landfill and capped Stockpile 3).

As demonstrated in this Section, the Proposed Development is firmly aligned with national and local policy including the Climate Action and Low Carbon Development (Amendment) Act 2021, CAP24, Ireland's Long Term Strategy on GHG reductions 2024, the NAF, Ireland's national climate objective, and the LCDP 2021 - 2027. This is because the proposed infrastructure has been designed to achieve low to no carbon power consumption in real-time allowing PPL to become a leader in industrial decarbonisation. The Proposed Development will have a positive effect in helping Ireland to reduce GHG emissions in both the Industry and Electricity sectors.

Therefore, using significance levels as per Table 12.7 of this Chapter, the significance of operational GHG emissions from the Proposed Development is considered as '*negligible*' and therefore '*not significant*'. A project with '*negligible*' effects has: GHG impacts which are mitigated beyond design standards, gone well beyond existing and emerging policy requirements; and is well '*ahead of the curve*' for Ireland's trajectory towards net zero.

### 12.9.2 Climate Change Resilience Assessment

Climate resilience for the operational phase of the Proposed Development has been assessed in the form of a Climate Change Resilience Risk Assessment which can be found in Appendix C of this EIAR.

The risk assessment identifies project specific climate risks, considers the implications for the buildings and workers; spaces; infrastructure; services and biodiversity, sets out the magnitude of this risk, and measures which have been adopted in the design of the Proposed Development to avoid or reduce these risks, where applicable.

A summary of the risk assessment including the net risk for identified hazards is included in Table 12.13.

**Table 12.13:** Summary of Climate Resilience Risk Assessment

| Risk ID No. | Climate Hazard | Net Risk<br><i>Refer to Likelihood and Severity Categories and Risk Matrix</i> |                              |                 |
|-------------|----------------|--------------------------------------------------------------------------------|------------------------------|-----------------|
|             |                | Likelihood (L)                                                                 | Magnitude of consequence (M) | Risk Rating (R) |

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| Risk ID No. | Climate Hazard                                           | Net Risk<br><i>Refer to Likelihood and Severity Categories and Risk Matrix</i> |                              |                 |
|-------------|----------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------|-----------------|
|             |                                                          | Likelihood (L)                                                                 | Magnitude of consequence (M) | Risk Rating (R) |
| 1.          | Extreme Heat / Increasing Temperatures                   | 2                                                                              | 2                            | Low             |
| 2.          | Extreme Cold / Low Temperatures                          | 2                                                                              | 2                            | Low             |
| 3.          | Flooding / Increases in Rainfall                         | 2                                                                              | 2                            | Low             |
| 4.          | Decreases in Rainfall / Drought                          | 2                                                                              | 2                            | Low             |
| 5.          | Extreme Wind / Increase in Storm Intensity and Frequency | 2                                                                              | 2                            | Low             |
| 6.          | Sea Level Increases                                      | 2                                                                              | 2                            | Low             |
| 7.          | Biodiversity Loss                                        | 2                                                                              | 2                            | Low             |

As demonstrated in Table 12.13, the net risk for identified hazards in the climate resilience risk assessment is considered to be low for all climate hazards following the integration of controls in the design of the Proposed Development where relevant to mitigate climate variable risk. The Proposed Development meets the requirements of national and local policy regarding climate adaptation and resilience as set out in the NAF and LCDP 2021 - 2027.

Therefore, it is considered that the impact of climate change on the operational phase of the Proposed Development will be neutral, non-significant and long-term in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance.

## 12.10 Potential Decommissioning Effects

### 12.10.1 GHG Assessment

The design life for the proposed facility is considered to be in the order of 60 years.

Individual plant components will be upgraded or replaced as required during this time and these could extend the operational life of the facility substantially longer. Given its location and the pattern of development in the area, it is reasonable to assume the lands will continue to provide employment based land uses well beyond the design life of the Proposed Development. These could be in the form of continuance as a DC and EC facility or adaption to some other form of high-technology industrial or employment based activity. It is not possible to accurately predict what future long-term changes and or which adaptations would occur at the site.

It is considered decommissioning would be undertaken in a timeframe and scale similar to that of the construction activities. However, there will be no embodied carbon emissions associated with decommissioning, only potential GHG emissions associated with the decommissioning activities on site and that of the waste materials generated.

Appropriate disposal of waste materials will be based on relevant waste management legislation in place at that time and will follow the waste management hierarchy as Irish Governments move towards a circular economy in order to ensure GHG emissions from the waste are minimised as much as possible.

Decommissioning will be undertaken in compliance with relevant national and local climate policy at the time.

Based on the above, it is considered that the potential GHG emissions to be generated from the decommissioning of the Proposed Development will be 'negligible' and therefore 'not significant' in accordance with the IEMA (2022) Guidance significance criteria set out in Table 12.7 of this Chapter.

### 12.10.2 Climate Change Resilience Assessment

Key works required in the event of the Proposed Development being entirely decommissioned include:

- All above ground structures and equipment will be dismantled and removed from site, with the area substantially reinstated and the site will be rendered safe with regards to the potential for environmental pollution.
- Concrete sumps/foundations and underground cables will likely remain in-situ as there would be more of an environmental impact in their removal.

Decommissioning activities will be somewhat similar to the construction activities but will not involve excavation or in-ground works.

Receptors including the construction workforce, equipment, vehicles, materials and workplace may be vulnerable to a range of climate risks during the decommissioning phase. Examples of these climate risks include:

- Health and Safety risks to workforce in severe weather events;
- Obstruction of access to the construction site due to consequences of a severe weather event (storms, flooding, snow, ice);
- Delays caused by unsuitable conditions for certain construction activities due to extremes of hot, wet or cold weather;
- Damage of construction equipment, plant, materials and temporary construction buildings/facilities due to stormy weather.

The above climate change resilience effects during decommissioning are expected to be potentially negative but imperceptible and short term in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance. They will be managed by the Construction Management Team with appropriate measures as dictated by weather forecasts during the decommissioning phase.

## 12.11 Mitigation Measures and Monitoring

### 12.11.1 Construction Phase

#### Embodied Carbon Mitigation Measures

Following the LETI (2020) Guidance, the approach for the Proposed Development has considered and will continue to implement the following six key aims in relation to reducing embodied carbon:

- Build less: Refurb and re-use
- Build light: Consider the building structure.
- Build wise: Longevity and local context.
- Build low carbon: Review material specifications.
- Build for the future: Assess end of life and adaptability.
- Build collaboratively: Involve the whole team.

The Proposed Development has focused on retention of existing buildings and infrastructure on site where possible including the Workshop Building, 3 no. silos, Partial Crane Shed, seawater tanks and existing pump houses. This has resulted in saving of carbon emissions which would have been generated from complete demolition of the existing site and construction of new



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buildings/infrastructure. This will result in significant carbon savings which are not quantified within this Chapter.

A number of carbon reduction strategies have been incorporated into the design of the Proposed Development as detailed in Section 12.4.1 of this Chapter. The strategies relate to concrete specification, steel rebar and structural steel enhancements, and PV panel recycled content.

The energy consumption associated with the construction phase of the Proposed Development will be minimised through the implementation of energy conservation measures where possible.

Contractors will be required to complete; pre-construction checks on vehicles; pre-start checklists for daily checks; and service of plant and machinery to ensure there is no excessive pollution from plant and machinery.

The construction project contractor will operate a continuous incentive scheme to encourage car-pooling and lift sharing by all construction staff, with eligibility for the incentive scheme based on a minimum vehicle occupancy rate of two construction staff per vehicle.

### **Embodied Carbon Monitoring**

As the design of the Proposed Development progresses, ongoing monitoring and optimisation of embodied carbon emissions will be implemented to ensure continued alignment with the projects carbon reduction goals and industry standards. The procurement stage has a very big influence on the actual embodied carbon impacts arising from the development, and therefore extra care should will be given to this stage. The procurement stage will focus on implementing the following elements:

- Responsibly sourced materials with certificates to prove their sustainable supply chain credentials;
- Materials with higher recycled content;
- Any re-useable/repurposed materials;
- Favouring products with Environmental Product Declarations (EPDs) to allow a clear comparison between different products, giving priority to products with a lower embodied carbon impact.

Contractors will be required to monitor and report energy usage during construction including fuel, water, and transport emissions for materials and staff commuting to and from the site.

### **Climate Change Resilience Assessment Mitigation Measures**

Climate change resilience impacts during the construction phase are expected to be short-term and negligible if correctly managed by the Construction Management Team with appropriate measures as dictated by weather forecasts during the construction phase. Examples of these measures include:

- Restricting access to site or working hours due to a severe weather event (storms, flooding, snow, ice);
- Postponement of planned activities during unsuitable conditions for certain construction activities due to extremes of hot, wet or cold weather.
- All contractors must have an Environmental Management System (EMS) in place which will consider all measures deemed necessary to manage extreme weather events.
- All contractors must have emergency preparedness and contingency procedures in place for an extreme weather event on the construction site or within the supply chain as appropriate.
- All construction method statements must consider extreme weather events as appropriate.

### **Climate Change Resilience Assessment Monitoring**

No specific monitoring is proposed at this time as mitigation measures for climate hazards will only be implemented in a severe weather event.

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### 12.11.2 Operational Phase

#### Operational Carbon Mitigation Measures

The mitigation measures implemented to ensure minimal generation of GHGs from the operation of the Proposed Development are included as part of the design of the proposed energy infrastructure at the site and are described in detail under Section 12.2.2 and 12.9.1 of this Chapter.

These sections include details on the measures included in the design of the Proposed Development with the aim of achieving net-zero emissions on an hourly basis.

In addition, an Energy Use Intensity (EUI) reduction, in comparison to the Building Regulations (Part L Amendment) Regulations (S.I. No. 538 of 2017), is being targeted for the Data Centre.

The total rated thermal input ( $MW_{th}$ ) from the proposed gas engines will exceed  $20 MW_{th}$  and therefore the CORE campus will require a GHG permit which will control the emissions of  $CO_2$  from this plant under the European Commission (EC) (Greenhouse Gas Emissions Trading) Regulations 2012, (S.I. No. 490 of 2012) and amending Regulations.

In addition, the following measures are included in the Proposed Development in relation to reducing water usage and therefore mitigating carbon emissions from water usage:

- Use of dry cooling for most of the year and water-based evaporative cooling only during peak summer temperatures allows for a more efficient cooling system contributing to reduction in freshwater use;
- Existing freshwater abstraction point from Littlegrange/Mell Quarry will be utilised for Fire Water supply and DC Cooling on site;
- The proposed Landscape Plan includes planting that does not require irrigation systems post establishment;
- Low flow and flush fixtures and fittings will be included during detailed design stages for the Proposed Development.

#### Operational Carbon Monitoring

- As a GHG permit holder, PPL will be required to monitor GHG emissions generated from the operation of the proposed gas engines at the site and report this on an annual basis to the EPA;
- > 90% of regulated energy use will be targeted to be metered. The remaining quantity of energy consumed will be monitored;
- Estimated energy consumption of each fuel will be identified, with 100% of all fuel types being continually monitored in real time;
- Unregulated energy such as this will form part of the overall energy campus efficiency.
- Water usage during the operation of the Proposed Development will be monitored through water metering.

#### Climate Change Resilience Assessment Mitigation Measures

The Climate Change Resilience Risk Assessment will be reviewed and updated as necessary to include any additional design-related adaptation measures that have been implemented.

#### Climate Change Resilience Assessment Monitoring

The Climate Change Resilience Risk Assessment will be reviewed and updated as necessary to ensure that any design-related adaptation measures have been implemented.

### 12.11.3 Decommissioning Phase

No mitigation measures are proposed for the decommissioning phase at this time.

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## 12.12 Potential Residual Effects

### 12.12.1 Construction Phase

The mitigation measures outlined in Section 12.11.1 ensure the development contributes positively to the achievement of the key targets for the Industrial Sector from CAP24 to decrease embodied carbon for materials produced and used in Ireland as it will create a demand for lower carbon materials thereby encouraging producers to work towards the supply of such materials.

As the design of the Proposed Development progresses, the Design Team will explore alternative options aimed at enhancing efficiency, such as minimising the use of materials in the building. This approach will render the building more environmentally friendly and further mitigate the carbon emissions associated with its development.

However, given the current estimated embodied carbon associated with the Proposed Development, the residual effect on climate change from the Proposed Development is deemed to be '*minor adverse*' and therefore '*not significant*' in accordance with the criteria outlined in Section 12.4.1 '*GHG Significance Criteria*' of this Chapter.

### 12.12.2 Operational Phase

The mitigation measures implemented to ensure minimal generation of GHGs from the operation of the Proposed Development are included as part of the design of the proposed energy infrastructure at the site and are described in detail under Section 12.2.2 and 12.9.1 of this Chapter.

With the implementation of the mitigation/offsetting of carbon emissions as set out in Section 12.9.1 of this Chapter, the residual effect of the operational phase of the Proposed Development would be '*negligible*' and therefore '*not significant*' in accordance with the criteria outlined in Section 12.4.1 '*GHG Significance Criteria*' of this Chapter. A project with '*negligible*' effects has: GHG impacts which are mitigated beyond design standards, gone well beyond existing and emerging policy requirements; and is well '*ahead of the curve*' for Ireland's trajectory towards net zero.

In addition, the IEMA (2022) Guidance<sup>159</sup> states:

*"Where there is embedded mitigation in the form of project commitments to GHG reductions but the details are not secured within the project design at the time of assessment, further detail of the potential mitigation measures to achieve that commitment can also be considered within the additional mitigation section and assessment of residual effects."*

Future mitigation measures envisaged for the campus as outlined in Figure 12.4 include the use of biomethane or hydrogen to fuel the gas engines at the campus as described in Section 8 of the *Energy and Emissions Modelling Report* which accompanies this planning application. The proposed CORE EC is equipped with reciprocating gas engines that have been tested and proven to run on natural gas, biomethane or hydrogen to future-proof the proposed infrastructure for the future scenarios when these clean fuels can be obtained.

These measures are described in detail in the Emissions and Energy Report. An overview is provided here.

It is noted that these future measures are not relied on in the climate impact assessment for the Proposed Development as set out in Section 12.9.1 of this Chapter.

#### Mitigate through displacement of natural gas with biomethane

The remaining GHG emissions generated by the operation of the gas engines at the Proposed Development in Step 3 (from Figure 12.4, as described in Section 12.9.1) can be further mitigated or offset by the replacement of natural gas fuel in the gas engines with use of biomethane. As biomethane is a carbon neutral fuel<sup>160</sup>, this would eliminate the remaining GHG emissions associated with running the gas engines.

<sup>159</sup> Institute of Environmental Management & Assessment (IEMA) (2022) "*Guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance*"

<sup>160</sup> Biomethane is considered a carbon neutral fuel because it is produced from feedstocks that absorb CO<sub>2</sub> as they grow.

While the occupier will be required to engage in a wind / solar PPA in respect of the Proposed Development, in line with the Government Statement on Data Centres, it will be a commercial decision for campus tenants whether (or when) they are willing to pay a premium for biomethane over natural gas. Some tenants may wish to, and be prepared to mitigate all their emissions by 2030, others may be satisfied to partially mitigate in the interim and achieve 100% by 2040 or 2050. The increasing cost of voluntary carbon credits and future updates in government climate policy associated with achieving future further reduced carbon budgets will further incentivise and influence tenants to avail of this and other measures made available at the site.

Full mitigation of emissions from the operation of the gas engines with indigenous biomethane will be made possible through PPL's collaboration with a local supplier to ensure biomethane gas resources sufficient to fully decarbonise gas engine operation will be available at the site. There are also other options where cheaper biomethane can be purchased on the European Gas grid.

The breakdown of emissions reductions possible compared to the emissions associated with importing 100% of the required electricity from the grid in the year 2030 is given below as the focus year for the operational carbon assessment. Figure 12.8 also illustrates the energy modelling results for future years in the decarbonisation journey for the Proposed Development with the use of the proposed on-site energy infrastructure, the incorporation of a 60 MW wind PPA and the use of biomethane to fuel the gas engines.

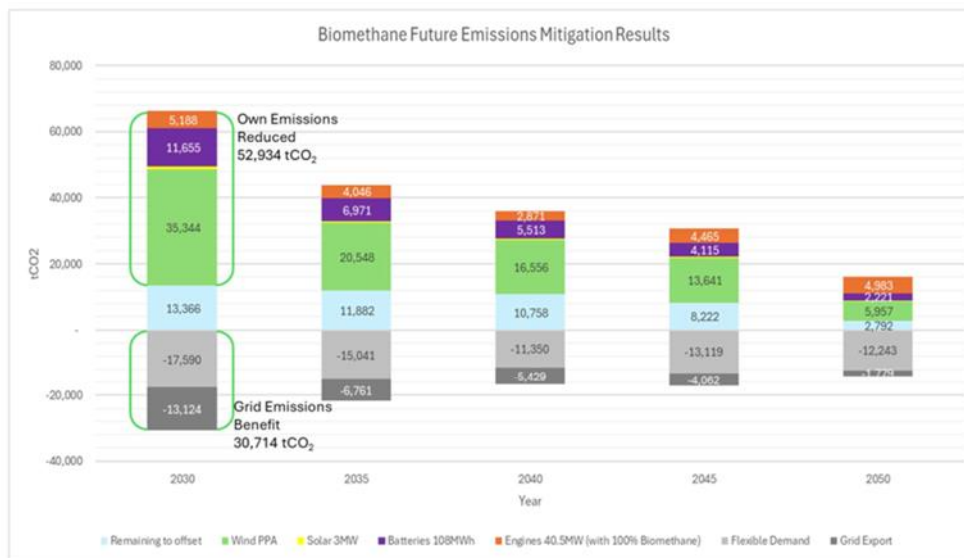


**Figure 12.8:** Reduction in GHG Emissions at the PPL Site Possible Through Use of On-Site Assets as part of the Proposed Development and Biomethane PPAs to fuel the Gas Engines

#### Flexible Demand Response - Own Emissions Reduction

In this model, the parameters for load, grid intensity, solar, batteries, and the 60 MW wind PPA remain as per described in Step 3.

In the year 2030, the model predicts that the use of the batteries will store and discharge 26,093 MWh of electricity and displace 11,655 tCO<sub>2</sub> of grid GHG emissions. The use of the solar PV array will generate 2,794 MWh electricity and displace 747 tCO<sub>2</sub> GHG emissions that would have been produced if this electricity was consumed 100% from the grid. The model also includes the use of the 60 MW Wind PPA described in step 3 which will provide 144,369 MWh and will displace 35,344 tCO<sub>2</sub> grid emissions.

**Gas Engines Using Biomethane:** In the year 2030, the operational hours for the gas engines are kept the same as Step 3 at 457 hours. Based on these running hours the gas engines would produce 9,772 MWh of electricity for the DC. The addition of the biomethane PPA to supply all of the fuel for the gas engines reduces the emissions related to the running of the gas engines to zero tCO<sub>2</sub>. This achieves a total displacement of 5,188 tCO<sub>2</sub> grid emissions – made up of an

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804 tCO<sub>2</sub> reduction in emissions from using the gas engines vs. importing electricity from the grid (as per Step 3) and a further 4,384 tCO<sub>2</sub> reduction in emissions from using biomethane as fuel for the gas engines instead of natural gas.

#### **Remaining to Offset:**

Combined, the use of the on-site assets (solar PV array, batteries and gas engines fuelled by biomethane) as well as a 60 MW PPA for grid imports will supply 183,028 MWh to the DC and gives a total reduction of GHG emissions of 52,934 tCO<sub>2</sub> (80% reduction) compared to the that which would be associated with 100% electricity grid imports alone (66,300 tCO<sub>2</sub>).

This leaves 13,366 tCO<sub>2</sub> from emissions associated with the electricity imported from the grid on site to be further mitigated or offset.

#### **Grid Emissions Benefit**

The **light grey** section of the bars in Figure 12.8 represents the flexible demand from the grid's perspective where the grid did not have to produce energy as it was generated and/or stored by the on-site assets at a lower carbon intensity than that of the grid (as described in the section above). This accounts for a 17,590 tCO<sub>2</sub> reduction compared to emissions that would have been produced if this power came from 100% electricity grid imports.

Additionally there is a potential further reduction of 13,124 tCO<sub>2</sub> on the grid represented by the **dark grey** as a result of the possible export of surplus lower carbon electricity onto the grid from batteries (7,835 MWh exported giving a 3,500 tCO<sub>2</sub> reduction) and the potential export of surplus wind energy (39,312 MWh exported giving a 9,624 tCO<sub>2</sub> reduction). While the gas engines fuelled with biomethane could be used to export decarbonised power to the grid in this scenario also, this is not projected to be viable because the projected high price of biomethane means that it would not be expected to be possible to produce energy at a price that would be competitive on the Irish single electricity market (ISEM).

Therefore the potential total benefit of reduced GHG emissions on the grid as a result of the flexible demand response and possible export of power from the Proposed Development is 30,714 tCO<sub>2</sub> pending further steps on the decarbonisation pathway as detailed in Section 8 of the Energy and Emissions Monitoring Report which accompanies this planning application.

#### **Mitigation through displacement of natural gas with hydrogen**

As the energy transition in Ireland progresses towards 2050 there is the potential for hydrogen to become part of the fuel mix within the national gas grid and as such the emissions intensity of the gas in the grid will reduce. As the use of biomethane will be a commercial decision made by the tenant the mix of fuel used in the gas engines is not set at this stage but the inclusion of hydrogen in the grid gas mix offers a further opportunity for the decarbonisation of the operation of the gas engines.

#### **Potential Future Phases of CORE**

Given the upgrade plans for existing infrastructure at the site, alongside the integration of renewable energy sources and advanced energy storage systems via the proposed EC, it is envisaged that the site will be able to accommodate LEUs such as further DCs on the electrical side and Food/Beverage/Biopharma on the thermal side. A new ring main will be constructed in order to provide a gas supply to the EC included in the Proposed Development for the engines via a manifold.

CORE will have significantly decarbonised (trending towards fully decarbonised) electrical and heat networks. Coupled with PPL's private water systems, the Proposed Development will ensure that new industry can be attracted to Drogheda to support sustainable economic growth.

The following mitigation measures are envisaged for the campus in future phases of the CORE development which will be subject to planning permission:



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### **Mitigation through the reuse of waste heat generated on-site in heat networks**

Another key decarbonisation feature of the Proposed Development is the possible reuse of waste heat as low/medium temperature hot water for future tenants. The Proposed Development includes for the construction of the base infrastructure to allow this. However, it cannot be utilised until there are future tenants which are industrial heat-users on the site and/or a local district heat system has been developed.

It is considered that this will be a much more cost-effective method of decarbonising than switching to biomethane alone for the following reasons:

1. A lower gas engine emissions profile will enable them to run for more hours of the year (even on natural gas) allowing them to displace more grid emissions, more often.
2. DC waste heat is already fully decarbonised and therefore if use is made of this waste heat then it will have a substantial potential to offset the remaining GHG emissions from the operation of the Proposed Development.

It is not possible to model these future scenarios envisaged without knowing the heat-use and characteristics of the thermal consumers. However it is clear that these options would significantly decarbonise the operations of future thermal energy users.

### **Mitigation through additional solar development**

There is abundant space within the PPL site for additional solar PV arrays.

It is envisaged that when private wire systems<sup>161</sup> become possible in Ireland, there will be a strong potential to increase the solar PV arrays (subject to further planning permission) at the site.

## **12.12.3 Decommissioning Phase**

No residual impacts are foreseen for the decommissioning phase at this time.

## **12.13 Difficulties Encountered During Preparation of this Chapter**

There were some difficulties encountered when preparing this Chapter due to unavailable information at this stage of the design process. These are described under Section 12.5 of this Chapter.

Due to the stage of design of the Proposed Development, data utilised in the GHG assessment are conservative estimates. It is important to note that further embodied carbon minimisation may be possible as the design of the Proposed Development progresses.

There are inherent uncertainties included in the energy modelling also related to future carbon intensity of the grid. These are described in detail within the Energy and Emissions Modelling Report which accompanies this planning application.

<sup>161</sup> Localised electricity grids connected to the local distribution networks but linked to privately-owned central plant which produces electricity.

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## 13 Waste Management

### 13.1 Introduction

This Chapter has been prepared to assess the potential for effects in relation to waste management as a result of the Proposed Development during the construction and operational phases at the Premier Periclase Ltd. (PPL) Site at Boyne Avenue, Newtownstalaban, Drogheda, Co. Louth. Due to the interconnectivity of environmental factors, this chapter should be read in conjunction with *Chapter 2 Description of Proposed Development*, *Chapter 7 Soils, Geology and Hydrogeology* and *Chapter 10 Water and Wastewater*. An Outline Resource and Waste Management Plan has been prepared for the Proposed Development and accompanies this planning application (PM Group Report No. IE0313391-22-RP-0004).

This chapter describes the following:

- Materials currently on the PPL site that will become waste and will require removal from the site if the Proposed Development is approved and existing production processes are terminated;
- The waste that is expected to result from the construction phase of the Proposed Development, including the demolition of the existing site structures, and how this waste will be managed;
- An appraisal of wastes likely to arise during the operation of the Proposed Development.

Based on the results of the assessment, the necessary mitigation measures to minimise and where possible eliminate any potential effects are described.

### 13.2 Assessment Methodology

#### 13.2.1 Relevant Guidelines, Policy and Legislation

This Chapter was prepared noting the methodologies specified in the appropriate Environmental Protection Agency (EPA) and EU guidance documents referenced in Section 1.9.1 of this EIAR, including those listed below, to assess the effects of the demolition, construction and operational waste management of the Proposed Development:

- EPA (2022) *“Guidelines on the Information to be Contained in Environmental Impact Assessment Reports”*;
- European Commission (2017) *“Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report”*.

Relevant policies, legislation and best practice guidelines have been reviewed to identify current and future requirements for waste management. These include:

- Louth County Council (2024) *“County Louth Development Plan 2021-2027, incl. Variations 1 & 2”*;
- Meath County Council (2024) *“Meath County Development Plan 2021-2027 (incl. Variations 1 & 2)”*;
- Government of Ireland (2020) *“A Waste Action Plan for a Circular Economy, Ireland’s National Waste Policy 2020-2025”*;
- Regional Waste Management Planning Offices (2024) *“National Waste Management Plan for a Circular Economy 2024-2030”*;
- Relevant waste management legislation including:
  - *Waste Management Act 1996 (S.I. No. 10 of 1996) (as amended)*;
  - *European Union (Waste Electrical and Electronic Equipment) Regulations 2014.(S.I. No. 149 of 2014)*;
  - *The Circular Economy and Miscellaneous Provisions Act 2022 (S.I. No 26 of 2022)*;

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- *Waste Framework Directive (2008/98/EC) (as amended);*
- *Litter Pollution Acts of 1997 to 2009.*
- *EPA National Waste Database Reports;*
- *EPA (2019) "Waste Classification List of Waste & Determining if Waste is Hazardous or Non-hazardous";*
- *EPA (2021) "National Hazardous Waste Management Plan 2021 – 2027";*
- *EPA (2003) "EPA Landfill Manual for Landfill Monitoring",*
- *Codes of Practice and Guidelines to include:*
  - *EPA (2021) "Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition ";*
  - *CIRIA (2007) "Reuse of Foundations (C653)";*
  - *CIRIA (2003) "Infrastructure embankments –condition, appraisal and remediation (C592)";*
  - *CIRIA (1999) "Waste minimisation and recycling in construction (PR28)";*
  - *CIRIA (2001) "Control of Water Pollution from Construction Sites (C532)";*
  - *CIRIA (2024) "Environmental Good Practice on Site (C811)";*
  - *Inland Fisheries Ireland (2016) "Guidelines on Protection of Fisheries during Construction Works and Adjacent to Waters".*

### 13.2.2 Sources of Information

Sources information was various sources to include reports as detailed below and discussions with various stakeholders who have specific knowledge. In addition calculations to estimate volumes of material arising from the different phases where based on approved models also detailed.

Baseline information was sourced from:

- PPL Waste supplied information;
- PPL (2015) *"Annual Environmental Report 2014"*;
- PPL (2024) *"Annual Environmental Report 2023"*;
- Phoenix Environmental Safety Ltd. (2023) *"Asbestos Survey Report (Refurbishment / Demolition Survey)"*;
- Building Research Establishment (BRE) Waste Benchmark Data;
- BRE Smartwaste Benchmark Data;
- AtkinsRéalis (2024) *"Tier 2 Generic Quantitative Risk Assessment Report (GQRA)"*;
- Outline Demolition Arising Estimate by AtkinsRéalis;
- Cut and Fill Estimates provided by AtkinsRéalis;
- AtkinsRéalis (2024) *"Demolition Management Plan"*.

### 13.3 Receiving Environment

National and EU legislation is in place governing the treatment and disposal of waste nationally. The primary national waste legislation in Ireland is the Waste Management Act 1996 (as amended). The primary EU waste legislation is the Waste Framework Directive 2008 (as amended).

*A National Waste Action Plan for a Circular Economy, Ireland's National Waste Policy 2024-2030* was published by the Regional Waste Management Planning Offices in 2024; this follows on from Ireland's previous waste policy – *A Waste Action Plan for a Circular Economy Policy 2020-2025*

and *A Resource Opportunity 2012*. The Waste Action Plan continues to emphasise the need to move away from waste disposal and preserve resources, to move towards a circular economy. The Waste Action Plan sets out a singular national plan that all local authorities will be a party to, moving away from three individual action plans of the three Waste Enforcement Regional Lead Authorities (WERLAs).

This Plan recognises Climate Change as a key driver for both behavioural change and improved waste management practices. The Plan will be evaluated annually for climate impact and annual work plans will be adapted to respond to the climate challenge.

Construction and Demolition (C&D) Waste is recognised as the largest waste stream in the EU, representing a third of all the waste produced. 80% of these wastes come from excavated soil and stone, with the remainder including concrete, brick, tile, glass, wood, plastic and metal. The Plan sets out that the C & D sector needs to promote waste prevention, follow best available techniques, expand the range and use of recycled products, create a market demand for recycled products, segregate materials on-site for recycling and meet the target of preparing for reuse, recycling and other material recovery of 70% by weight of non-hazardous C & D waste excluding natural soil and stone.

The Plan's ambition is 0% total waste growth per person over the life of the Plan, with an emphasis on non-household wastes, including waste from commercial activities and the construction and demolition sector.

The Plan aims to influence sustainable consumption, prevent the generation of waste and improve the capture of materials to optimise circularity and enable compliance with policy and legislation.

### 13.3.1 Current Status of PPL Operation

As discussed in Section 1.6.3 of this EIAR, thermal operations onsite have been scaled back as the current planning application is prepared; however the production of Magnesium Hydroxide (ECOMAG) is continuing.

Condition 2 of its Industrial Emission licence (P0376-02) obliges PPL to maintain an Environmental Management System (EMS). The Standard Operation Procedures (SOP) of that EMS include:

- The classification of wastes and maintenance of a waste inventory,
- The proper management of wastes onsite including proper handling, labelling, inspections and treatment,
- The use of qualified personnel for waste shipments,
- The establishment of waste minimisation programs,
- The completion of training consistent with waste prevention and management of work performed,
- The completion of an overall programme evaluation and to maintain records,
- The establishment of programs to minimise waste in compliance with regulatory and permit requirements.

PPL's Standard Operating Procedures (SOPs) also describe the responsibilities of the different roles involved in waste management.

### 13.3.2 Current Waste Management Logistics and Profile

The PPL Waste Management Procedure (see Attachment 13.1 to this EIAR) sets out the steps and procedures for the appropriate management of waste onsite.

Segregation is carried out at source. Inert waste from production which includes Lime Dust, Slaker Grits and other inert waste is disposed of in the licenced landfill on site. Other wastes that are not licenced for landfilling on site are, where possible sent for recovery or recycling to a licenced contractor.

The PPL Environmental Manager is responsible for maintenance of all waste management and documentation. This includes waste container, tracking forms, waste inventory data and waste shipment documentation.

The wastes that are expected to remain on the PPL site if planning permission for the Proposed Development is granted and operations on site cease are summarised below. Non-hazardous waste streams are summarised in Table 13.1 and hazardous waste streams are summarised in Table 13.2.

Given the number of various waste streams, only waste where the quantity exceeds five metric tonnes of non-hazardous waste are reported in Table 13.1. In addition to the quantities of non-hazardous waste reported in Table 13.1, there is an additional ca. 25 tonnes of waste in small parcels with numerous list of waste codes to be disposed of.

Similarly, only hazardous waste greater than one metric tonne in weight is reported in Table 13.2. There is also an additional ca. 6 tonnes of hazardous waste in small parcels with numerous waste codes to be disposed of.

**Table 13.1:** PPL Non-hazardous Waste at Cessation of Production

| Waste Stream                  | LoW Code | Weight in Tonnes | Waste Management Practice                                      | Current Handling, Storage & Location                                     |
|-------------------------------|----------|------------------|----------------------------------------------------------------|--------------------------------------------------------------------------|
| Fibreglass                    | 10 11 03 | 2                | Inorganic substance recycling / Dispose of in offsite landfill | Collected site wide when requested. Stored in Waste Yard.                |
| Slaker Grits                  | 10 13 04 | 54               | Inorganic substance recycling / Dispose of in onsite landfill  | Collected site wide when requested. Disposed directly to onsite landfill |
| Lime Kiln Dust                | 10 13 05 | 175              | Inorganic substance recycling / Dispose of in onsite landfill  | Collected site wide when requested. Disposed directly to onsite landfill |
| Spent Refractory material     | 10 13 08 | 20               | Inorganic substance recycling / Dispose of in onsite landfill  | Collected site wide when requested. Disposed directly to onsite landfill |
| Sea Water Clarifier Underflow | 10 13 99 | 5,689            | Inorganic substance recycling / Dispose of in onsite landfill  | Collected site wide when requested. Disposed directly to onsite landfill |
| Reactor Grits                 | 10 13 04 | 5                | Inorganic substance recycling / Dispose of in onsite landfill  | Collected site wide when requested. Disposed directly to onsite landfill |
| Reject Lime                   | 10 13 04 | 547              | Inorganic substance recycling / Dispose of in onsite landfill  | Collected site wide when requested. Disposed directly to onsite landfill |
| Shaft Kiln Fines              | 10 13 05 | 1,219            | Inorganic substance recycling / Dispose of in onsite landfill  | Collected site wide when requested. Disposed directly to onsite landfill |



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| Waste Stream              | LoW Code | Weight in Tonnes | Waste Management Practice                                          | Current Handling, Storage & Location                                                    |
|---------------------------|----------|------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Half Burnt Limestone      | 10 13 05 | 6,755            | Inorganic substance recycling / Offsite landfill / Onsite Landfill | Collected site wide when requested.<br>Stored in Limestone intake Stockpile A           |
| Wood Packaging            | 15 01 03 | 11               | Recycle                                                            | Waste collected site wide in covered skips when requested. Stored in Waste Yard.        |
| Composite Packaging       | 15 01 05 | 4                | Recycle                                                            | Collected site wide when requested.<br>Stored in Pilot Plant.                           |
| Plastic and Rubber        | 19 12 04 | 29               | Recycle                                                            | Waste collected site wide.<br>Stored in Waste Yard.                                     |
| Paper and Cardboard       | 20 01 01 | 27               | Recycle – Disposed of by shredding                                 | Waste collected by the shredding company.                                               |
| Discarded Electrical      | 20 01 36 | 217              | Recycle                                                            | Collected site wide when requested.<br>Stored in WEEE Skips outside Electrical Workshop |
| Timber Non-Packaging      | 20 01 38 | 27               | Incineration on land offsite                                       | Waste collected site wide in covered skips when requested. Stored in Waste Yard.        |
| Mixed Municipal Waste     | 20 03 01 | 17               | Incineration on land offsite                                       | Collected site wide from bins when requested.                                           |
| Limestone                 | 01 04 08 | 1,121            | Inorganic substance recycling / Offsite landfill / Onsite Landfill | Collected site wide when requested.<br>Stored in Limestone intake Stockpile B.          |
| Mixed Demolition Waste    | 06 03 99 | 675              | Inorganic substance recycling / Dispose of in offsite landfill     | Collected site wide when requested. Stored in Waste Yard.                               |
| Titanium Oxide            | 06 11 99 | 9                | Inorganic substance recycling / Dispose of in offsite landfill     | Collected site wide when requested.<br>Stored in Pilot Plant                            |
| Filter Bags               | 15 02 03 | 10               | Incineration on land offsite                                       | Waste collected onsite in covered skip.                                                 |
| Magnesium Chloride Flakes | 16 03 04 | 25               | Inorganic substance recycling / Dispose of in offsite landfill     | Collected site wide when requested. Stored in Waste Yard.                               |

| Waste Stream       | LoW Code | Weight in Tonnes | Waste Management Practice                                                                      | Current Handling, Storage & Location                                          |
|--------------------|----------|------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Mixed Metal        | 17 04 07 | 2,903            | Recycled                                                                                       | Waste collected onsite in covered skip<br>Stored in Waste Yard                |
| Limestone Clay Mix | 01 04 12 | 15,899           | Inorganic substance recycling / Offsite landfill / Onsite Landfill<br>Use for Landfill Capping | Stockpile C retained for landfill capping – testing as per GQRA               |
| Petroleum Coke     | 05 01 16 | 42               | Organic substance / Incineration on land                                                       | Waste collected in Reject pet coke Area. Collected by Licensed waste carrier. |

**Table 13.2:** PPL Hazardous Waste at Cessation of Production

| Waste Stream         | LoW Code  | Weight in Tonnes | Waste Management Practice | Current Handling, Storage & Location                                                                                         |
|----------------------|-----------|------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Silica Fines         | 01 04 07* | 100              | Landfill                  | Stored in Silica Basin. Collected by Licensed waste carrier.                                                                 |
| Sodium Hydroxide     | 06 02 04* | 4                | Physicochemical treatment | Stored in Sodium Hydroxide Tank within Fresh Water and Acid Bund Area. Collected by Licensed waste carrier.                  |
| Sulphuric Acid       | 06 01 01* | 126              | Physicochemical treatment | Stored in Sulphuric Acid at process water basin and Wet end tank farm, Laboratory. Collected by Licensed waste carrier.      |
| Divasil              | 10 10 13* | 3                | Physicochemical treatment | Waste collected site wide in plastic drum as requested. Lower Stores Production Lockup. Collected by Licensed waste carrier. |
| Waste Oil/lubricants | 13 02 05* | 41               | Recycled for Fuel         | Waste collected site wide in plastic drum as requested. Stored in Bunds and Oil Store Collected by Licensed waste carrier.   |
| Diesel               | 13 07 01* | 6                | Use on Site               | In Diesel tanks for Emergency Diesel Generators. Collected by Licensed waste carrier.                                        |

| Waste Stream           | LoW Code  | Weight in Tonnes | Waste Management Practice | Current Handling, Storage & Location                                             |
|------------------------|-----------|------------------|---------------------------|----------------------------------------------------------------------------------|
| Oil                    | 13 07 03* | 4                | Recycled as Fuel          | Stored in Oil Store. Collected by Licensed waste carrier.                        |
| Heavy Fuel oil residue | 13 07 03* | 57               | Incineration on land      | Stored in old HFO tanks and infrastructure. Collected by Licensed waste carrier. |
| PCB (from Transformer) | 13 03 01* | 3                | Incineration on land      | Collected in labelled containers by licensed waste contractors.                  |
| Chromium Oxide         | 16 09 02* | 46               | Incineration on land      | Stored in Big bags in Pilot plant. Collected by Licensed waste carrier.          |
| Sodium Carbonate       | 06 02 05* | 21               | Incineration on land      | Stored in Big bags in Pilot plant. Collected by Licensed waste carrier.          |

\*Denotes Hazardous Wastes

A summary of the quantities of wastes generated for the year 2023 reflecting the scaled down operations is described in Table 13.3 (existing baseline scenario as described in Section 1.9.4 of this EIAR).

In addition, a summary of the quantities of wastes generated for the year 2014 reflecting the PPL site at peak operations is described in Table 13.4 (operational baseline scenario as described in Section 1.9.4 of this EIAR).

**Table 13.3:** Waste Generated at PPL site and Percentage Recovered/Recycled for the Year 2023 (Existing Baseline Scenario)<sup>162</sup>

| Waste Type    | Total in Tonnes | Recovered/ Recycled % | % Increase / Reduction on 2022 |
|---------------|-----------------|-----------------------|--------------------------------|
| Non-Hazardous | 1.08            | 45%                   | 82% decrease                   |
| Hazardous     | 11.94           | 65%                   | >100% increase                 |
| Inert         | 15.43           | 100%                  | 93% decrease                   |

**Table 13.4:** Waste Generated at PPL site for the Year 2014 (Operational Baseline Scenario)<sup>163</sup>

| Waste Type    | Total in Tonnes | Recovered/ Recycled % |
|---------------|-----------------|-----------------------|
| Non-Hazardous | 121.6           | 32%                   |
| Hazardous     | 6.05            | 100%                  |
| Inert         | 11,075          | 0%                    |

### 13.3.3 Existing On-site Landfill

The recovery and disposal of waste was initiated to deal with the waste arising from magnesia production in the early 1980s and the full breadth of activities for which PPL is currently licensed have been ongoing on a continuous basis at this site since 1981. No licence was attached to this landfill at that time.

PPL was granted an Integrated Pollution Prevention and Control (IPPC) Licence (Licence Reg. No. P0376-01) in 1999. A revised licence (Licence Reg. No. P0376-02) was issued on 4<sup>th</sup> July 2013. The Licence was amended to an Industrial Emissions (IE) Licence on the 6<sup>th</sup> of January 2014.

PPL's current licence (Reg. No. P0376-02) permits it to carry on the following activities:

- Class 10.3: Production of lime in kilns with a production capacity exceeding 50 tonnes per day.
- Class 11.5: Landfills, within the meaning of section 5 (amended by Regulation 11(1) of the Waste Management (Certification of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008 (S.I. No. 524 of 2008)) of the Act of 1996, receiving more than 10 tonnes of waste per day or with a total capacity exceeding 25,000 tonnes, other than landfills of inert waste.

Condition 7.6 of the original licence (P0376-01) was superseded by Condition 3.5.1 of the current licence (P0376-02) and requires PPL to maintain a Landfill Operation Plan. The purpose of the Landfill Operation Plan is to monitor, control and minimise the effects of landfill activities on the surrounding environment.

PPL prepared an initial Plan in 2007. This Plan was approved by the EPA. It is reviewed annually by PPL and reported to the EPA. The Plan states that only inert or inactive waste is to be placed in the landfill and that the lifespan of the landfill is 18.5 years from 2012. The Plan further details how the landfill is to be managed and the aftercare and monitoring regime that will be carried out during the operation of the landfill and on its final closure.

The landfill was the focus of a Tier 3 Investigation and Risk Assessment in 2014 that concluded that the landfill presented an insignificant risk to groundwater or other off-site surface waters. The latest ongoing Groundwater Monitoring Programme Report for the site<sup>164</sup> has confirmed the

<sup>162</sup> PPL (2024) "Annual Environmental Report 2023"

<sup>163</sup> PPL (2015) "Annual Environmental Report 2014"

<sup>164</sup> O'Callaghan Moran & Associates (2024) "Groundwater Monitoring Programme 2024, Premier Periclase Limited Drogheda County Louth"

findings of the 2014 investigation and states that *“based on all of the available information, there is no evidence to indicate that the PPL facility poses a significant risk to surface water groundwater receptors downstream or down hydraulic gradient of the facility”* and that *“there is no evidence of a significant contaminant plume emanating from the Landfill Area”*.

As part of the Proposed Development, it is intended to move stockpiles 1 and 2 to the landfill (further details provided in Section 2.6.4 of this EIAR).

The landfill will be capped with an impermeable membrane and approximately 1.8 m of material, with a minimum of 300 mm of topsoil, after the addition of inert material from stockpiles 1 and 2 and other inert wastes during construction phase of the Proposed Development. The landfill will then provide an ideal location to add additional solar array for the generation of renewable electricity.

### 13.4 Characteristics of the Proposed Development

The Proposed Development to which this planning application relates is the first phase of CORE, and will consist of extensive works that will transform the ca. 35.6 hectare site and set it on a path that will result in it becoming a sustainably powered enterprise campus. It is noted that the Proposed Development is unrelated to the existing Industrial Emissions licensed activity at the site. The Proposed Development consists of:

- The demolition of existing buildings, structures, and services associated with the PPL facility, as well as site clearance and remediation works.
- The careful sequestering of the licensed (inert) landfill onsite in accordance with all ongoing and future requirements of the EPA.
- A number of existing buildings and structures will be maintained as part of the Proposed Development, such as a Workshop Building, part of a Crane Store structure, 3 no. Lime Silos and water tanks and infrastructure, all of which have been incorporated into the design where beneficial and appropriate.
- The construction of a three storey Energy Centre (EC) building, a three storey Data Centre (DC) building, a single storey Facility Operations Centre (FOC) building, a single storey Pump and Filtration Building, a single storey Security Gatehouse and a Security Kiosk at the main site entrance of the site.
- The provision of a Battery Energy Storage System (BESS) Compound, an ESB Substation, a Cooling Compound, a Thermal Store Compound, a Pump and Filtration System, other ancillary structures including a Firewater Tank, a Fire Fighting Water Pump Building, a Control Building, a Maintenance Yard and Waste Management facilities. Ground-mounted solar Photo Voltaic (PV) arrays will also be provided on the existing licensed landfill and stockpile no. 3, along with 3 no. compact substations.
- The provision of all associated works including access arrangements, internal roadways and footpaths, car and cycle parking, boundary treatments, landscaping and services, and all ancillary works.

A detailed description of the Proposed Development is included in *Chapter 2 Description of Proposed Development* of this EIAR, which includes details of the demolition works required, details of the construction of the new buildings and structures, and details of the various elements that will make up the Proposed Development when it will be operational.

The following subsections provide details of the various phases of the Proposed Development with respect to waste management.

#### 13.4.1 Construction Phase (Including Demolition)

Before any transformation of the current PPL site into CORE can be achieved, a very significant demolition project must be undertaken. A Full Demolition Plan has been prepared for the Demolition of the existing structures. The planned demolition works are expected to take 14 months to complete.



Prior to undertaking demolition, the site must be cleared of all material and waste that is present on the site as discussed in Section 13.3. This will involve in the first instance the removal of all existing plant and equipment that will be sold on and/or recycled.

As discussed in *Chapter 2 Description of Proposed Development* of this EIAR, a refurbishment/demolition asbestos survey (RDAS) has been carried out for every structure to be demolished, which clearly identifies structures that contain asbestos materials. However, some buildings and structures were operational or live during the surveys and asbestos information could not be obtained for. These buildings and structures will require additional asbestos surveys to be carried out before any demolition works.

A competent contractor will remove all asbestos material identified onsite as per the pre-demolition asbestos survey carried by Phoenix Environmental Safety Ltd. (Attachment 13.2 of this EIAR<sup>165</sup>), including insulation within the fabric of the existing buildings.

According to the AtkinsRéalis GQRA Report which accompanies this planning application, asbestos has also been identified in soil at the site within the Made Ground beneath the site, and in buried pipework.

This work will comply fully with S.I. No. 122/2024, Safety, Health and Welfare at Work (Carcinogens, Mutagens and Reprotoxic Substances) Regulations 2024, S.I. 386/2006. Safety Health and Welfare at Work (Exposure to Asbestos) Regulations 2006 as amended and S.I. 589/2010, The Safety, Health and Welfare at Work Act (Exposure to Asbestos) Regulations 2010.

The quantity of Asbestos material to be removed (LoW 17 06 05\*) is estimated in Table 13.5.

**Table 13.5:** Estimate of Asbestos material to be removed

| Material                              | m <sup>2</sup> | Kg/m <sup>2</sup> | Total in Tonnes  |
|---------------------------------------|----------------|-------------------|------------------|
| Asbestos Insulation Board             | 1,325          | 12                | 16               |
| Asbestos Cement                       | 13,253         | 20                | 265              |
| VFT Bitumen                           | 1,125          | 16                | 18               |
| Galbestos                             | 400            | 7                 | 3                |
| Additional Contaminated Area/PreClean | -              | -                 | 15               |
| Electrical/Boilers                    | -              | -                 | 5                |
| Flanges                               | -              | -                 | 5                |
| Downpipes                             | -              | -                 | 1                |
| Paper on Pipes                        | -              | -                 | 1                |
| Contingency at 20%                    | -              | -                 | 66               |
| <b>Total (Rounded up)</b>             | -              | -                 | <b>395 (400)</b> |

All Asbestos material shall, be securely doubled bagged and removed from site by a specialist contractor. Should additional unknown asbestos material be uncovered during the demolition of the site, all related works and works adjacent to the asbestos (the extent of which is to be determined in accordance with a risk assessment) will be suspended until the asbestos material is removed by a specialist contractor.

In respect of chemicals on site, any unopened sealed stocks, including sealed chemicals previously used in water treatment or other functions will be returned to the suppliers if possible, otherwise disposed of as additional waste. All pipework etc. will be cleaned by licenced contractors. Where possible material remaining onsite at the outset of the project such as diesel will be used during the construction phase. This overall construction phase of the Proposed Development will typically result in the generation of a waste as described in Tables 13.6 and 13.8.

<sup>165</sup> Phoenix Environmental Safety Ltd. (2023) "Asbestos Survey Report (Refurbishment / Demolition Survey)"

Once the site is cleared of all materials and waste, a full demolition exercise can commence with the soft stripping of non-structural elements. This will include items such as windows, glass, benching and other wooden and possibly steel or metal fixtures that have been incorporated into the structure of buildings, but not of structural elements. This material will be segregated into their material type and sent for recovery or disposal to a licenced facility.

The demolition to the ground of on-site structures, the total number to be removed will be 68, with 17 of the existing buildings/structures to be retained. This will be undertaken by utilising a combination of high-reach and heavy-duty excavators fitted with shears and grab attachments. Controlled explosion will be used in some cases.

Steel structures such as cranes or steel columns will be cut down using hot cutting and further processed at ground level. Any hazardous steel structures such as oil or chemical tanks will be cleaned, gas freed as necessary and certified as such and then cut using cold-cut methods to ground level for further processing. Heavy-duty excavators will remove any gantries, hoppers, plant, and equipment.

Removal of high level steel framed huts will be cut up manually by operatives working at height or using a high reach excavator and shears. Alternatively lifting by crane to ground level for processing.

Very high structures such as The Big Techmag silo will have one side of its column legs cut by heavy duty excavator with a shear attachment and simply pushed over onto its side in a controlled manner, then processed by a machine. The surrounding steelwork will be sheared down.

The 3 large and 2 of the small east silos will then be removed by heavy duty excavator using hammer and muncher attachments, working in a top to bottom sequence to ground level.

The pet coke silo will have one side of its column legs cut by heavy duty excavator with a shear attachment and simply pushed over onto its side, then processed by machine.

Concrete slabs will be removed by heavy duty excavators with hammer attachments and buckets. All clean concrete will be processed on site by crushing to 6F2 aggregate standards and reused on site.

The hazardous and non-hazardous waste types expected to arise from the Proposed Development during the construction phase including demolition and their associated generation and waste management logistics are summarised in Table 13.6.

**Table 13.6:** Projected Waste Types and Description from Demolition (\* denotes Hazardous Wastes)

| Waste Type                                           | LoW Code             | Quantity in Tonnes | Waste Description and Proposed Waste Management Logistics                                      |
|------------------------------------------------------|----------------------|--------------------|------------------------------------------------------------------------------------------------|
| <b>NON-HAZARDOUS</b>                                 |                      |                    |                                                                                                |
| Waste Glass based fibrous material                   | 10 11 03             | 5                  | Waste will be collected in dedicated skips and sent to a specialist contractor for processing. |
| Discarded equipment and components removed from such | 16 02 14<br>16 02 16 | 1,000              | To be collected in separated skips and send for recycling.                                     |

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| Waste Type                                                                                                          | LoW Code | Quantity in Tonnes | Waste Description and Proposed Waste Management Logistics                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------|----------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Refractory Brick/other linings and refractories from metallurgical processes other than those mentioned in 16 11 03 | 16 11 04 | 400                | To be collected by specialist contractor for processing.                                                                                                                                                                                                                                                                                                                                                                                                   |
| Concrete                                                                                                            | 17 01 01 | 42,700             | Any concrete generated is expected to be clean, inert material and it is proposed to crush this on site to 6F2 aggregate standard and use it in backfilling of voids formed by the excavation of underground structures, land levelling and other fill purposes where possible. Where this is not possible it will be sent for appropriate recovery, recycling or disposal.                                                                                |
| Timber                                                                                                              | 17 02 01 | 8                  | It is expected there will be timber waste generated during demolition. Other sources will be damaged pieces of wood, wooden pallets and crates used for deliveries to the site. Uncontaminated timber, i.e. free from paints, preservatives, glues etc., will be segregated at source, and stored in dedicated skips and collected on site by a designated waste contractor for recycling.                                                                 |
| Iron/Steel                                                                                                          | 17 04 05 | 15,200             | Metals will be segregated at source from other waste streams and stored in dedicated skips and will be recovered. Steel panels that are comprised of composite metal and non-metal materials bonded together and are therefore more difficult to recycle. These will be taken off-site by a designated waste contractor for specialist shredding. The metal will be recovered and the residual will be incinerated at waste to energy licenced facilities. |
| Cabling                                                                                                             | 17 04 11 | 20                 | Non Hazardous waste cabling to be collected in a separate skip and collected by a specialist contractor for processing.                                                                                                                                                                                                                                                                                                                                    |
| Plasterboard                                                                                                        | 17 08 02 | 5                  | A designated covered skip will be provided, to prevent it getting wet, which will then be collected by a designated waste contractor to be recycled.                                                                                                                                                                                                                                                                                                       |

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| Waste Type                                                                                                                                                                     | LoW Code               | Quantity in Tonnes | Waste Description and Proposed Waste Management Logistics                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mixed construction waste not containing hazardous substances                                                                                                                   | 17 09 04               | 1,050              | Collected in stockpile for collection for further processing onsite / offsite as appropriate.                                                                                                                                                                                                                                                                                                                                                           |
| Textiles, carpet soft furnishings                                                                                                                                              | 20 01 11               | 200                | To be collected in a skip for disposal by a specialist contractor.                                                                                                                                                                                                                                                                                                                                                                                      |
| Plastic/Rubber                                                                                                                                                                 | 20 01 39               | 10                 | Plastic waste generated may arise from wall panelling, other plastics integrated into the existing buildings and other sources, primarily from belts, packaging and material off-cuts. All recyclable plastic will be segregated at source, and stored in a dedicated recycling skip and will be collected by a designated waste contractor to be recycled. All non-recyclable plastic will be disposed of at an appropriately licensed waste facility. |
| <b>HAZARDOUS</b>                                                                                                                                                               |                        |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Discarded equipment and components containing hazardous equipment                                                                                                              | 16 02 13*<br>16 02 15* | 1,150              | Collected by a specialist contractor for processing of site.                                                                                                                                                                                                                                                                                                                                                                                            |
| Other linings and refractories from metallurgical processes containing dangerous substances                                                                                    | 16 11 03*              | 340                | To be collected in separate skips for processing by specialist contractor.                                                                                                                                                                                                                                                                                                                                                                              |
| Asbestos<br>(as identified by the Phoenix Environmental Safety Ltd. report (Attachment 13.2) and in the underlying made ground and buried pipework (Atkins Réalis GQRA report) | 17 06 01*<br>17 06 05* | See Table 13.5     | All asbestos will be removed by specialist contractors as per S.I. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006 as amended. Any later uncovered asbestos post the initial asbestos removal will follow the same protocol.                                                                                                                                                                                     |

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| Waste Type                                          | LoW Code  | Quantity in Tonnes | Waste Description and Proposed Waste Management Logistics                                                                                                          |
|-----------------------------------------------------|-----------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Plaster board contaminated with dangerous substance | 17 08 01* | 5                  | Plaster boards other than 17 08 02 that is contaminated with dangerous substances. To be collected in designated covered skip for removal by specialist contractor |

### 13.4.2 Remediation and Construction Phase

An outline Construction and Environmental Management Plan (CEMP) and an outline Resource and Waste Management Plan (RWMP), as per the relevant EPA guidance<sup>166</sup>, for the project have been prepared and is provided as part of the planning application package for the Proposed Development. Once the main building contractor is appointed, the plans will be updated for approval by the Planning Authority before the commencement of construction.

The Proposed Development will involve significant earthworks and excavations. It is intended that certified uncontaminated excavated soil material will be retained onsite for reuse where possible in site tiering, the landfill capping and other uses to include void filling and in the final site landscaping programme. This material is referred to as “Cut and Fill Material”, the anticipated quantities of which are set out in Table 13.7.

All excavation works in the vicinity of identified hydrocarbon contamination (i.e. fuel tanks in north-western portion, Stockpile 1) will be supervised by an appropriately qualified Environmental Consultant with relevant contaminated land experience (refer to the AtkinsRéalis GQRA Report).

**Table 13.7:** Cut and fill material for reuse and treatment

| Material                                                                                                  | Estimated Quantity in Tonnes | LoW       | Comment                                                                                |
|-----------------------------------------------------------------------------------------------------------|------------------------------|-----------|----------------------------------------------------------------------------------------|
| Total material from cutting and excavations.                                                              | 445,000                      | 17 05     | Estimate total excavation during construction stage                                    |
| Total material from cutting and excavation to be reused on site for tiering, levelling, void filling etc. | 324,000                      | 17 05 04  | Clean material to be retained and used in development                                  |
| Estimated contaminated material                                                                           | 20,000                       | 17 05 03* | Soil contaminated with fuel oil or asbestos containing material, or due to elevated pH |
| Estimated uncontaminated material to be removed off site                                                  | 101,000                      | 17 05 04  | Estimated inert material to send off site for reuse                                    |

The CEMP will be implemented for the entirety of the construction phase by the Construction Management Team (CMT), to be appointed by PPL at the start of construction. The RWMP will include specific details on resource usage, waste segregation and management in accordance with best practice and the C&D Waste Management Guidelines. The Plans will be live documents and will be subject to revision throughout the remediation and construction phases. The plans will include specific details on the projected waste types and subsequent management as per EPA guidelines and legal requirements.

All soil and inert waste will be stored in dedicated stockpiles. All construction waste will be stored in bins and skips, located in a dedicated area of the temporary construction compound and removed

<sup>166</sup> Best Practice Guidelines for the preparation of resources & waste management plans for construction & demolition projects, EPA 2021



off-site once a week at a minimum. Soil to be removed off site will be subjected to testing to "Waste Acceptance Criteria (WAC), before deciding how and where the soil is to be moved.

Assuming the construction of circa 35,000 m<sup>2</sup> of floor space and using the Building Research Establishment (BRE) factors, Table 13.8 sets out the expected hazardous and non-hazardous waste types to arise from the Proposed Development and their associated generation and waste management logistics are summarised in Table 13.8.

**Table 13.8:** Projected Construction Waste Types and Description (\* Denotes Hazardous Wastes)

| Waste Type                                                          | LoW      | Quantity in Tonnes | Waste Description and Proposed Waste Management Logistics                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------|----------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NON-HAZARDOUS</b>                                                |          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Timber                                                              | 17 02 01 | 195                | It is expected there will be timber waste generated during construction. Other expected sources of timber will be cable drums, damaged pieces of wood, wooden pallets and crates used for deliveries to the site. Uncontaminated timber, i.e. free from paints, preservatives, glues etc., will be segregated at source, and stored in dedicated skips and collected on site by a designated waste contractor for recycling. |
| Glass                                                               | 17 02 02 | TBC                | A designated skip will be provided for any broken or other waste glass, which will be collected by a designated waste contractor to be recycled.                                                                                                                                                                                                                                                                             |
| Plastic                                                             | 15 01 01 | 35                 | Plastic waste generated during construction will primarily be from packaging and material off-cuts. All plastic will be segregated at source, and stored in a dedicated recycling skip and will be collected by a designated waste contractor to be recycled.                                                                                                                                                                |
| Cardboard                                                           |          |                    | Excess cardboard will be generated from shipping containers, boxes, packing material etc. The cardboard will be flattened and placed in a designated covered recycling skip on site to prevent it from getting wet. The cardboard will be collected by a designated waste contractor to be recycled.                                                                                                                         |
| Metals (including their alloys)                                     | 17 04 07 | 75                 | Metals will be segregated at source from other waste streams and stored in dedicated skips, before collection by licenced contractor for recycling.                                                                                                                                                                                                                                                                          |
| Insulation materials, e.g. piping, ducting, insulation panels, etc. | 17 06 04 | TBC                | Waste insulation materials other than asbestos will be separated and placed in a designated covered recycling skip on site to prevent it from getting wet. This waste will be collected by a designated waste contractor to be recycled.                                                                                                                                                                                     |

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| Waste Type                         | LoW                                | Quantity in Tonnes        | Waste Description and Proposed Waste Management Logistics                                                                                                                                                                                                                                                                                                                      |
|------------------------------------|------------------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Concrete                           | 17 01 01                           | 586                       | It is proposed that excess concrete be returned to the supplier in the mixing truck. All other concrete that is free from contamination to be crushed on site. Contaminated concrete will be collected and disposed of in a licenced facility.                                                                                                                                 |
| Brick, Tiles, Ceramics             | 17 01 03/<br>17 01 02/<br>17 01 07 | 60                        | Any brick, tiles and ceramics waste generated during the demolition can be segregated at source and stored in dedicated skip for recovery offsite.                                                                                                                                                                                                                             |
| Gypsum                             | 17 08 02                           | 30                        | Waste plaster and pasteboard. Will be collected in cover skips and sent for disposal in licenced facility.                                                                                                                                                                                                                                                                     |
| Mixed Construction Waste           | 17 09 04                           | 1086                      | Mixed C&D waste that cannot be segregated for recycling into the other waste streams will be placed into separate receptacles for recovery.                                                                                                                                                                                                                                    |
| Tarmacadam                         | 17 03 02                           | 100                       | Non-hazardous tarmacadam will be transported for recovery offsite in in designated recovery facilities by licensed contractors.                                                                                                                                                                                                                                                |
| Waste Electrical cabling           | 17 04 11                           | TBC                       | This will consist of electrical equipment that is damaged. Any electrical or electronic equipment and fittings will be sent for appropriate recycling. A receptacle will be available for WEEE. It is expected that electrical cabling will be produced during the construction. This cabling will be recycled for its copper and plastic.                                     |
| Soil and stones (non-hazardous)    | 17 05 04                           | Cut and Fill (Table 13.7) | Clean and newly excavated soil and stone will be used for levelling, tiering, landscaping and other appropriate uses on site.<br><br>Soils and subsoils excavated that are not suitable for reuse on-site or as part of the proposed landscaping works, will be re-used offsite. Material will only be moved and reused by suitably licenced waste contractors and facilities. |
| Paints, inks, adhesives and resins | 20 01 28                           | TBC                       | Paints, inks, adhesives and resins will be collected separately on site and removed by a designated waste contractor for appropriate recycling or disposal.                                                                                                                                                                                                                    |

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| Waste Type                                                          | LoW       | Quantity in Tonnes | Waste Description and Proposed Waste Management Logistics                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------|-----------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Canteen, Office/ Adhoc Wastes                                       | 20 03 01  | 58                 | Waste streams will be placed in a separate receptacle for office and canteen waste. Waste that cannot be segregated into recyclable fractions will be sent for energy recovery.                                                                                                                                                                                                                                                           |
| <b>HAZARDOUS</b>                                                    |           |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Hydraulic oils                                                      | 13 01 01* | 3                  | Fuels and oils contaminated and not suitable for reuse will be collected in drums in a designated bunded area of the construction compound. When the contents level of any drum reaches a predetermined level, the waste contractor will be notified, the necessary paperwork prepared and the required approvals obtained before transporting the waste liquid off-site to a designated for appropriate recycling, recovery or disposal. |
| Engine, gear and lubricating oils                                   | 13 02 04* | 3                  |                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Oil wastes not otherwise specified                                  | 13 08 02* | 3                  |                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Liquid Fuels                                                        | 13 07 03* | 3                  | Other waste fuel and fuel mixtures will be collected in drums in a designated bunded area of the construction compound. When the contents level of any drum reaches a predetermined level, the waste contractor will be notified, the necessary paperwork prepared and the required approvals obtained before transporting the waste liquid off-site to a designated for appropriate recycling, recovery or disposal                      |
| Absorbents, filter materials, wiping cloths and protective clothing | 15 02 02* | 4                  | All disposable PPE or any material contaminated with hazardous waste will be segregated from non-hazardous waste and disposed of in designated waste receptacles. All wipes and cloths, spill mats and bunding material used in the event of spills on site will be treated as hazardous waste and will be managed accordingly. These wastes will be removed off site by a licenced waste contractor and designated for thermal recovery. |
| Interceptor Sludge                                                  | 13 05 08* | TBC                | Oily water and sludge removed during periodic maintenance of hydrocarbon interceptors will be sent offsite for appropriate recycling, recovery or disposal.                                                                                                                                                                                                                                                                               |
| Aerosol wastes, spray paint cans                                    | 16 05 04* | 4                  | All aerosols waste will be segregated and sent for recycling to licenced facilities.                                                                                                                                                                                                                                                                                                                                                      |

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| Waste Type                                                     | LoW                     | Quantity in Tonnes | Waste Description and Proposed Waste Management Logistics                                                                                                                                                                                |
|----------------------------------------------------------------|-------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Insulation material. e.g. Pipe and duct insulation panels etc. | 17 09 03*/<br>17 06 03* | 455                | Waste insulation materials other than asbestos will be separated and placed in a designated covered recycling skip on site to prevent it from getting wet. This waste will be collected by a designated waste contractor to be recycled. |
| Paints , inks, adhesives, resin                                | 20 01 27*               | 4                  | Waste paint, inks etc. will be separated and placed in a designated covered recycling skip on site to prevent it from getting wet. This waste will be collected by a designated waste contractor to be recycled                          |

### 13.4.3 Operational Phase

Chapter 2 Description of Proposed Development and Section 13.4 provide details of what types of buildings and facilities included in the Proposed Development for which planning permission is being sought.

The potential non-hazardous and hazardous waste types that may arise from the Proposed Development when operational are summarised in Table 13.9.

**Table 13.9:** Projected Operational Waste Types and Description

| Waste Type                                       | LoW      | Waste Description and Proposed Waste Management Logistics                                                                                                     |
|--------------------------------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NON-HAZARDOUS</b>                             |          |                                                                                                                                                               |
| Paper waste / cardboard packaging                | 20 01 01 | Uncontaminated cardboard generated from bag boxes and waste paper: these will be collected and sent off site for recycling.                                   |
| Glass                                            | 20 01 02 | Glass from kitchenettes and perhaps uncontaminated laboratory waste will be collected and transported off-site for recycling.                                 |
| Waste Electrical and Electronic Equipment (WEEE) | 20 01 36 | WEEE will be collected separately and sent for appropriate recycling and disposal offsite.                                                                    |
| Timber                                           | 20 01 38 | Waste warehouse pallets generated during the operational process will be collected for reuse or offsite recycling.                                            |
| Plastics / plastic packaging                     | 20 01 39 | Non-contaminated plastic wastes such as bags, clamps, ties, delayering wrapping, dividers and wipes: these will be collected and sent off site for recycling. |
| Metals                                           | 20 01 40 | Small amounts of scrap metals, generated from computer racking in the DC and other applications.                                                              |

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| Waste Type                                           | LoW       | Waste Description and Proposed Waste Management Logistics                                                                                                                                                                                                                                                                  |
|------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Biodegradable waste                                  | 20 02 01  | Food and biodegradable wastes from kitchenettes will be segregated at source and will be sent offsite for recovery or disposal following the Waste Management (Food Waste) Regulations 2009, as amended.                                                                                                                   |
| Mixed municipal waste                                | 20 03 01  | Mixed municipal waste including canteen waste and general office refuse: These will be recycled where possible. Where recycling is not possible, waste will continue to be transported off-site for thermal treatment, with energy recovery where possible.                                                                |
| <b>HAZARDOUS</b>                                     |           |                                                                                                                                                                                                                                                                                                                            |
| Waste Printing Toner and Cartridges                  | 08 03 17* | Collected in a separate container and sent for recycling                                                                                                                                                                                                                                                                   |
| Waste oils                                           | 13 07 03* | Waste oils may be generated in minor quantities, mainly arising during maintenance activities. Waste oils for disposal will continue to be segregated and transported offsite for thermal treatment.                                                                                                                       |
| Contaminated Packaging                               | 15 01 01* | Bottles, bags, tubing sets, tools, filters, and connectors which have come into contact with hazardous substances may be produced during the operational process. These wastes will be placed in liners in drums. These wastes will be collected by a designated waste contractor and taken offsite for thermal treatment. |
| Cleaning wipes and protective clothing               | 15 02 02* | Cleaning absorbent wipes, empty wipe containers containing cleaning solvent and used PPE. These will continue to be collected in designated containers and transported off-site for thermal treatment.                                                                                                                     |
| Aerosols                                             | 16 05 04* | Aerosol canister wastes arising from maintenance activities onsite will be segregated, packaged onsite and transported offsite for appropriate treatment.                                                                                                                                                                  |
| Fluorescent tubes and other mercury-containing waste | 20 01 21* | Waste fluorescent tubes will be segregated and collected for offsite recycling by a suitably licenced waste contractor.                                                                                                                                                                                                    |
| Spent Batteries                                      | 20 01 33* | Spent batteries will be produced during the operational phase. These wastes will be segregated and collected by a designated waste contractor and taken off site for appropriate recovery or disposal.                                                                                                                     |



| Waste Type                                | LoW       | Waste Description and Proposed Waste Management Logistics                                                                                                                                                                                                                                                                                          |
|-------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| WEEE<br>(containing hazardous substances) | 20 01 35* | This will consist of electrical equipment that is out of date or damaged and contains hazardous substances. Similar to non-hazardous WEEE, all electronic and electrical equipment containing hazardous substances will be segregated and transported offsite for recycling in compliance with the WEEE Directive and associated WEEE Regulations. |

\* Denotes Hazardous Wastes

### 13.5 Potential Effects

The potential effects of the Proposed Development are assessed separately for the construction including demolition and operational phases. All foregoing work will be carried out where relevant in accordance to the Closure Remediation and Management Plan (CRAMP) agreed with the EPA and with the site's Demolition Management Plan (DMP). PPL has a long history of managing large quantities of material safely and environmentally and will bring this expertise to bear on all project elements.

#### 13.5.1 Construction Phase (including Demolition)

The potential effects of wastes generated during the construction phase including demolition of the development are summarised in Table 13.10.

**Table 13.10:** Waste/ Waste Management Potential effects during the construction phase including demolition.

| Potential Effects                                                                                                                                                                              | Quality  | Significance | Duration/<br>Frequency | Likelihood |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------|------------------------|------------|
| Expected overall increase in hazardous/non-hazardous waste produced from construction activities.                                                                                              | Negative | Significant  | Temporary              | Likely     |
| Improper hazardous waste storage/ containment of hazardous wastes could result in contamination of undesignated waste areas/pollution of environmental receptors on site or on adjacent sites. | Negative | Significant  | Short-term             | Unlikely   |
| Improper segregation of wastes/hazardous wastes could result in waste contamination, making wastes unsuitable for re-use/recycling.                                                            | Negative | Slight       | Brief                  | Unlikely   |
| Improper storage and securing of waste may result in litter issues on site or on adjacent sites.                                                                                               | Negative | Slight       | Brief                  | Unlikely   |
| The use of unlicensed or non-permitted waste contractors could give rise to inappropriate management of waste and result in environmental effects/pollution.                                   | Negative | Slight       | Short-term             | Unlikely   |

The proposed construction works will result in an overall increase of waste, which is predicted to have a Slight - Significant negative effect, that will brief to short-term in duration. With proper management, storage and transport of the wastes generated, the further possible negative effects of these wastes can be mitigated (refer to Section 13.7), making a significant negative effect on the environment unlikely.

### 13.5.2 Operational Phase

The potential effects of wastes that may be generated during the operational phase are summarised in Table 13.11.

**Table 13.11:** Waste/ Waste Management Potential effects during the Operational Phase

| Potential Effects                                                                                                                                                                                     | Quality  | Significance    | Duration/<br>Frequency | Likelihood |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------|------------------------|------------|
| Expected overall increase in hazardous/non-hazardous waste produced from operational activities.                                                                                                      | Negative | Not significant | Long-term              | Unlikely   |
| Improper hazardous waste storage/ containment of hazardous wastes could result in contamination of undesignated waste areas/pollution issues of environmental receptors on site or on adjacent sites. | Negative | Significant     | Long-term              | Unlikely   |
| Improper segregation of wastes/hazardous wastes could result in waste contamination, making wastes unsuitable for re-use/recycling.                                                                   | Negative | Slight          | Short term             | Unlikely   |
| Improper storage and securing of waste may result in litter issues on site or on adjacent sites.                                                                                                      | Negative | Slight          | Temporary              | Unlikely   |
| The use of unlicensed or non-permitted waste contractors could give rise to inappropriate management of waste and result in environmental effects/pollution.                                          | Negative | Moderate        | Temporary              | Unlikely   |

The operation of the Proposed Development will result in the ongoing generation of some waste streams, which will have a Not Significant to Moderate effect that will be temporary to long-term in duration.

With proper management, storage and transport of the wastes generated, the further possible effects can be mitigated (refer to Section 13.7), making a Slight-Moderate Negative effect on the environment unlikely.

It is emphasised that, the redeveloped Sustainably Powered Enterprise Campus will be managed and operated to the highest national and international sustainability standards, with sustainability at the heart of the project. All wastes are reduced to a minimum and where possible wastes will be assessed for reuse in the circular economy. Companies operating on the site will also be expected to operate in accordance with national and international sustainability standards and under the direction of the CORE management team.

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### 13.6 Potential Cumulative Effects

Cumulative effects may result by the addition of many minor or insignificant effects from the Proposed Development and other relevant projects to create larger, more significant effects. Relevant planned or permitted developments within the vicinity and context of the Proposed Development are outlined in Section 2.10 in *Chapter 2 Description of Proposed Development* of this EIAR and include:

- Large Scale Residential Development (LRD) (LCC Planning Ref.: 2360053);
- Self Storage Facility (LCC Planning Ref.: 2360137);
- Boyne Mill Commercial / Residential Development (LCC Planning Ref.: 2288);
- New Apartment Development, Cord Road (LCC Planning Ref.: 22504, An Bord Pleanála (ABP) Ref.: 316379-23);
- Port Access Northern Cross Route (PANCR);
- Part 8 – Road Construction (LCC Planning Ref.: 21600);
- Permission for an Office Extension (LCC Planning Ref.: 211000); and
- Permission for a cargo warehouse building (LCC Planning Ref.: 20733).

#### 13.6.1 Construction Phase (including Demolition)

Given the low level of residual effects in relation to waste management associated with the construction phase of the Proposed Development, there will be limited potential for cumulative effects to arise.

Concurrent construction works at the site and other development sites will be completed in accordance with project-specific CEMPs. The necessary environmental protection measures in compliance with legislative requirements and best practice will be implemented to protect and minimise the effects in relation to waste management such that no significant cumulative effects are predicted.

#### 13.6.2 Operational Phase

Given the low level of residual effects in relation to waste management associated with the operational phase of the Proposed Development, there will be limited potential for cumulative effects to arise.

It is noted that development at nearby sites as well as the Proposed Development may result in a cumulative increase in waste generation in the area. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area, as well as the Proposed Development, will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such, no significant cumulative effects are predicted.

#### 13.6.3 Potential Future Phases of CORE

As described in Section 2.11 of this EIAR, the Proposed Development to which this planning application relates is the first stage of CORE. Given the level of detail available on possible future phases of CORE, it is not possible to carry out a detailed cumulative assessment of potential effects in relation to waste management for the construction and operational phases with the future phases at this time.

Potential future phases of development will be subject to separate planning applications and Environmental Impact Assessment Report (EIAR), and Industrial Emissions Licensing by the EPA as required. Future phases of the development may require additional mitigation measures to

ensure the proper management of effects in relation to waste. These measures will be identified and detailed as part of the detailed design and EIAR for any additional respective phases of the development to ensure the potential future phases do not have any significant adverse effect on the water environment.

Furthermore, any subsequent EIAR's for a future phase of development will cumulatively assess any existing phases at that time.

### 13.7 Mitigation Measures and Monitoring of Effects

The mitigation measures to reduce/eliminate potential environmental effects in relation to waste are discussed separately for the construction including demolition and the operational phase.

#### 13.7.1 Construction Phase (including Demolition)

Construction waste shall be managed as part of a Construction Environmental Management Plan (CEMP) and the Resource and Waste Management Plan (RWMP), prepared in support of the planning application. These will be implemented and updated by the appointed contractors as required by Louth County Council (LCC) for the duration of the construction works and in compliance with any planning conditions. Alternatively, an addendum to the RWMP will be submitted to LCC, detailing specific measures to minimise waste generation and resource consumption and provide details of the proposed waste contractors and destinations of each waste stream.

Compliance with the CEMP and RWMP will ensure the mitigation of negative effects arising from wastes generated on site, outline versions of each accompany this planning application. Both documents will be updated prior to commencement of works by the contractor to include any mitigation included in the planning permission..

In addition, the following mitigation measures will be adopted:

- Building materials will be chosen to 'design out waste' as stated in the AtkinsRéalis Design Statement which accompanies this planning application;
- On-site segregation of waste materials will be carried out, to increase opportunities for off-site reuse, recycling and recovery. All waste types will be segregated;
- Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials shall be re-used on-site, where possible; (alternatively, the waste will be sorted for recycling, recovery or disposal);
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A Resource Manager will be appointed by the main Contractor(s) prior to commencement of works to ensure effective management of waste during the excavation and construction works;
- All waste leaving the site will be transported by suitably licenced contractors and taken to suitably registered, permitted or licenced facilities;
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

The following mitigation measures are also proposed to reduce the risk to human health from the presence of asbestos at the site:

- A detailed asbestos survey of all underground services within areas proposed for excavation during the construction phase, shall be undertaken prior to commencement of works to determine the extent of asbestos pipework and other features buried underground when the services have been exposed. A detailed asbestos survey of all underground services will be undertaken to determine the extent of asbestos pipework and other features buried underground;

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- A detailed Asbestos Management Plan (AMP) for any excavation works on the site shall be developed by an asbestos consultant prior to commencement of any demolition works with all mitigation measures, including site operative training and procedures, roles and responsibilities of individuals and monitoring measures detailed within the document.
- All excavation operations shall be undertaken on the assumption that asbestos containing materials (ACMs) or asbestos pipework could be encountered and appropriate health and safety including appropriate Personal Protection Equipment (PPE) provided to relevant site operatives working in these areas.
- The asbestos consultant shall advise if HSA notification is required prior to the commencement of any site excavation operations in accordance with *The Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations, 2006 & 2010*.
- All asbestos material identified shall be carefully removed and appropriately double-bagged and safely stored on-site for off-site disposal by a suitable licenced waste haulage company to an asbestos licenced waste disposal facility.
- All excavation operations in areas suspected to contain ACMs shall be supervised by an asbestos consultant.
- Should additional unknown asbestos material be uncovered during the demolition of the site, all related works and works adjacent to the asbestos (the extent of which is to be determined in accordance with a risk assessment) will be suspended until the asbestos material is removed by a specialist contractor.
- All PPE shall be treated as a hazardous waste. Disposal of this waste should follow the process outlined above for removal of asbestos material identified at the site.

### 13.7.2 Operational Phase

Consistent with the ethos of the Proposed Development, a site wide Environmental Management System (EMS) will be established for the operation of the Proposed Development.

All operational staff at the site will be required to conform to the site wide EMS.

This will ensure the ongoing management and minimisation of waste. There will be a continued pursuit of objectives and targets to reduce resource and material use and waste generation insofar as practicable as a principal of CORE.

All waste and resource material that cannot be used on site will be sent to licenced recycling and recovery outlets (off-site), thus ensuring the potential long-term impact of waste generation will be minimised.

A designated waste management/recycling area will be set up adjacent to the DC Loading dock as shown in the site plans accompanying this planning application. This area is an extensive HGV yard area between the DC and EC which has been designed for HGV/Truck access and turning.

All bins and waste receptacles will be sealed and the surrounding area maintained in a clean and tidy manner at all times to promote a clean and tidy work environment and to contribute to the Louth County Council Development Plan 2021-2027 objective SO 5 to "*Ensure a more sustainable and integrated concept of development with regard to land use, transportation, water services, energy supply and waste management over the lifetime of the Plan*". It is assumed that waste collection frequency will be as bi-weekly.

All waste materials will be segregated into appropriate categories and will be temporarily stored in appropriate bins, skips or other suitable receptacles in a designated, easily accessible areas of the site. PPL as the site manager will be responsible for ensuring and allocating personnel and resources, as needed for the production, updating and implementation of an Operational Waste Management Strategy for the site, ensuring a high level of recycling, reuse and recovery at the Site of the Proposed Development.



PPL will regularly audit the onsite waste storage facilities and infrastructure, and maintain a full paper trail of waste documentation for all waste movements from the site. The following mitigation measures will be implemented:

On-site segregation of all waste materials into appropriate categories, including (but not limited to):

- Packaging Waste,
- General Non-Hazardous Waste,
- Mixed Dry Recycling,
- Organic Waste,
- Glass,
- Non-Hazardous and Hazardous waste electrical equipment,
- Landscaping waste,
- Lightbulbs,
- Waste Oil,
- Batteries,
- Mixed Municipal Waste.

PPL will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials. PPL will ensure that all waste collected from the Site of the Proposed Development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available. PPL will ensure that all waste leaving the site will be transported by suitably licenced contractors and taken to suitably registered, permitted or licenced facilities.

These mitigation measures will ensure the waste arising from the proposed project is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, and associated regulations.

### 13.8 'Do-Nothing' Scenario

If the Proposed Development does not go ahead, there will be no demolition, excavation or construction at this site.

As discussed in Section 1.9.5 of this EIAR, if the Proposed Development does not occur, the site will return to full production, and waste production is expected to return to 2014 levels as set out in Table 13.4 (Operational Baseline Scenario).

When it is decided to cease production at the site in the future, the plant may be closed down and if so, the site will be subjected to the works outlined in the site's CRAMP as approved by the EPA. Waste will be generated as per Tables 13.1 and 13.2 and will have to be managed accordingly.

The site is zoned for general employment, and it is possible that a development of a similar nature would be progressed on the site in the future.

### 13.9 Residual Effects

#### 13.9.1 Construction Phase (including Demolition)

The mitigation measures detailed in Section 13.7.1 of this Chapter will ensure that all waste arising from the construction phase will be handled to comply with the provisions of the Waste Management Act 1996 (as amended), and associated regulations. Reuse and Recycling of waste produced during the construction phase will be maximised, in particular with respect of cut and fill material and the crushing of concrete for use as aggregate. Waste that cannot be used in the

development will be recycled with the exception of hazardous waste such as asbestos which will be deposited in accordance with best practice.

The measures proposed will optimise the levels of waste reduction, re-use and recycling during the construction phase. The residual impact is predicted to be negative, slight and short-term.

### **13.9.2 Operational Phase**

The fulfilment of this Proposed Development will see a marked reduction in volume and the total removal of hazardous substances that are a necessary feature of the current enterprise. All future waste produced will be managed in accordance with regulatory requirements including compliance with the provisions of the Waste Management Act 1996 (as amended), and associated regulations, the Litter Pollution Acts of 1997 to 2009, The Circular Economy and Miscellaneous Provisions Act 2022 and the *National Waste Management Plan for a Circular Economy 2024-2030*.

The PPL management team will bring their extensive knowledge and experience to bear to ensure waste reduction, reuse and recycling in congruence with the principles of the "Circular Economy".

The measures proposed will optimise the levels of waste reduction, re-use and recycling during the operational phase. The residual impact is predicted to be neutral, moderate and long-term.

### **13.10 Difficulties Encountered During Preparation of this Chapter**

There were no difficulties encountered in compiling this chapter of the EIAR.

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## 14 Material Assets

### 14.1 Introduction

This Chapter has been prepared to assess the potential for effects on Material Assets from the Proposed Development during the construction and operational phases at the Premier Periclase Ltd. (PPL) Site at Boyne Avenue, Newtownstaban, Drogheda, Co. Louth. This chapter should be read in conjunction with the following chapters of this EIAR.

- Chapter 4 Population and Human Health;
- Chapter 5 Landscape and Visual;
- Chapter 6 Traffic and Transportation;
- Chapter 7 Soils, Geology and Hydrogeology;
- Chapter 8 Biodiversity;
- Chapter 10 Water and Wastewater;
- Chapter 13 Waste Management;
- Chapter 15 Archaeology, Architecture and Cultural Heritage;
- Chapter 16 Major Accidents and Disasters.

In this chapter, the Material Assets that can be found on or adjacent to the Proposed Development site are assessed. Material Assets comprise the physical resources in the environment, which may be of human or natural origin that are valued and intrinsic to specific places. The objective of the assessment is to ensure that these assets are used sustainably for the Proposed Development.

Based on the results of the assessment, the necessary mitigation measures to minimise and where possible eliminate any potential effects are described.

### 14.2 Assessment Methodology

#### 14.2.1 Relevant Guidelines, Policy and Legislation

This Chapter was prepared noting appropriate EPA and EU guidance documents (listed below) to assess the effects of the Proposed Development on the material assets of the area.

- Environmental Protection Agency (EPA) (2022) "*Guidelines on the Information to be contained in Environmental Impact Assessment Reports*";
- EPA (2003) "*Advice Notes on current practice in the preparation of Environmental Impact Statements*";
- European Commission (2017) "*Environmental Impact Assessment of Projects, Guidance on the Preparation of the Environmental Impact Assessment Report*".

The EPA 2022 Guidelines recognise material assets as built services including:

- Electricity;
- Telecommunications;
- Gas;
- Water Supply Infrastructure;
- Sewerage.

The guidelines also recognise that material assets can be assessed in terms of road and traffic, waste management, aspects of cultural heritage, effects on agricultural land and effects on mining and quarrying.

The EPA 2003 Advice Notes separates material assets into cultural and economic assets. Economic assets typically include those of natural origin and human origin. Cultural assets include those of the physical type and social type. The advice notes, state that *'the objective of the assessment is to ensure that these assets are used sustainably so that they will be available for future generations'*.

The EU 2017 EIAR guidance also highlights the use of natural resources as a material asset such as the use of fossil fuels and minerals.

Those material assets that are relevant have been assessed in terms of their likely significant effects arising from the Proposed Development. Many of the aforementioned environmental factors, which are included as material assets, are discussed within other chapters of this EIAR.

Material assets of natural origin, which have been considered elsewhere in this EIAR, include:

- Geological Resource – Refer to *Chapter 7 Soils, Geology and Hydrogeology* and *Chapter 13 Waste Management*;
- Designated Areas – Refer to *Chapter 5 Landscape and Visual*, *Chapter 7 Soils, Geology and Hydrogeology*, *Chapter 8 Biodiversity*, and *Chapter 15 Archaeology, Architecture and Cultural Heritage*;
- Scenic routes – Refer to *Chapter 5 Landscape and Visual*.

Material assets of human origin, which have been considered elsewhere in this EIAR, include:

- Public Utilities including water supply and sewerage – Refer to *Chapter 2 Description of the Proposed Development* and *Chapter 10 Water and Wastewater*;
- Roads and Traffic – Refer to *Chapter 6 Traffic and Transportation*, and *Chapter 16 Major Accidents and Disasters*;
- Land Use, Property, Recreational Facilities and Amenities – Refer to *Chapter 4 Population and Human Health*;
- Cultural Heritage – Refer to *Chapter 15 Archaeology, Architecture and Cultural Heritage*;
- Waste Management – Refer to *Chapter 13 Waste Management*.

The above listed environmental factors are not considered in this chapter as they are assessed elsewhere in this EIAR. The following Material Assets that have not been considered in other chapters of the EIAR are assessed in this chapter:

- Electricity;
- Natural Gas and Oil;
- Solid Fuels;
- Telecommunications;
- Fill Material.

#### **14.2.2 Sources of Information**

Information gathered from the planning, design, construction and operation of the Proposed Development has been incorporated to inform the extent of the services being assessed and the consideration of potential effects on Material Assets from this Proposed Development.

The following sources have been examined and analysed during the preparation of this chapter:

- CORE Site Development Plan Strategy Document;
- PPL Annual Environmental Reports;
- Pre-Planning Application Brochure;
- PPL's Biannual Groundwater Monitoring Reports;

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- Information from the Project Design Team;
- Visits to the existing site;
- EPA Reports available at its website related to the PPL site;
- Louth County Council Planning Search;
- Geological Survey of Ireland website and Maps;
- National Parks and Wildlife Service Map Viewer;
- EPA Map Viewer;
- The ESB GIS Database;
- Uisce Éireann website and records;
- Gas Networks Ireland website and records;
- Available telecommunications records.

A desk study was carried out on the existing material assets associated with the site of the Proposed Development and evidence compiled on the basis of site visits. Current and proposed usage of material assets was assessed to determine the potential effects of the Proposed Development and mitigation measures are proposed where relevant.

### 14.3 Receiving Environment

The proposed site is located ca. two kilometres to the east of Drogheda town centre along the northern bank of the River Boyne. The southern boundary of the site is established by the R167 Strand Road that runs parallel to the river from Drogheda to Baltray. The Drogheda Port Company's Tom Roes Point Terminal is located adjacent to the Southern boundary of the PPL site adjacent to the edge of the river. The existing site has its own quayside facility that is used for loading and unloading ships for the PPL operations, known as the wharf.

Characteristics of the receiving environment with relevance to some material assets are discussed within their respective chapters within the EIAR (see Section 14.2.1). Those material assets that are not discussed in other chapters of the EIAR are included below.

With reference to Section 1.9.4 of this EIAR, where possible and appropriate, information has been provided for the current conditions for the site (i.e. the existing baseline scenario), and for the year 2014 when the site was fully operational, a scenario it is proposed to return to should the Proposed Development not proceed (i.e. the operational baseline scenario).

#### 14.3.1 Electricity

The site is currently serviced by electricity from a dedicated 38 kVA substation located 250 m north of the existing site. High voltage cables run from the substation via a 10 m wide wayleave across agricultural land and enter the site on the northern boundary of this site. The ESB GIS database shows a Medium Voltage overhead power cable traversing the site supplying the Port Area. The Maximum Import Capacity (MIC) for the site is 4.25 MVA.

Electricity usage in 2014 for the site (operational baseline scenario) was 24.87 gigawatts hours of electrical power. In 2021, this figure had reduced to 18.2 gigawatt hours due to the reduced activity on the site. Further reduction of the production on the site and reduced working hours saw an electrical consumption in 2023 of just 6.3 gigawatt hours of power (existing baseline scenario).

#### 14.3.2 Natural Gas

Currently, there is an existing 250 mm diameter 70 bar high-pressure gas pipeline that traverses the site from south to north. In addition to the pipeline, there is a Gas Networks Ireland owned Gas Skid adjacent to the PPL site boundary from which two medium pressure gas pipelines head towards the R167 Strand Road. Additionally, Gas Networks Ireland's database records a medium-pressure gas pipeline crossing the site to the west. This pipe enters via the main access road and



heads north through the site to connect with other medium pressure gas pipelines serving the industrial complex northwest of the site.

Natural gas consumed in 2014 at the site (operational baseline scenario) was 263.4 Gigawatt hours. In 2021, this had reduced to 154.6 gigawatt hours and in 2023 (existing baseline scenario), the natural gas demand was zero because of the significantly reduced production at the site.

#### 14.3.3 Oil

To the north of the site, there is an existing redundant oil pipeline connected to the existing redundant oil tank. This oil supply was a fuel source before natural gas became available to the site.

In addition to the redundant fuel oil tanks, there are several smaller ca. 3,000 litre steel diesel oil storage tanks located on the site. Their use was for site specific equipment and to fill mobile machinery.

#### 14.3.4 Solid Fuels

Historically PPL used considerable quantities of solid fuel in the form of Petroleum Coke (PetCoke). In 2014 (the operational baseline scenario) almost 17,000 metric tonnes were combusted for heat.

#### 14.3.5 Water Supply

Currently, the site is served by three sources of water:

- Potable water from Uisce Éireann;
- Freshwater extracted from the Mell Quarry Reservoir and the River Boyne at Littlegrange;
- Seawater from the Baltray Seawater reservoir.

Full details of the water supply to the PPL site are discussed in *Chapter 10 Water and Wastewater* of this EIAR.

There are also a number of disused abstraction wells located within the PPL site boundary. Further details are provided in *Chapter 7 Soils, Geology and Hydrogeology*.

#### 14.3.6 Wastewater

Wastewater currently generated at the PPL site consists of:

- Sanitary/foul wastewater from toilets, washrooms and canteens, which discharges to the Uisce Éireann 150 mm diameter foul sewer serving the site and ultimately to Drogheda Wastewater Treatment Plant (WWTP);
- Process water from site processing activities, which is monitored at Emissions to Water point SW1 in accordance with the site's IE Licence (Reg. No. P0376-02) conditions prior to discharge to the Irish Sea.

Full details in relation to wastewater effluent from the site are detailed in *Chapter 10 Water and Wastewater* of this EIAR.

#### 14.3.7 Telecommunications

The site is serviced from the existing communications assets entering the site.

#### 14.3.8 Fill Material

The existing PPL site contains three significant stockpiles of fill material from the PPL operation and previous Irish Cement works in the 1960s at heights of 24, 26 and 21 metres above datum. These stockpiles, deposited over the years of activity at the site are shown in Figure 14.1.

This material in Stockpile 1, at about 2 m high above ground level and approximately 18,000 m<sup>3</sup> in volume, is inert and is formed of lime kiln dust from historical Cement Ltd. activities. However there are some localised hydrocarbon contamination hotspot areas in Stockpile 1. It is estimated that ca. 9,000m<sup>3</sup> of this material is hydrocarbon impacted.

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Stockpile 2 contains clinker from the kilns and lime kiln dust. It covers approximately 9,500 m<sup>2</sup> with a volume of 32,000 m<sup>3</sup>, also from historical Cement Ltd. activities.

Both stockpile 1 and 2 were placed immediately on the ground and both are covered with approximately 0.5 m of clay capping.

Stockpile 3 located adjacent to the R167 Strand Road contains lime kiln dust, clinker and cement from both Cement Ltd. and PPL activities. It was first operated in the 1960s and is believed to have been placed in a void of approximately 2 m deep and has risen over the years to a peak of 4 m above ground level. It is estimated to contain a volume of 55,000 m<sup>3</sup>. The waste is also covered with an estimated 0.5 m of clay capping.

#### 14.3.9 Landfill

Waste from the PPL manufacturing process has been deposited in the Landfill Area since 1981. The landfill occupies approximately 6.5 ha of a former sand and gravel quarry in the eastern part of the licensed site. The in-situ subsoils were excavated and used to form perimeter berms and production wastes were deposited in the excavated area.

The landfill is used to store waste from the facility and the production process and is licenced to accept material as detailed in Table 14.1.

The landfill has been in operation for over 30 years and at the average rate of disposal of 14,627 m<sup>3</sup> per annum, measured over a seven year period, it is expected to have capacity up to 2030 under a business as usual production basis.



**Figure 14.1:** Aerial photograph showing location of the on-site landfill and stockpiles 1, 2 & 3 (Spoil Heaps A, B & C as described in *Chapter 7 Soils Geology and Hydrogeology* as shown)

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**Table: 14.1:** Material accepted into the landfill

| Waste Type                | LoW Code |
|---------------------------|----------|
| Slaker Grits              | 10 13 04 |
| Lime Dust                 | 10 13 06 |
| Spent Refractory Material | 16 11 06 |
| Seawater Clarifier        | 19.09.02 |
| Reactor Grits             | 10 13 99 |
| Rejected Lime             | 10 13 04 |
| Shaft Kiln Fines          | 10 13 94 |

## 14.4 Characteristics of the Proposed Development

The Proposed Development to which this planning application relates is the first phase of CORE, and will consist of extensive works that will transform the ca. 35.6 hectare site and set it on a path that will result in it becoming a sustainably powered enterprise campus. It is noted that the Proposed Development is unrelated to the existing Industrial Emissions licensed activity at the site. The Proposed Development consists of:

- The demolition of existing buildings, structures, and services associated with the PPL facility, as well as site clearance and remediation works.
- The careful sequestering of the licensed (inert) landfill onsite in accordance with all ongoing and future requirements of the EPA.
- A number of existing buildings and structures will be maintained as part of the Proposed Development, such as a Workshop Building, part of a Crane Store structure, 3 no. Lime Silos and water tanks and infrastructure, all of which have been incorporated into the design where beneficial and appropriate.
- The construction of a three storey Energy Centre (EC) building, a three storey Data Centre (DC) building, a single storey Facility Operations Centre (FOC) building, a single storey Pump and Filtration Building, a single storey Security Gatehouse and a Security Kiosk at the main site entrance of the site.
- The provision of a Battery Energy Storage System (BESS) Compound, an ESB Substation, a Cooling Compound, a Thermal Store Compound, a Pump and Filtration System, other ancillary structures including a Firewater Tank, a Fire Fighting Water Pump Building, a Control Building, a Maintenance Yard and Waste Management facilities. Ground-mounted solar Photo Voltaic (PV) arrays will also be provided on the existing licensed landfill and stockpile no. 3, along with 3 no. compact substations.
- The provision of all associated works including access arrangements, internal roadways and footpaths, car and cycle parking, boundary treatments, landscaping and services, and all ancillary works.

A detailed description of the Proposed Development is included in *Chapter 2 Description of Proposed Development* of this EIAR, which includes details of the demolition works required, details of the construction of the new buildings and structures, and details of the various elements that will make up the Proposed Development when it will be operational.

The following subsections provide details on the various materials assets under consideration in this chapter and the potential of the Proposed Development to have an effect on these material assets.

### 14.4.1 Electricity

Figure 14.2 provides an overview of the energy technology to be employed at the Proposed Development.

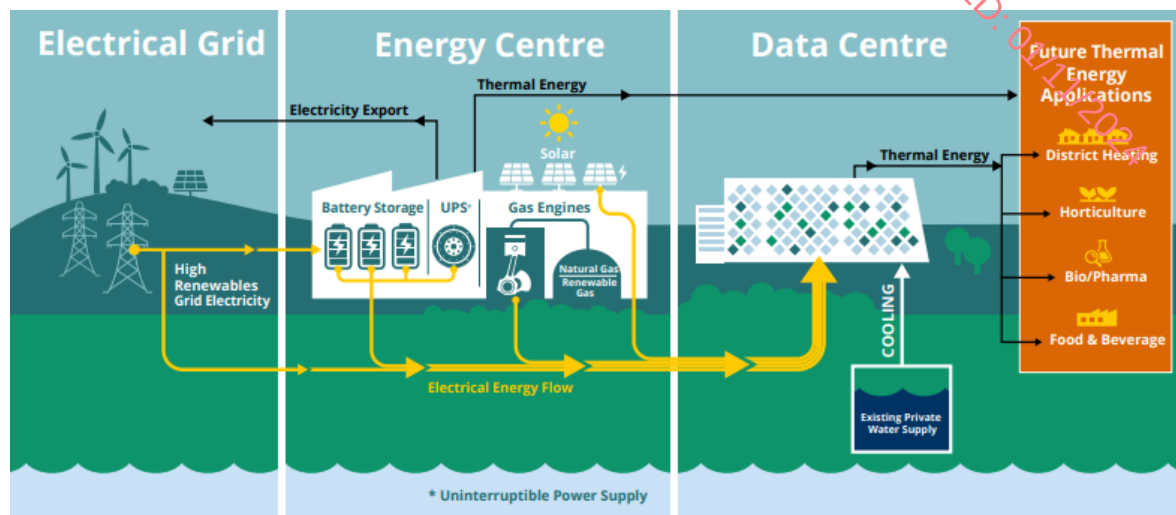


**Figure 14.2:** Overview of the Energy Technology to be employed at the Proposed Development

It is proposed that upon the completion of the Proposed Development, it will operate both as a consumer and producer of electricity. Electricity will be consumed when the grid's fuel-mix is predominantly renewable and electricity demand on the grid is low which will usually occur at night. At peak electricity demand, the grid is most vulnerable and at its highest carbon intensity due to the increased demand requiring older more carbon intense national energy generators (e.g. coal) to be switched on to provide the necessary extra power to meet demand. At these times, the Proposed Development will provide a flexible demand-response (reduces its grid electricity demand to near zero and provides its own power), leaving the energy market and supporting the loads with its own assets enabling the reduction/elimination of emissions in real-time (hour-for-hour) on the campus.

The EC will also have the ability to export to the grid in order to displace the highest carbon intensity energy generators on the grid. It can be considered as a flexible "Grid-Edge" Asset with the ability to potentially provide power quality and power export services to the electricity network, which would provide a valuable balancing service to the electricity grid. This results in infrastructure that is more sustainable and cost effective, while also being more resilient, fault-tolerant and concurrently maintainable. This reliability could potentially extend to the grid itself, due to this system's ability to enhance power quality, capacity and balancing services.

The Energy Campus will optimise electricity supplied from solar panels to be located on the roofs of the proposed EC and DC buildings, the south façade of the Date Centre and solar arrays located on other parts of the site unsuitable for development, such as the to be capped landfill and stockpile 3.

In the north-west corner of the site, the intention is to utilise the existing entrance on the L2307 road to facilitate access to that portion of the site only with a separate access gate for the ESB to access the on-site substation. This substation will be powered by the existing Newtownstalaban substation via a cable that the ESB will run along the L2307 (subject to its own planning consent) (refer to Figure 14.3 which shows an indicative route for the cable along the L2307).

The substation itself consisting of two separate transformers will step down the 38 kV incoming power to 20 kV, which will be the voltage rating for the on-site MV system consisting of the CORE EC and associated energy infrastructure. The compound that houses the substation will be segregated with one side accessible to ESB and one side for site staff. The substation control room within the compound will be similarly segregated.

Electricity can be imported and potentially also exported from the Gas Insulated Substation (GIS) depending on grid emissions intensity and market conditions as follows:

- Contracted renewable electricity (procured using PPAs) will be imported to the campus through the public grid.



- This will be supplemented by imports from the electricity market when the emissions meet the Campus threshold for carbon intensity.
- Otherwise, the EC will rely on its on-site energy resources and reduce the demand on the grid. If the grid comes under stress or has very high emissions intensity, the campus has the ability to potentially export power (and grid services as required) to assist.

In addition, the Proposed Development will optimise the use of roofs and facades of the proposed EC and DC for solar electricity generation, as well as two stockpile areas on the campus (the licenced landfill to the east of the site and Stockpile number 3, being utilised for ground mounted solar).



**Figure 14.3:** Indicative Route for Connection to Offsite Substation along the L2307

### Power Reserves

Central to the power electronics line-up is a Medium Voltage (MV) Rotary Uninterruptible Power Supply (UPS) System with a capacity of 37.8 MW coupled to a Rotary Kinetic Energy Storage system (or equivalent systems), which will act a primary reserve. This parallel array will provide protection from a broad spectrum of utility voltage events and will supply continuous clean power to the protected load with enough autonomy to support it for 20 seconds.

The power characteristics and inertia of this rotating machine will ensure smooth transitions between the various energy generation and storage systems that support the load including: solar generation; gas generation; battery energy storage; and the grid itself.

As well as protecting the Load, it is also possible to protect the grid. Many of the frequency containment services at other sites that are exported to the grid are delivered through the power electronics of the UPS System.

The On-Site Battery Energy Storage System (BESS) is a 36 MW grid-scale lithium-ion battery array that acts as a secondary reserve to the UPS system. For load protection, it takes over from the UPS system up to 200 ms, which preserves approximately 99% autonomy of the UPS and supports the design load for up to 3 hours.

The BESS has a central role in displacing real-time emissions. It will store renewable electricity from the grid when available and discharge during periods of higher grid emissions intensity. Time-shifting of electricity consumption (emissions) is a key element of the demand response characteristics of the site.

It also has the ability to potentially provide a comprehensive range of grid services (frequency containment and restoration) and could possibly displace conventional generators that provide



these services. Due to its quicker response, it could provide these services without taking up the capacity that “must-run” generators do, and significantly decarbonise the operation of the grid itself.

Generally, the BESS batteries will charge at night when electricity demand on the grid is low and are discharged in the following evening peak, when demand is high, to help reduce peak demand on the grid.

Tertiary reserve will be provided from nine 4.5 MW (electrical output) reciprocating gas engines allowing a gradual hand-off of load from the batteries. This configuration overcomes the load acceptance limitations of gas engines while outperforming diesels for emissions and overall efficiency.

The engines are constrained to operate only if they outperform the marginal generator on the grid for emissions intensity. They are used for demand response but also have the ability to potentially export power at times when there is a scarcity of generation on the grid should there be agreement in place with the System Operator to provide such services.

When the campus can produce its own electricity at lower emissions than the grid, it will do so. This is central to the real-time emissions strategy of the EC and reducing the load on the grid at peak times.

#### **14.4.2 Natural Gas and Oil**

Gas Networks Ireland’s (GNI) Drogheda Transmission Station is located adjacent to the PPL site and operates at 70 bar, which in-turn provides a 4 bar connection to an existing Above-Ground Installation (AGI) on the PPL site to serve the site gas requirements. The on-site gas distribution AGI will be modified and upgraded to suit the new operations on site. A new natural gas ring main will be constructed in order to provide a gas supply to the EC for the engines via a manifold.

The current oil storage, both diesel and fuel oil will be cleaned by specialist contractors, dismantled, removed and the metals sent for recycling.

#### **14.4.3 Heat Network**

Key to assessing the suitability of the site for the project is the ability to couple large electricity users with large thermal users.

The Proposed Development will have a closed secondary loop system with low temperature hot water and medium temperature hot water storage collecting waste heat from DC operations and electricity generation. It may be possible to reuse this waste heat which will be a consideration of any potential future development at the site. Further information is provided in Section 2.11 of this EIAR.

#### **14.4.4 Solid Fuels**

If the Proposed Development is approved and planning permission granted, the use of PetCoke will cease and the site’s PetCoke infrastructure will be cleaned, dismantled and recycled.

#### **14.4.5 Water and Wastewater**

Full details in relation to the proposed water supply and sewerage services as part of the Proposed Development are provided in *Chapter 10 Water and Wastewater*.

#### **14.4.6 Telecommunications**

A significant internal telecommunication network will be developed to include broadband requirements. To service this need, it is foreseen that additional services for both telecommunications and broadband will be required.

Similar to the connection to the nearby substation (Section 14.4.1), the routing of any telecommunications connection will be defined following receipt of planning permission of the Proposed Development. The DC tenant will review and assess the routing options and obtain the necessary consents for the connection.

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**14.4.7 Fill Material**

It is proposed to move uncontaminated material from stockpile 1 (ca. 9,000m<sup>3</sup>) and stockpile 2 (32,000m<sup>3</sup>) to the landfill. For stockpile 3, it is proposed to carry out minimal levelling works to facilitate the installation of a Solar PV array. The proposed Solar PV array on Stockpile 3 is designed for minimal intrusion as it will be mounted on a ballasted foundation system sitting on the levelled ground, and will not require any excavations for in-ground foundations. The PV panels themselves will be mounted on a proprietary steel frame system fixed to the ballast system. The ballast system will take the form of prefabricated concrete blocks.

**14.4.8 The Landfill**

Once material from stockpiles 1 and 2 and other suitable material from the site preparation and/or demolition process has been moved to the landfill, the landfill will be capped in accordance with EPA requirements and used to mount a solar array on it in a similar fashion to that of stockpile 3. This solar array will add considerable generation capacity to the campus, thus making a significant contribution to the generation of green electricity and the ethos of the CORE.

**14.4.9 Land Use**

The development of CORE will have a significant, remediating effect on the PPL site. The Proposed Development will create more resilient infrastructure that aligns with the interests of the energy infrastructure industry and will help in assisting the country with its energy transition to a net zero carbon economy. The scheme intends to achieve secure, carbon-free energy operations in real-time. The design proposal has included the retention of part of the existing structures for the purpose of respecting the architectural heritage of the site. The new development will enhance the visual amenity of the area and in conjunction with the PANCR enhance the development of the lands to the north which are zoned as E1 for general employment.

**14.5 Potential Effects****14.5.1 Construction Phase (including Demolition Works)**

The potential effects associated with the Construction Phase (including the demolition works) as part of the Proposed Development on material assets are described in Table 14.2. Reference should be made to other chapters of this EIAR where certain material assets are discussed in detail (see Section 14.2.1).

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**Table 14.2:** Potential Effects during the Construction Phase (including Demolition Works)

| Potential Effects                                                                                                                                                                                                                                                                                                                                                                        | Quality  | Significance  | Duration/<br>Frequency | Probability |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------------|------------------------|-------------|
| Natural resource use: The excavation of material to facilitate the construction of the Proposed Development, levelling, tiering and expansion of roadways and use in individual buildings. Suitable uncontaminated materials will be reused where appropriate. Any material not suitable for reuse onsite will require removal and transport to appropriately licensed waste facilities. | Negative | Slight        | Long Term              | Likely      |
| There may be a short term increase in demand for electricity during the construction phase.                                                                                                                                                                                                                                                                                              | Neutral  | Imperceptible | Short-term             | Likely      |
| There may be an increase in use of fuel consumption for site machinery and generators.                                                                                                                                                                                                                                                                                                   | Negative | Imperceptible | Short-term             | Likely      |

#### 14.5.2 Operational Phase

The potential effects associated with the operational phase of the Proposed Development on the material assets of the area are summarised in Table 14.3. Reference should be made to other chapters of this EIA where certain material assets are discussed in detail (see Section 14.2.1).

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**Table 14.3:** Potential effects during the Operational phase

| Potential Effects                                                                                                                                                                                                                                                                                                                                                                                   | Quality                                                                              | Significance    | Duration/<br>Frequency | Probability |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------|------------------------|-------------|
| Demand for imported electricity will increase upon completion of the Proposed Development, however, the Proposed Development includes infrastructure that will minimise the demand from the grid during peak hours (as discussed in Section 14.4.1), and an energy strategy which means that demand will be predominantly fulfilled by renewable energy as discussed in <i>Chapter 12 Climate</i> . | Negative                                                                             | Not significant | Long term              | Likely      |
| Natural gas will be the main source of fuel for the 9 no. 4.5 MW engines; however as discussed in <i>Chapter 12 Climate</i> , the Proposed Development will use less Natural Gas than the current Operational Baseline scenario. PPL will investigate potential use of bio methane in the future (see Section 14.6.3).                                                                              | Positive<br>(when assessed against operational baseline scenario (see Section 14.3)) | Significant     | Long term              | Likely      |
| Use of fossil fuel on-site will be continuously reduced with the intention of ultimately phasing out fossil fuels.<br><br>The use of PetCoke will not be a fuel source of the Proposed Development.                                                                                                                                                                                                 | Positive<br>(when assessed against operational baseline scenario (see Section 14.3)) | Significant     | Long term              | Likely      |

## 14.6 Potential Cumulative Effects

Cumulative effects may result by the addition of many minor or insignificant effects from the Proposed Development and other relevant projects to create larger, more significant effects. Relevant planned or permitted developments within the vicinity and context of the Proposed Development are outlined in Section 2.10 in *Chapter 2 Description of Proposed Development* of this EIAR and include:

- Large Scale Residential Development (LRD) (LCC Planning Ref.: 2360053);
- Self Storage Facility (LCC Planning Ref.: 2360137);
- Boyne Mill Commercial / Residential Development (LCC Planning Ref.: 2288);

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- New Apartment Development, Cord Road (LCC Planning Ref.: 22504, An Bord Pleanála (ABP) Ref.: 316379-23);
- Port Access Northern Cross Route (PANCR);
- Part 8 – Road Construction (LCC Planning Ref.: 21600);
- Permission for an Office Extension (LCC Planning Ref.: 211000); and
- Permission for a cargo warehouse building (LCC Planning Ref.: 20733).

The potential cumulative effects of the Proposed Development with any/all relevant other planned or permitted developments as outlined in *Chapter 2 Description of Proposed Development* of this EIAR are discussed below for the construction (including demolition) and operational phases respectively.

Reference should be made to other chapters of this EIAR where potential cumulative effects on certain material assets are discussed in detail (see Section 14.2.1).

#### **14.6.1 Construction Phase (including Demolition Works)**

The Proposed Development and the other identified developments will require site clearance, excavations and levelling which will generate localised requirement for soil removal and/or import, power and water supply and wastewater discharge. However, provided standard mitigation measures set out in the EIARs and CEMPs for these developments or where EIA does not apply, provided that planning conditions are implemented, the cumulative effect will be short-term, negative and not significant.

#### **14.6.2 Operational Phase**

The Proposed Development and all identified developments considered are required to engage with Gas Networks Ireland, Louth County Council, Uisce Éireann and ESB to ensure that there is sufficient capacity to cater for the increase in gas, water and wastewater and electricity requirements. In developing long term plans for security of supply, these National Authorities are required to develop resources in compliance with sustainable environmental planning.

In relation to the potential cumulative effects on the material assets during the operational phase (when compared to the operational baseline scenario), works which would have potential cumulative effects include:

- Increased demand for telecommunications and broadband;
- Increased demand for grid-supplied electricity;
- Reduced demand for natural gas.

Provided standard mitigation measures set out in the EIARs for these developments or where EIA does not apply, provided that planning conditions are implemented, the cumulative effect on the material assets for the operational phase is anticipated to be long-term, neutral and imperceptible.

With respect to the LRD development adjacent to the PPL site to the west (LCC Planning Ref. 2360053), the Proposed Development will have a positive effect by removing a manufacturing site, which in its present form is purely functional and unattractive.

#### **14.6.3 Potential Future Phases of CORE**

As described in Section 2.11 of this EIAR, the Proposed Development to which this planning application relates is the first stage of CORE. Given the level of detail available on possible future phases of CORE, it is not possible to carry out a detailed cumulative assessment of potential effects on Material Assets for the construction and operational phases with the future phases at this time.

Potential future phases of development will be subject to separate planning applications and Environmental Impact Assessment Report (EIAR), and Industrial Emissions Licensing by the EPA as required. Future phases of the development may require additional mitigation measures to



ensure the proper management of effects on Material Assets. These measures will be identified and detailed as part of the detailed design and EIAR for any additional respective phases of the development to ensure the potential future phases do not have any significant adverse effect on the water environment.

Furthermore, any subsequent EIAR's for a future phase of development will cumulatively assess any existing phases at that time.

## **14.7 Mitigation Measures and Monitoring of Effects**

The mitigation measures associated with the material assets which are discussed in other chapters are provided in their respective chapters. The mitigation measures not explored in other chapters are discussed separately below for the construction (including demolition) and operational phases of the Proposed Development.

### **14.7.1 Construction Phase (including Demolition Works)**

Normal construction working hours will be Monday to Saturday 07:00 to 19:00. There will be no works on Sundays or public holidays. Construction works on Saturdays 13:00-19:00 will be scaled down in comparison to works during the rest of the week, and will not involve any noisy activities, such drilling, breaking, crunching or hammering, for example. Demolition activities will be limited to Monday to Saturday 07:00 to 19:00.

Mitigating measures that will be implemented to reduce the potential interruption to local services, such as electricity supply, gas supply, telecommunications, road use, water supply and sewage etc., will include continuous consultation with the ESB, Gas Networks Ireland and other service providers to time breaks in services to minimise disruption to local residences. There will be full consultation with Louth County Council to explore how to achieve minimum disruption, which may include some night-time working to carry out work that could involve service interruption (night-time work will only be carried out following consultation with and approval from Louth County Council). Full cognisance and balance between nuisance as a result of these works and night work will be a feature of consideration.

Measures to minimise nuisance from the possibility of draw out of site material will include road sweeping, the use of vehicle wheel washes, rumble bar to dislodge clay and muck before exiting the site. Water sprays will be employed to reduce dust in dry weather. All trucks entering and leaving the site will be covered. Road washing will be undertaken as required.

The reduction of noise and visual negative impacts, and for the protection of the public, the entire site will be fenced off to a height of 2.4m. Security will be present on the site at all times, including security patrols during non-working hours. Entry to the site will be restricted to authorised personnel.

A detailed Demolition Management Plan (DMP) has been prepared and a Construction Environmental Management Plan (CEMP). Both plans will be operated concurrently and will be updated as required during the construction and demolition works.

A Project Supervisor Construction Stage (PSCS) is to be appointed following contracts award and it should be recognised that the responsibility for the construction works shall lie with them. The works will be carried out in line with the PSCS's own Method Statement together with their policies and procedures, including all relevant Task-Specific Safe Working Procedures. The PSCS will adhere to the main minimum environmental mitigation requirements as stated within this document, but under their own developed systems. During all works, the PSCS will be instructed to control all nuisance throughout the construction period. A monitoring programme will follow current licence requirements and continue to observe the set limits through the said monitoring programme.

The PSCS shall execute the works sympathetically to the surrounding environment, and will ensure the mitigation measures are suitable and effective.

There will be a comparatively moderate use of fuel, electricity, natural gas and potable water during the construction phase. Resources consumed will mainly include use of fuels for construction related machinery, electricity to light the construction site, and power construction tools and gas to

heat the buildings. The Proposed Development will specify a concrete mixture with 10% Cement replacement for foundations and beams (CEMII/A-V) and 60% Cement replacement for structural elements (CEMIII/A), equivalent to a saving of 23 kgCO<sub>2</sub>e per m<sup>3</sup> of concrete for foundations and beams, and 137 kgCO<sub>2</sub>e per m<sup>3</sup> for concrete slabs and frame elements.

The Proposed Development will specify the use of rebar which is made of 95% recycled steel, or equivalent. Additionally, the efficient design by the design team has also resulted in a 10% reduction in structural steel from the BAU scenario.

Recycled Class 6 aggregate will not be incorporated in any structural elements, but will be used to fill voids and landscaping purposes.

For the construction phase, the main focus will be on waste reduction, diverting waste from landfills, control of erosion and sedimentation and avoiding nuisance to the public.

On-site segregation of all waste materials will take place (see *Chapter 13 Waste Management*). It will be a priority to source materials from locations close to the site, where possible, in order to reduce transport distances.

A DMP and CEMP have been developed and detail the environmental controls to minimise demolition and construction effects. The appointed contractor will develop this further prior to demolition and construction. A traffic management plan will be put in place to mitigate the impacts of traffic movement of the R167 Strand Road, full details can be found in *Chapter 6 Traffic and Transportation*. Construction traffic movements will be limited to outside normal rush hours. Dust from traffic movements will be managed by the use of water sprays and wheel washes at the site exits. However the movement of heavy goods vehicles is expected to be less than experienced during full production at PPL.

#### 14.7.2 Operational Phase

The Proposed Development is being designed to move towards a carbon neutral project and incorporate extensive energy efficiency and sustainable measures. Specific mitigation measures will include:

- The European Energy Performance of Buildings Directive (EPBD) requires all new buildings to be nearly Zero Energy Buildings (nZEB) by 31<sup>st</sup> December 2020. An Energy Use Intensity (EUI) reduction, in comparison to Part L requirements is being targeted for the Data Centre (refer to AtkinsRéalis Engineering Report accompanying this planning application).
- The design centres around the ethos to minimise the embodied carbon of the construction, ensure maximum diversion of construction waste from landfill, and to ensure low emissions materials are used in construction and operation.

### 14.8 'Do Nothing' Scenario

If the Proposed Development does not go ahead, there will be no demolition, excavation or construction at this site.

As discussed in Section 1.9.5 of this EIAR, if the Proposed Development does not occur, the site will return to full production, and the site's requirements for the various material assets assessed in this Chapter will return to the levels as described for 2014 in Section 14.3.

The site is zoned for general employment, and it is possible that a development of a similar nature would be progressed on the site in the future.

Reference should be made to other chapters of this EIAR where the 'Do Nothing' scenario on certain material assets are discussed in detail (see Section 14.2.1).

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## **14.9 Residual Effects**

### **14.9.1 Construction Phase (including Demolition)**

With the mitigation measures outlined in Section 14.7.1 implemented, the residual effects of the Proposed Development on the material assets are likely to be short-term, neutral and imperceptible (in accordance with the EPA (2022) Impact Assessment Criteria set out in Table 1.5 of this EIAR).

### **14.9.2 Operational Phase**

With the mitigation measures outlined in Section 14.7.2 in place, the effects of the operational phase of the Proposed Development on the material assets are likely to be long-term, positive and significant (in accordance with the EPA (2022) Impact Assessment Criteria set out in Table 1.5 of this EIAR). The site will comply with the requirements of its Industrial Emissions Licence.

### **14.10 Difficulties Encountered**

There were no difficulties encountered in the preparation of this chapter.

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## 15 Archaeology, Architectural & Cultural Heritage

### 15.1 Introduction

This Chapter of the Environmental Impact Assessment Report has been prepared by Courtney Deery Heritage Consultancy Ltd on behalf of AtkinsRealis. The purpose of this chapter is to assess the potential significance and sensitivity of the existing archaeological and cultural heritage baseline environment and, in turn, to evaluate the likely significant effects of the proposed redevelopment of the Premier Periclase Magnesium Oxide and Hydroxide Production Facility into an energy campus on this environment. The assessment will examine the potential effects during the construction, demolition and operational phases of the development. This chapter also proposes mitigation measures to safeguard any monuments, features, finds of antiquity or features of archaeological or cultural heritage merit. A detailed description of the Proposed Development is provided in *Chapter 2 Description of Proposed Development* of this EIAR.

This chapter was prepared by Siobhán Deery BA, MA, H-Dip (Ed.), Dip Planning & Env. Law, MIAI, MICOMOS co-director and Senior Heritage Consultant at Courtney Deery Heritage Consultancy Ltd. She holds master's degree in Archaeology and Heritage from the University of Leicester (2010), and a higher diploma in education from Trinity College Dublin (1999), a Bachelor of Arts Degree in Archaeology and Geography from UCD (1996). She is a licence eligible archaeologist and is a member of the Institute of Archaeologists of Ireland since 2002. She also has Certificates in Archaeology & the Rural Environment (2003), in the Assessment of the Setting of Heritage Assets (2013) and in Condition Surveys of Historic Buildings (2013) from the University of Oxford. She has 23 years of experience as a cultural heritage consultant specialising in surveying and evaluating archaeological monuments, historic buildings, sites and landscapes for the purposes of conservation, environmental impact assessment, management and development control. The Chapter was compiled with assistance from Karen O'Toole, BA, MSc.

### 15.2 Assessment Methodology

The evaluation of the archaeological and cultural heritage resource of the Proposed Development was based on a desk study of published and unpublished documentary and cartographic sources, supported by a site inspection carried out on the 6th of March 2024.

The methodology has been designed so a full understanding of the potential effects on the character of the cultural heritage landscape can be assessed. A detailed archaeological and historical background has been included, which describes the character of the immediate and wider historic landscape, as well as the individual heritage assets, and highlights the potential to reveal subsurface features. The methodology used is based on the EPA Guidelines (2022), and both direct physical effects as well as effects on the setting of individual heritage assets have been assessed. There were no difficulties encountered in compiling this chapter.

By using all the different sources and data sets we have developed an understanding of the historic character that surrounds and is part of the Proposed Development.

The key activities that have the potential to result in likely significant effects on archaeology and cultural heritage are outlined below.

#### Demolition and Construction Phase

- Demolition, groundworks and site clearance works leading to the removal or part removal of a heritage asset;
- Ground disturbance and excavation, caused by construction activities (including service connections and diversions) which may lead to the damage or destruction / removal of recorded or previously unknown (newly revealed) heritage assets; and
- The degradation of the setting and amenity of a monument or the severance / fragmentation of interrelated features.

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## Operation and Maintenance Phase

- Operational activities may comprise maintenance activities, though the effect risk to recorded or previously identified archaeological features or cultural heritage assets is considered to be low;
- A change that negatively effects on a sense of place (i.e. detracts from the setting of historic features) and that cannot be mitigated has the potential to be considered a significant or profound impact throughout the operational life of the Proposed Development; and
- Potential visual effects on archaeological and cultural heritage features during the operational phase may be incurred as a result of the Proposed Development and result in a change in the character of the receiving historic environment. This change may have a positive or negative affect on the heritage asset.

### 15.2.1 Desk Based Assessment

The following sources (accessed between January 2024 and May 2024) were consulted as part of the paper study of the Proposed Development area:

- United Nations Educational, Scientific and Cultural Organization (UNESCO): properties inscribed on the World Heritage List and those nominated for inclusion on the tentative list ([www.heritagemaps.ie](http://www.heritagemaps.ie));
- Record of Monuments and Places and Sites and Monuments Record ([www.archaeology.ie](http://www.archaeology.ie));
- National Monuments in State Care Database ([www.archaeology.ie](http://www.archaeology.ie));
- Preservation Orders List ([www.archaeology.ie](http://www.archaeology.ie));
- Register of Historic Monuments ([www.archaeology.ie](http://www.archaeology.ie));
- Topographical files of the National Museum of Ireland (paper files of the National Museum of Ireland);
- Cartographic sources ([www.archaeology.ie](http://www.archaeology.ie), [www.downsurvey.tchpc.tcd.ie](http://www.downsurvey.tchpc.tcd.ie), [www.logainm.ie](http://www.logainm.ie));
- Written sources relating to the study area (see 15.11, Chapter Bibliography);
- Satellite Imagery (1995, 2000, 2005, OSi Ortho and Digital Globe: [www.archaeology.ie](http://www.archaeology.ie), (2019-2003:[www.googleearth.com](http://www.googleearth.com));
- Excavations Bulletin (1970-2022) ([www.excavations.ie](http://www.excavations.ie));
- Place Names ([www.Logainm.ie](http://www.Logainm.ie), [louthfieldnames.wordpress.com](http://louthfieldnames.wordpress.com) and paper sources);
- Protected Structures listed in the Louth County Development Plan 2021-2027 ([www.louthcoco.ie](http://www.louthcoco.ie)); and Meath County Development Plan 2021-2027 ([www.meathcoco.ie](http://www.meathcoco.ie)); and
- National Inventory of Architectural Heritage ([www.archaeology.ie](http://www.archaeology.ie)).

A description of these sources is provided in Appendix E of this EIAR. Other sources of information of documentation and research are included in the bibliography in Section 15.15.

There have been no data limitations in relation to cultural heritage that would have implications for the conclusions of the assessment.

### 15.2.2 Field Inspection

Field inspection is necessary to determine the extent and nature of archaeological, architectural, and historical remains. It can also lead to the identification of previously unrecorded or suspected sites and portable finds through topographical observation and local information. The cultural heritage field inspection was carried out on March 6, 2024. Full access was provided, and no difficulties were encountered.

### 15.2.3 Consultation

A request for consultation with the National Monuments Service (NMS) of the Department of Housing Local Government and Housing (DHLGH) was submitted to the DAU (preplanning



reference number G Pre00138/2024). A draft copy of the EIAR Chapter and the Proposed Development layout drawings were reviewed by the NMS. This was followed by a meeting on-site on the June 19, 2024 with the Siobhán Deery and a representative of Premier Periclase who facilitated full access to the site.

In relation to the Proposed Development site the NMS have responded as follows:

- The site of the Proposed Development is located within a landscape that has proven itself to be rich in both recorded and previously unrecorded archaeological sites and is located within the wider Boyne Valley environment, which is a highly significant archaeological landscape,
- That the site of the Proposed Development is located within close proximity to the following recorded monuments: LH024-094001: Field system, LH024-094: Concentric enclosure and LH025-003001: Church, and
- That the results of a recent archaeological gradiometer survey carried out under licence (23R0172) identified a complex enclosure LH024-094---- LH024-094001- and associated field systems LH024-094001- adjacent the site to the north. The field systems appear to extend into the site of the Proposed Development.

Having reviewed the draft Cultural Heritage chapter, together with the detailed site plans and the findings of the site inspection, we understand that the Department concurs with the recommendations in the report. Because of the nature of the Proposed Development and the levels of ground disturbance associated with the original development of the Premier Periclase site, the Proposed Development appears to have very little potential to impact previously unrecorded archaeological features and deposits. This opinion is subject to review in light of the final EIAR and this chapter, and as such, it does not prejudice the recommendations given by the NMS, which may seek additional information or consider alternative strategies.

### 15.3 Guidance and Legislation

The archaeology and cultural heritage assessment has followed the methodology set out in the EPA Guidelines (EPA, 2022). The following legislation, standards and guidelines were also consulted as part of the assessment.

- Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023;
- National Monuments (Amendments) Act, 1930 (as amended);
- The Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023; The Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 was enacted in October 2023, and while this Act is now law, its provisions will not enter into force until the Minister for Housing, Local Government and Heritage has made one or more Commencement Orders. This means that the National Monuments Acts remain in force.
- The Planning and Development Acts, 2000 (as amended);
- Planning and Development Regulations 2001 (as amended)
- Heritage Act, 1995 (as amended);
- Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), 2003, EPA ;
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports 2022, EPA;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht, and Islands;
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Local Government (Planning and Development) Act 2000;
- UNESCO World Heritage Convention, 1972;

- ICOMOS Xi'an Declaration on the Conservation of the Setting of Heritage Structures, Sites and Areas, 2005;
- Council of Europe Convention for the Protection of the Architectural Heritage of Europe (Granada) 1985, ratified by Ireland in 1991;
- Council of Europe European Convention on the Protection of the Archaeological Heritage (Valletta) 1992, ratified by Ireland in 1997;
- The Burra Charter, the Australia ICOMOS Charter for Places of Cultural Significance 2013;
- *The European Landscape Convention* (ELC), ratified by Ireland 2002. (The Department of the Environment, Heritage and Local Government 'Landscape and Landscape Assessment Guidelines' have been in draft form since 2000, however the Draft National Landscape Strategy (NLS) was launched in July 2014);
- *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* – A publication of the International Council on Monuments and Sites, January 2011;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht and Islands;
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000;
- National Landscape Strategy for Ireland 2015-2025, Department of Arts, Heritage and the Gaeltacht;
- Guidelines for the Assessment of Architectural Heritage Impact of National Road Schemes, 2006, NRA;
- Guidelines for the Assessment of Archaeological Heritage Impact of National Road Schemes, 2006, NRA;
- Guidelines for the Testing and Mitigation of the Wetland Archaeological Heritage for National Road Schemes, 2006, NRA; and
- *National Landscape Strategy for Ireland 2015-2025*, Department of Arts, Heritage and the Gaeltacht;
- Historic England (July 2015), *Historic Environment Good Practice Advice in Planning*, Note 3: The Setting of Heritage Assets;
- Historic Scotland (October 2010), *Managing Change in the Historic Environment*; and
- The Heritage Council (2010), *Proposals for Irelands Landscapes and International Council on Monuments and Sites* (2011).

## 15.4 Study Area

The proposed Boyne Energy Campus proposes to redevelop the existing Premier Periclase Magnesia and Magnesium Hydroxide Production Facility. The site lies just under 1.5km from the historic core of Drogheda town (RMP LH024-041) (Figure 15.1). It lies in the townland of Newtownstalaban in the barony of Ferrard and in the parish of Tullyallen, on the northern banks of the River Boyne Estuary.

In 1938, a cement factory was opened on the site, and in 1978, it was developed into a seawater Magnesia plant and remains operational. Presently, this area along the riverfront is predominantly industrial in character, whereas to the north, it is agricultural. New residential development has extended across the area to fill the greenfield gaps between the town and the site.

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**Figure 15.1:** Site Location

To understand and characterise the character, context and significance of the cultural heritage landscape, the baseline desk study took account of all designated archaeological and architectural heritage sites within a 1 km radius of the Proposed Development. This 1 km Cultural Heritage study area is wide enough to assess the immediate archaeological, architectural and cultural heritage potential of the Proposed Development. Professional judgement was used to determine where the study area should be extended to consider archaeological sites/monuments or historic structures that lie beyond its boundaries.

A seawater reservoir in Baltray and a freshwater reservoir in Mell Quarry are associated with the existing production facility. As no works associated with the Proposed Development will occur outside of the site in the sea or the river Boyne or for the existing connections to the Proposed Development site these areas were not examined in any further detail in this chapter. Water abstraction will, however, continue at both sites.

As required and where appropriate, the relationships of structures, sites, monuments, and complexes outside this Cultural Heritage study area were considered and evaluated. This methodology has ensured that a robust assessment has been undertaken on all recorded cultural heritage assets within and in proximity to the Proposed Development and that the likely significant direct and indirect effects are considered.

## 15.5 Receiving Environment

### 15.5.1 Archaeological, Architectural, Cultural and Historical Background Prehistoric Period

While there is no direct archaeological evidence for prehistoric settlement within Drogheda town, numerous stray finds have been uncovered (Bradley 1984), including stone axes from the Neolithic period (c.4000–2000 BC) and bronze weapons and decorated pottery vessels, the latter accompanying burials, from the Early Bronze Age (2000–1200 BC). The stray finds recovered from the town suggest that the site of the present town may have been a fording point and, at the very least, the area had been explored and intermittently occupied at various stages throughout prehistory.

Investigations to the west of Drogheda, resulting from infrastructural works, have highlighted the potential of Co. Louth and especially the Boyne Valley to yield both Neolithic and Mesolithic artefacts and structures. These included Neolithic activity at Coolfore (Ó Drisceoil 2000) and Old Bridge (Campbell 2000) and further south at Paltin (Seaver 2000), all of which point to wide-spread Neolithic activity on either side of the River Boyne. In addition, there is evidence of a continuity of activity from the Neolithic to the Bronze Age within this region of Louth and Meath. This includes such complexes as Rathmullen (Bolger 2000) and Mell (Breen 2000, Campbell 2000).

In Baltray, c.3km from the Proposed Development area, are a pair of standing stones (RMP LH025-002) dating to the Bronze Age, their erection was not an isolated event but rather would have been a meaning-laden activity within a broader landscape which has been populated since the Neolithic. The pair of stones are located within a coastal/estuary landscape, which lay downstream from a zone of Neolithic activity to the west of Drogheda. It is suggested that these stones mark the southern limits of the province of Ulaid and are held in legend to be the location where the mythical character Cúchulainn killed his only son Connla (<http://www.mythicalireland.com>).

Recent archaeological investigations have also uncovered greater settlement activity in the wider vicinity of the Proposed Development site during the Bronze Age. These include the identification and excavation of two burnt mounds (Russell, Licence No.: 06E1126; Russel, Licence No.: 08E0765; Russell, Licence No.: 08E0766) in the neighbouring townland of Yellowbatter to the north-west of the Proposed Development. A ring-ditch and two cremation pit burials (Stirland and Gallagher, Licence No.: 18E0733) were also excavated in Yellowbatter. Pottery sherds and radiocarbon dating of the site indicated that the area was in use intermittently from the Early to Late Bronze, highlighting a relative continuity of activity in the vicinity during these periods.

### **Early Medieval Period (AD 500–1100)**

While no direct evidence for Norse settlement or activity in and around Drogheda has been found, the River Boyne was an important waterway utilised, along with the other major rivers, by the Norse to penetrate the inland waterways of Ireland during the ninth century. It is believed that the founder of the town of Drogheda was a Norse Chieftain called Thorgestr in 911. There are references in various historical sources to Norse fleets using the Boyne in the 9th century; however, a permanent Norse settlement, or longphort, at Drogheda seems unlikely because of its close proximity to the royal centre for the kings of North Brega at Knowth (Bradley 1978). Drogheda is located on the lowest bridging point of the Boyne River and it must have been seen as a convenient location for trade and travel. This factor gave also Drogheda its name; the Irish for Drogheda is *Droichead Atha*, which means the bridge at the ford.

The area immediately around present-day Drogheda contains a number of sites, some of status, from the Early Christian period (c.400–800 AD). Ringforts, ecclesiastical sites and souterrains are recorded to the north and south of the town, and, according to local tradition, at least four possible souterrains were believed to have been located within the town in Moneymore townland (Buckley & Sweetman 1991, 43). The town and the Proposed Development site are also near the early medieval ecclesiastical centres of Monasterboice (RMP No.: LH021-062001) and Termonfeckin (LH022-041002). A number of stray finds dredged from the River Boyne, such as double head spiral pin (7<sup>th</sup>-8<sup>th</sup> century) and five bronze stick pins (10<sup>th</sup>-12<sup>th</sup> century) demonstrate that the area may have been quite wealthy during this time (Kieran and Hayden 2009, 7).

There are two enclosure sites surrounded by field systems in the townland of Newtownstalaban (RMP No.: LH024-074 and LH024-094); they may be ploughed out examples of ringforts, particularly given that the surrounding field systems, though a prehistoric origin (such as barrow sites, etc.) cannot be ruled out. Enclosure sites are areas defined by an enclosing element (e.g. bank, wall, fosse, scarp) or indicated as such cartographically and occurring in a variety of shapes and sizes, possessing no diagnostic features which would allow classification within another monument category. An enclosure site (RMP No.: LH024-094) is located in the field immediately to the north of the Proposed Development area; it was identified as a result of a geophysical survey (Ref: 23R0172, Figure 15.11 below). The enclosure was defined by three roughly concentric fosses (Murphy 2023 after RMP file). There are field drains defining field systems (RMP No.: LH024-094001) extending from the site to the south and attached to the inner subcircular enclosure. Some



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other field drains are attached to the largest enclosures in the northeast and southeast. There are straighter drain features to the east of the enclosure, which are possibly unmapped post-medieval field systems. The enclosures and field drains are cut by a service road to the Proposed Development area.

Approximately 240m north of the Proposed Development area, enclosures and linear features are visible as crop marks were identified on a Digital Globe aerial photograph (taken 13 July 2011; SMR file). A smaller inner sub-circular enclosure (diam. c. 44m E-W) is tangentially situated within and at the west edge of a larger enclosure (diam. c. 75m), which, in turn, is abutted by remnants of other linear features and small field-like enclosures probably indicating a field system (RMP No.: LH024-074001-). The features are also visible on Map Genie (1995) (RMP files).

### **Medieval Period (AD 1100–1600)**

Most of the towns built in Ireland between 1180 and 1300 were established by the Anglo-Normans and Drogheda is no exception (Bradley 1978, 102). The Millmount motte (RMP No.: LH024-041009) in the southern half of the town and St. Peter's Church (RMP No.: LH024-041004) in the northern half were both established by Hugh de Lacy before 1186 (Bradley 1978, 105), although the earliest charter places the formal establishment of the town by Walter de Lacy, Hugh de Lacy's oldest son (Beresford 2009), in 1194. The town as we know it today originally existed as two separate towns – one on the north bank of the River Boyne in Louth and the other on the south bank of the river in Meath. The lands on either side of the river are very different in their topography, which also influenced the development of the town(s). The southern bank consists of a steep scarp that reaches a height of more than 30m which made it an ideal defensive site, while the southern bank has a gentler gradient and a more level land surface which meant it was better suited to the construction of houses and an extensive quayside. The town was eventually united under a single charter in 1412 (Bradley 1978, 105).

In the thirteenth century, the town was walled, as evidenced by a series of murage grants issued to the town. In fact, Drogheda has one of the most extensive series of murage grants for any Irish town, with at least thirteen grants issued between 1234 and 1424. The grants consisted of a licence to levy a toll (called murage) on goods coming into the town, and the money collected was then used to build the walls (Bradley 1978, 118). The enclosed area of Drogheda town comprised 113 acres, making it one of the largest towns in medieval Ireland (Bradley 1978, 106).

Agricultural produce was the major export of the medieval town, and Drogheda acted as a marketplace for much of the surrounding countryside. Goods were carried up the River Boyne as far as Trim and the murage grants indicate that oxen, horse, sheep, pigs, wheat, rye, barley, oats, butter, cheese, apples, salmon, eels and fish were sold in the town. Drogheda was also an industrial centre, with records showing the town was an important ship-building centre (Bradley 1978, 123). There are also a number of pottery kilns (SMR/RMP No.: LH024-041086 and LH024-041045), lime kilns (SMR/RMP No.: LH024-041073 and LH024-041047), a corn-drying kiln (SMR/RMP No.: LH024-041074) as well as a number of other kilns (LH024-041108; LH024-041052; and LH024-041084) in the town, which also demonstrate the industrial nature of the town at this time. Suburbs were recorded in the north and east of the town in the 14th century (Kieran and Hayden 2009, 10), and the Proposed Development site may have been a part of these suburbs or the hinterland of the medieval town.

There was also a strong ecclesiastical presence in the town, perhaps due to its proximity to the large monastic sites of Monasterboice, Termonfeckin (previously mentioned) and later Mellifont Abbey, which was established in 1142 (Kieran and Hayden 2009, 7). Three religious houses are recorded in the medieval town, two in the north and one in the south. The Abbey and Hospital of St Mary d'Urso (SMR/RMP No.: LH024-041120) was established between 1206-14 in the northern half of Drogheda by Ursus de Swemele for the Crutched friars (Fratres Cruciferi) in order to help the sick of the town. It was located outside of the west gate of the medieval town and, at the time of the Suppression in 1540, it owned considered land and property in Drogheda and throughout the county of Louth. The site is depicted as ruins in Newcomen's 1657 map.

Nearby, an Augustinian friary was established during the reign of Edward I, sometime between 1272-1307. An Irish chapter of the Order was held here in 1359 and the Observant rule was



introduced in 1517. Today, the upstanding remains of the friary consist of the nave, chancel and western gable of the church building, as well as the central bell-tower.

In the south of the medieval town, a Carmelite friary of the Blessed Mary of Mount Carmel was also founded during the reign of Edward I (c. 1272-1307). It was later enlarged sometime after 1309 and was known as St Mary the Virgin around 1467-68. At the time of the suppression in 1540, it was already demolished. Archaeological testing around the area identified a part of the precinct, which is now preserved under a modern development (Kyle, Licence No.: 08E0031).

The ruins of a Late Medieval church, *Teach Liobáin* (RMP No.: LH025-003001), and graveyard (RMP No.: LH025-003002) are found in agricultural land just outside the area of the Proposed Development site (c. 65 m north at the eastern end) in the townland of Newtownstalaban, it is accessed via a narrow laneway which runs along the eastern end of the northern boundary of the Proposed Development area. The name '*Teach Liobáin*' is derived from St Libhear, who succeeded St Cainneach or Canice as abbot at the sixth-century monastery of Aghaboe in County Laois (Ó Riain 2011, 396-7). The name is attested in a charter of Mellifont abbey (RMP No.: LH023-027002-) in 1203 (Garry 1977, 59-60), and the abbey still held land at 'Stalebon' at the suppression in 1540 (White 1943, 215). The church is not mentioned in that inquisition, so it might already have been derelict, and it is described as a ruin on Taylor and Skinner's map of County Louth in 1778. Featureless portions of the east and west gables of a simple rectangular church (max. dims 10m x 5m) survive. There is no evidence of a doorway in the west gable which may indicate that it was a late medieval church. A stoup which had been kept nearby at Newtown House and is now in the Millmount Museum (RMP No.: LH024-04119-) is probably from this church (Campbell 2019, after RMP file).

Approximately 1km northeast of the Proposed Development is the site of a late thirteenth-century church (RMP No.: LH025-004) located in a field known as 'Church Field' to the north of a nineteenth-century church in Beaulieu. There are also records of a church founded by the Plunkett family in the thirteenth century at this location (Buckley and Sweetman 1991). Two grave slabs are in the present church, one representing a cadaver of mid-fifteenth-century date and the other a Norman type with a floriated cross (CLAJ 1944, 277; CLAJ 1980, 276).

There are two medieval churches on the southern side of the River Boyne in the townland of Stragrennan (ME020-006) and Mornington (ME021-001001) which also demonstrates the considerable ecclesiastical presence outside of the town in the area at the time.

### **Post-Medieval Period (AD 1600-1900)**

During the English Civil Wars of 1641, Drogheda was besieged and successfully defended by Sir Henry Tichbourne (Tichburne) (Kieran and Hayden 2009,10), who would later go on to establish Beaulieu House (SMR/RMP No.: LH025-006; RPS LHS0025-002), located c.890m east of the Proposed Development area. Sir Henry Tichbourne, who was defending Drogheda while under siege, led an attack in which 350 foot-soldiers and two troops of horses escorted some carts that were meant to bring in corn from the nearby townland of Greenhills. In Newtownstalaban, on the shore of the Boyne, they encountered the enemy and successfully defeated them with the loss of 200 of their force. Tichbourne was equally successful in another attack towards '*Bewly*' (Beaulieu), in which he burned down the village of Newtown, where the soldiers of Sir Phelim O'Neill were camped (Dalton 1844) In 1649, Drogheda was captured by Cromwell and in 1690, after the Battle of the Boyne, the town surrendered to William of Orange (Kieran and Hayden 2009, 10).

With the ending of the Williamite Wars in the late 17th century, Ireland entered a new era of relative political calm; from 1691 until the Rebellion of 1798 there were few dramatic events and a century of peace. Without concern for defence, landowners commenced the building of new mansions, and an era of experimentation of new architectural styles and larger, more comfortable houses became the norm. This is especially true of Beaulieu House, which was one of the first Irish country houses to be built without fortification.

Beaulieu House, c.890m to the northeast of the Proposed Development, was the residence of the senior branch of the Plunkett family; it later came into the hands of Tichbourne, who in April 1650 secured a Custodium Order for Beaulieu house and lands. Later the lands were granted under

instruction from Cromwell to Sir Robert Reynolds. However, the Tichbourne family remained in occupation during the course of a number of petitions by Tichbourne's son for the return of the lands.

The initial construction of the mansion house may have been conducted during William Plunkett's ownership, with further additions made in the 17th century by Tichbourne (O'Sullivan 1999). However, Buckley and Sweetman (1991) point out that the current building was constructed at the location of the Plunkett manorial house in the seven-year period leading up to 1667. Construction was instigated by Sir William Tichbourne following Wren's design.

In the eighteenth and nineteenth centuries, the textile industry was Drogheda's most important industry and is cited as the leading factor in the growth, both in size and in wealth, in the late 1700s (Fitzgerald 1981, 36). The most important textile produced was linen, but cotton, though less important, was also manufactured. Two former Drogheda mills are registered as protected structures and architectural heritage within the vicinity of the Proposed Development site, the Boyne Mill (cotton; RPS No.: DB-177) and the water mill on the Strand Road (linen; RPS No.: DB-339), reinforcing the importance of this industry at the time. Both milled and un-milled grain were also significant exports in this period, and towards the end of the 1780s, Drogheda was exporting more grain than any other port in Ireland, including Dublin (McHugh 2006, 176).

The decline of the linen industry and the onset of the Famine hit the town and its surroundings hard (Fitzgerald 1981, 43; McHugh 1986, 177), but the port retained its significance into the twentieth century.

### **Modern Industrial Development of the Site**

The Cement Act was established in 1933, providing the legal framework to form a cement industry in Ireland. The aim was to establish a stable, self-sufficient home industry to meet the developing State's increasing demand for cement. The State approved the first cement licence in 1934, and in May 1936, Cement Limited was registered as a Limited Liability Company<sup>167</sup>. On the 23rd of May 1938, Sean Lemass, then Minister for Industry and Commerce, officially opened the cement factory on the Boyne Road in Drogheda. Most of the equipment came from Denmark, with the exception of fire bricks from Canada to line the kilns and American trucks for hauling at the quarries (Harris and Trought 1954). The revised 1948 edition OS map shows the extent of the new 'Cement Factory' at that time (Figure 15.2).

<sup>167</sup> <https://www.irishcement.ie/about/history-of-cement/>

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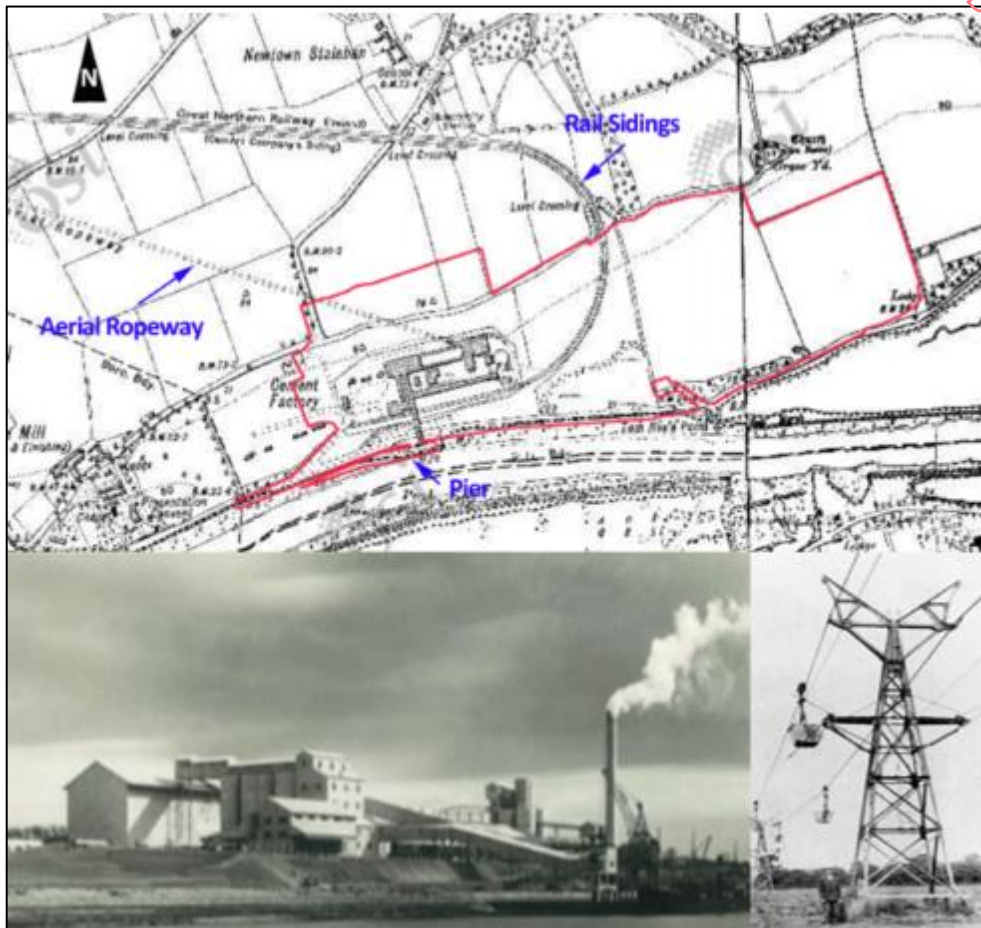


**Figure 15.2:** Cement factory in c. 1948, as depicted on the 6-inch OS map. It shows the line of the aerial ropeway and the rail sidings. Inset: view of the factory from the opposite side of the River Boyne of the factory and the now removed aerial ropeway<sup>168</sup>

Limestone and shale, raw materials for cement manufacture, were transported from a quarry in Mell, northwest of Drogheda via a continuous line of large buckets transported on an aerial bi-cable ropeway to the cement mill (See inset in Figure 15.2). The ropeway travelled for c 3.4km through the townlands of Moneymore, Yellowbatter, Greenbatter and Newtownstalaban, it comprised steel lattice towers and lines which held large steel buckets (and later of aluminium). It travelled over the Belfast-Dublin Road (North Road), the Bog Lane, Twenties Lane, Roches Lane, Ballymakenny Road, Mullins Lane (all in Moneymore townland), the main Belfast-Dublin line, the spur line to Cement Limited, the Newfoundwell Road, Newtown Road and the Cemetery Lane (all in Newtownstalaban townland) (Garry 1990). The ropeway had both carrying and haulage ropes. The steel-wire haulage rope was driven by a 75 hp motor at the factory end. The ropeway had a capacity of 150 tons per hour. At full speed, the round journey from Boyne Road back to Boyne Road took one hour and three minutes. On 20 January 1978, the ropeway closed down and in almost forty years, carried 21,580,937 tons of crushed limestone and shale (*ibid*).

The company had its own rail sidings and a pier on the Boyne River. In 1933, the Great Northern Railway built a 2km branch line to the Boyne Road Cement Factory the 'Cement Company's Siding'. The branch diverged from the main Dublin to Belfast line just north of the Boyne Viaduct at 'Cement Branch Junction' and curved sharply southeast through Newtownstalaban to serve the cement factory, and an additional oil terminal. The train connection included an oil fuelling station that was constructed sometime during the 1950s or 60s when the factory switched to oil burning

<sup>168</sup> <https://www.irishcement.ie/irish-cement-1938-2018/> Irish Cement – Celebrating 80 years January 22, 2018 (accessed 25/03/2024)

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and used to transfer oil from tanker wagons through piping to large oil silos to power the factory and the cement loading sidings themselves, which went inside and around the factory. In 1954-5 the railway designed and built 150 wagons of 16 tons capacity exclusively for cement haulage. Twelve of these were of the hopper type for bulk traffic, and the remainder were modern covered wagons for bag traffic.<sup>169</sup> The branch line was heavily used by the GNR and later CIE, and latterly included a ballast loading point at Newfoundwell.

In 1977, a new cement factory west of Drogheda opened in Platin, which became the primary source of cement traffic in the area. The 'Boyne Road Cement Factory' on the branch meanwhile declined in rail traffic, and by the early 1980s, only the oil terminal was occasionally served by trains. By the mid-1990s, only the section of the branch to the Newfoundwell ballast sidings was in use, primarily used for the re-ballasting of the main Dublin to Belfast line. By 1996, the ballast sidings were no longer required, and Irish Rail removed the connection to the mainline at the Cement Branch Junction, after which the branch was lifted as far as Newfoundwell. The remaining, and now isolated, section of the branch to the Boyne Road Cement Factory and the oil terminal is derelict, heavily overgrown and inaccessible. In the field to the north of the Proposed Development site, the rail sidings appear as curving hedgerows. There is also an indication of the track within the subject site (see field inspection below).

In 1978, the cement factory closed, and Premier Periclase opened its production of magnesia and magnesium hydroxide products, its location providing direct access to seawater and limestone raw materials, having its own wharf facility within the port of Drogheda.

## 15.5.2 Cartographic Sources

### ***William Petty, Down Survey Map, Barony of Ferrard, 1656***

The earliest representation of Drogheda town comes from the sixteenth century, although Barnaby Goche's map of 1574 is not so much an accurate cartographic source as a sketched impression of the town at that time. The map does not extend beyond the walled town into the study area. The earliest map sourced for the study area is the Down Survey Map of 1656 (Figure 15.3). Once more, this is not an exact map, but it does indicate the walled town of Drogheda well, as well as its principal buildings, with a bridge connecting the two sides of the town.

The townland of *Newtonne Stalabane* (Newtownstalaban) is labelled. There is a road that runs northwest to southeast through the townland to the river Boyne, the northern part of which is likely to be the present-day Newtown Road. On either side of this road in the centre of the townland, there are at least seven small structures which may represent Newtown village. There is a large structure shown in the townland to the east of the road and north of the village; it comprises a tall tower-like structure with a smaller annexe adjoining it; it is reminiscent of how tower houses are represented on the Down Survey Maps. There is no record of a tower house in the townland, but given its location, it might suggest that there may be earlier origins to Newtown House or, indeed, may represent a site that has been lost to time. To the east is the townland of Beaulieu; Beaulieu House is shown as a large mansion with high-pitched roofs and tall chimneys with a large wall surrounding it. No further information can be gleaned from the map source for the Proposed Development area, which is shown as a featureless area.

<sup>169</sup> Cross Border Archives Project - Online Exhibitions - Great Northern Railway (louthnewryarchives.ie)



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**Figure 15.3:** Extract from the Down Survey Barony Map (c. 1655) of the Barony of Ferrard and approximate site location

***Wren's Topographical Map of the County of Louth, 1766***

Wren's map (Figure 15.4) shows greater detail than the latter map source. It includes the village of 'New Town', which comprises a number of small properties with associated plots of land; to the east, 'Green Hills' is also marked. Beaulieu House is shown with its decorative avenues and gardens. No features are shown within the area of the Proposed Development site, or along the northern banks of the river. The road shown on the latter map sources no longer runs to the river but continues into Drogheda town.



**Figure 15.4:** A Topographical Map of the County of Louth, Matthew Wren, 1766 and approximate site location



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### **Taylor and Skinner map, 1778**

The road maps of Wren and Taylor & Skinner (Figure 15.5) are similar in appearance as they both illustrate the road network that runs through the study area and the rivers and some topographical features and houses that align the roads. The town's expansion outside the city walls in the intervening years since the Down Survey map is evident along the roads leaving the towns. On this map, Newtownstalaban is simply referred to as Newtown. The medieval church north of the Proposed Development area (RMP LH025-003001) is described as a ruin – 'Ch Rs'. A road runs from Newton south to the church and turns east towards Greenhills. An informal track/path is shown to run from Newtown, through the study area, to the river's edge, possibly the remnants of the earlier road shown on the earliest map source; there is a rectangular structure at the end of it. A natural ridge runs roughly east-west through the Proposed Development area, indicating that it is on higher land than the surrounding landscape. A road is also indicated along the northern banks of the river. No other features are shown within the Proposed Development area.



**Figure 15.5:** Taylor and Skinner map, 1778, showing the approximate location of the Proposed Development area.

### **First Edition Ordnance Survey Map, 1843, scale 1:10,560**

The Ordnance Survey (OS) six-inch map of 1835 provides the most accurate and to-scale mapping of the study area for the first time (Figure 15.6). On this map, the village of 'Newtown Stalaban' is shown; it comprises a number of structures and plots of land on the west of a triangular space formed by the junction of Newtown Road and the entrance to Newtown House. In the village, an R.C. Chapel is indicated. In Lewis's Topographical Dictionary of Ireland, 1837, Newtown-Drogheda is described as

*'a village, in the parish of Tullyallen, barony of Ferrard, county of Louth, 2 miles (N.E.) from Drogheda near the road to Termonfeckin; containing 24 houses and 126 inhabitants. It was formerly a chapelry belonging to the abbey of Mellifont but is not now noticed in the ecclesiastical divisions: it is in a detached portion of the parish, near the river Boyne, and separated from the main body of the county of the town of Drogheda. Here is one of the three R.C. chapels belonging to the district of Tullyallen; and in the demesne of Newtown, immediately adjoining the village, are some vestiges of the ancient church. Newtown House, a handsome residence, is the seat of some of the ancient church. Newtown House, a handsome residence, is the seat of Geo. Smith Esq., is in the vicinity'.*

Newton House comprises a small demesne, the main house and stable buildings, decorative gardens, parkland, deep shelterbelts of trees and a decorative pond are all indicated. The medieval church (LH025-003001) of *Teach Liobáin* is indicated as a 'Burial Ground, Ruins' on the map; there is a track leading south to it from Newtown House, and another path approaches the church from the west from Drogheda, which runs through the Proposed Development area. There is also access to the river from this lane through the Proposed Development area.

The subject site comprises a number of fields on the northern banks of the river; two small gravel pits are indicated within it. The townland boundary between Newtownstalaban and Beaulieu forms the eastern boundary of the Proposed Development area; this bounds the southwestern corner of Beaulieu Demesne and comprises a large irregular field with deep forested shelterbelts to the east, beyond which are large decorative ponds within woodland.



**Figure 15.6:** Extract from the first edition 6-inch OS map (1837) showing the Proposed Development area.

***Revised 25-inch OS map Edition Ordnance Survey Map, 1907***

There was little change between the 1843 and 1907 OS Map editions when the 25-inch map revision was drawn up (Figure 15.7). The only significant change in the study area was the increase in gravel extraction, with a very large gravel pit indicated in the central southernmost area of the site. A new gate lodge was constructed at the southwestern corner of Beaulieu Demesne.

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**Figure 15.7:** Extract from the 25-inch OS map (1907) showing the Proposed Development area  
**Revised OS Map, 1948**

In the 1948 OS map (as shown in Figure 15.2 above), there has been a significant change within the subject site; its character entirely changed from a rural to an industrial one. The cement factory was constructed on the southwestern corner of the site in 1938. The factory's footprint is large in scale, comprising large, interconnected structures; it is accessed from the north and south of the site and, as mentioned above, is well-served by all forms of transport, such as roads, aerial ropeway, rail sidings and pier, as depicted.

### 15.5.3 Summary of Previous Archaeological Excavations

A review of the Excavations (1970-2023) database has revealed a number of previous archaeological investigations in the vicinity of the Proposed Development to the north of the Boyne River (Table 15.1, Figure 15.8).

In Newtownstalaban, the townland in which the Proposed Development is located, there have been a number of phases of test excavations and monitoring. Archaeological monitoring in 2004 (Clarke, Licence No. 04E1108), and test trench excavations in 2017 (Clarke, Licence No. 17E0652), 2021 (O'Connell, Licence No. 21E0019), and 2023 (Murphy, Licence No. 23E0409) identified no features or deposits of archaeological significance. In 2006, test excavation in advance of a port access road exposed a cemetery, including three identified graves and a further twenty possible graves (Russell, Licence No. 06E1126). The route of the proposed road was later realigned, and the full extent of the cemetery appears to lie outside of the route, towards the west and southwest.

In the neighbouring townland of Yellowbatter (moving west towards Drogheda), the 2006 test trenching also identified a burnt mound and a burnt spread, which were later fully excavated in 2008 (Russell, Licence No. 08E0765 and Russell, Licence No. 08E0766) although neither site appears to be securely dated. Elsewhere in Yellowbatter, human remains were recovered in 1951 during the clearance of a building site, although the site was not investigated further, and the chronology of the remains is uncertain (NMI Burial Excavation Records, SMR No. LH024-073). Monitoring, test trenches, and excavations in the townland in 2018 and 2019 identified activity dating to the Early – Late Bronze Ages in the form of a ring-ditch and two inverted urn cremations (Stirland and Gallagher, Licence No. 18E0733).

Excavations nearby in 2022 also identified Middle-Late Bronze Age activity consisting of a ring-ditch with associated features including a ditch, a well, and pits and recovered finds, including an amber bead and pottery sherds (Cosgrove, Licence No.: 22E0503). The same excavation also identified early medieval activity in the form of two enclosures and associated features, including ditches, a souterrain, a well, pits, kilns, slot trenches and post holes. Test trenches in 2021

identified a ringfort ditch and associated pits (Murphy, Licence No. 18E0550), further representing medieval activity in the townland.

In recent years, a number of test excavations in Yellowbatter have identified archaeological features and deposits that have been recommended for full excavation and preservation by record, but the results of these are not yet available. Test trenching in 2021 also identified linear features and a pit which were recommended for preservation by record (Russell, Licence No. 18E0550). Similarly, test excavations carried out in 2022 identified archaeological ditches, field systems, a pit, a cluster of features and burnt mound material (Piera, License No. 22E0121) and also recommended for preservation by record through archaeological excavation. Finally, a boundary ditch identified during test excavations in 2023 was also recommended for full excavation and preservation by record (Murphy, Licence No. 23E0175).

There have also been many archaeological investigations in Yellowbatter where no features of archaeological interest have been identified. These include periods of monitoring in 2018 (Murphy, Licence No.: 18E0550; Gallagher, Licence No.: 18E0551), 2019 (Clarke, Licence No.: 19E0487), 2020 (Clarke, Licence No.: 20E0547), and 2022 (Whitaker, Licence No.: 22E0340).

To the east of the Proposed Development, in the neighbouring townland of Beaulieu, archaeological monitoring (O'Connell, Licence No.: 12E0289) and test excavations (O'Donnell, Licence No.: No.: 01E0489) did not identify features or deposits of archaeological significance.

**Table 15.1:** Archaeological Investigations in the vicinity of the Proposed Development area

| Licence No. | Townland                         | Type                                    | ITM E  | ITM N  | Findings                                                                            |
|-------------|----------------------------------|-----------------------------------------|--------|--------|-------------------------------------------------------------------------------------|
| 04E1108     | Newtownstalaban                  | Monitoring                              | 710591 | 776304 | No archaeological significance                                                      |
| 06E1126     | Yellowbatter and Newtownstalaban | Test excavation                         | 676844 | 807380 | Three burnt mounds and a cemetery (ITM co-ordinates appear to be incorrect)         |
| 17E0652     | Newtownstalaban                  | Test excavation                         | 710370 | 776790 | No archaeological significance                                                      |
| 21E0019     | Newtownstalaban                  | Test excavation                         | 710741 | 776565 | No archaeology found                                                                |
| 23E0409     | Newtownstalaban                  | Test excavation                         | 710666 | 776868 | No archaeology found                                                                |
| 08E0765     | Yellowbatter                     | Excavation                              | 708087 | 777641 | Burnt mound, including two pits, two sub-rectangular troughs, and one possible pit. |
| 08E0766     | Yellowbatter                     | Excavation                              | 708647 | 777801 | Burnt spread                                                                        |
| 18E0550     | Yellowbatter                     | Monitoring                              | 708981 | 777241 | No archaeological significance                                                      |
| 18E0551     | Yellowbatter                     | Monitoring                              | 708350 | 777162 | No archaeological significance                                                      |
| 20E0187     | Yellowbatter                     | Test excavations                        | 709507 | 777247 | No archaeological significance                                                      |
| 18E0733     | Yellowbatter                     | Monitoring, test excavation, excavation | 709365 | 777609 | Ring-ditch and two inverted urn cremations (Bronze Age)                             |
| 20E0547     | Yellowbatter                     | Test excavation                         | 709180 | 777229 | No archaeology found                                                                |
| 18E0550ext. | Yellowbatter                     | Test excavation                         | 708877 | 777333 | Enclosure and pits                                                                  |



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| Licence No. | Townland     | Type                  | ITM E  | ITM N  | Findings                                     |
|-------------|--------------|-----------------------|--------|--------|----------------------------------------------|
| 19E04867    | Yellowbatter | Test excavation       | 709373 | 776944 | No archaeology found                         |
| 22E0121     | Yellowbatter | Test excavation       | 708247 | 777561 | Enclosures and burnt mound material          |
| 22E0340     | Yellowbatter | Test excavation       | 710111 | 775775 | No archaeology found                         |
| 18E0550     | Yellowbatter | Test excavation       | 709000 | 777393 | Pit and linear feature                       |
| 23E0175     | Yellowbatter | Test excavation       | 709200 | 777373 | Pit, full excavation 10x10m area recommended |
| 22E0503     | Yellowbatter | Monitoring            | 708115 | 777535 | Multi-period rural site including enclosures |
| N/A         | Yellowbatter | NMI Burial excavation | 709242 | 775906 | Graves of indeterminate date (SMR LH024-073) |
| 01E0489     | Beaulieu     | Test excavation       | 712439 | 777271 | No archaeology found                         |
| 12E0289     | Beaulieu     | Test excavation       | 713805 | 777760 | No archaeological significance               |



**Figure 15.8:** Archaeological excavations in the vicinity of the site (north of the Boyne River)

The Proposed Development is bounded to the south by the River Boyne, which has also attracted archaeological investigation (Table 15.2, Figure 15.9). Monitoring of material dredged from the river between 1999 and 2000 (Whitaker, Licence No.: No. 99E0535) resulted in the recovery of a large quantity of archaeological objects, including more than 3,000 pieces of worked flint, large quantities of animal bone, a human skull, medieval and post-medieval pottery, tiles, and pipes, glass, leather cut-offs, 58 small wooden objects, some possible ship timbers, an antler hammer/macehead, a worked bone toggle-like item, a copper-alloy pin and a copper alloy and basal-looped spearhead.

Monitoring of dredging in 2002 and 2006 did not record any material of an archaeological nature (Ó Faoláin, Licence No.: No. 02E1420). In 2006, monitoring of dredging activity in the Boyne also yielded considerable archaeological material (Campbell, Licence No.: No. 06E0837). This consisted of fragments from three log boats, several worked timbers (including part of a ship's rib), a complete adult female skull, and the in-situ wreck of a clinker-built vessel of possible medieval date (Wreck No. W00473).



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**Table 15.2:** Archaeological Investigations in the vicinity of the Proposed Development area

| Licence No. | Townland    | Type       | ITM E  | ITM N  | Findings                                            |
|-------------|-------------|------------|--------|--------|-----------------------------------------------------|
| 99E0535     | Stagrennan  | Monitoring | 713869 | 777740 | No archaeological significance                      |
| 02E1420     | Stagrennan  | Monitoring | 711540 | 775797 | No archaeological significance                      |
| 06E0837     | River Boyne | Monitoring | 710360 | 775545 | 3 log boats, a clicker-built vessel, worked timbers |



**Figure 15.9:** Archaeological investigations along the River Boyne in the vicinity of the site

#### 15.5.4 Topographical Files

The Topographical Files of the National Museum of Ireland were also consulted to assess the area's archaeological potential. These files list all archaeological artefacts in the care of or known to the museum. Two lead artefacts were recorded in the townland of Newtownstalaban: one button (NMI Reg. No 1989C2:7) of possibly composite sheeting with a damaged shank and initials incised on the front of the button head, while the other is a weight (NMI Reg. No. 1989C2:8) recorded as being possibly a cloth seal.

#### 15.5.5 Designated Sites

##### World Heritage Site and National Monuments

The outer buffer zone of the Brú Na Bóinne World Heritage Site is located 6.5km west of the Proposed Development. The town of Drogheda and the M1 lie in between. At this distance, with the intervening terrain and town, the Proposed Development will have no effect (direct or indirect) on the outstanding universal value of this significant site, and as such, it has been scoped out from further assessment

There are no national monuments within a 1 km radius of the site. The closest sites are within Drogheda town, such as St. Laurence's Gate and the town walls. The Proposed Development is located c.1.4km east of the town's recorded Zone of Notification (LH024-041). The Proposed Development will have no effect (direct or indirect) on the historic core of the town nor on the monuments within it and, as such, has been scoped out from further assessment.

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### Record of Monuments and Places (RMP)

There are no recorded archaeological monuments within the Proposed Development site's boundary. However, there are 10 individual archaeological sites within 1km of it (Table 15.3, Figure 15.10).

**Table 15.3:** Recorded archaeological sites in the vicinity of the Proposed Development area

| SMR/RMP No.   | Townland        | ITM E  | ITM N  | Site type                         | Distance from development to the RMP ZoN                                                                           |
|---------------|-----------------|--------|--------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------|
| LH024-074---- | Newtownstalaban | 711460 | 776763 | Enclosure                         | c. 240m north of the Proposed Development boundary                                                                 |
| LH024-074001- | Newtownstalaban | 711500 | 776770 | Field system                      |                                                                                                                    |
| LH024-094-    | Newtownstalaban | 710890 | 776290 | Concentric enclosure              | Immediately outside the northeastern boundary of the Proposed Development site                                     |
| LH024-094001- | Newtownstalaban | 710899 | 776249 | Field system                      |                                                                                                                    |
| LH025-003001- | Newtownstalaban | 711583 | 776393 | Church                            | c.16m north of the site boundary to the ZoN (the boundary of the graveyard wall is 65m north of the site boundary) |
| LH025-003002- | Newtownstalaban | 711588 | 776400 | Graveyard                         |                                                                                                                    |
| LH025-006     | Beaulieu        | 712606 | 776732 | Beaulieu Ho. House - 17th century | c. 890m west                                                                                                       |
| LH025-005001  | Beaulieu        | 712552 | 776698 | Graveslab                         | c.830m west                                                                                                        |
| LH025-005002  | Beaulieu        | 712554 | 776698 | Tomb - effigial                   | c.830m west                                                                                                        |
| ME020-006-001 | Stagreenan      | 711319 | 775312 | Church and Burial Ground          | c.583m south of the river Boyne                                                                                    |

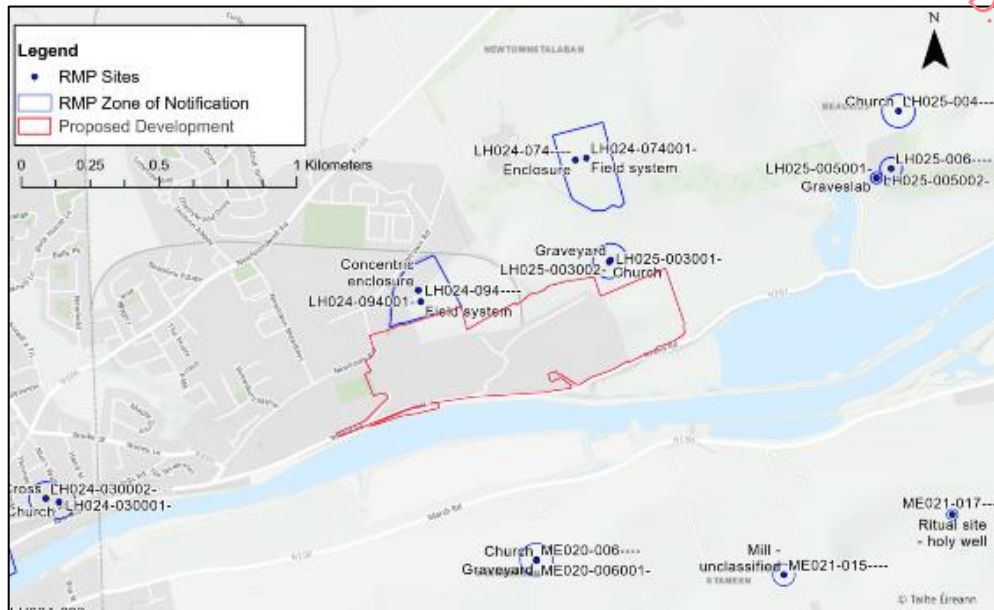


**Figure 15.10:** Site location showing archaeological heritage sites within 1km of the Proposed Development area.

Two complexes are in the lands directly adjacent to the northern boundary; these consist of an enclosure site and its associated field system (RMP No.: LH024-074, LH024-074001) and the access path to a church and graveyard (RMP No.: LH025-003001, LH025-003002) in the townland of Newtownstalaban.

The enclosure and field system (RMP No.: LH024-094) is located in the field immediately northeast of the red line boundary of the Proposed Development. The site consists of an enclosure complex that is defined by three roughly concentric features, which are likely to be fosses (Figure 15.11). The enclosure was identified during a geophysical survey (Murphy, License No.: 23R0172). The innermost enclosure measures c. 20m in diameter, the middle enclosure measures c. 45m in diameter, and the outer enclosure measures c. 80m in diameter at its greatest extent. The outer concentric feature also appears to morph into an associated field system (RMP No.: LH024-094001) characterised by field drains extending into the south. While the chronology of these features is unclear, additional lighter and straighter field drains to the east of the enclosure are considered the remains of an unmapped post-medieval system. The linear features run south into the Proposed Development area. The enclosure and the field drains were previously cut by an NNW-SSE service road to the Proposed Development site. The site has no visible surface expression.

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**Figure 15.11:** Greyscale drawing showing the concentric enclosure and field system immediately to the north of the Proposed Development area (after RMP files)

A church and graveyard (SMR/RMP No.: LH025-003/001-002) is located 65m north of the northeast corner of the Proposed Development site. It is situated at the eastern end of a ridge running east/north-east to west/southwest. The church is surrounded by a graveyard sub-rectangular in shape, measuring 25x26m, and is defined by masonry walls. The church is the parish church of a detached part of the Tullyallen parish. Only featureless portions of the east and west gables survive, measuring 10x5m in diameter; however, the lack of evidence for a doorway in the western gable suggests that the church building is in the Late Medieval era. In the graveyard, the legible headstones date from 1743-1962, although most of the burials are from the nineteenth century (Garry 1970). There is an access laneway to the church, which runs adjacent to the northern boundary of the Proposed Development. It is defined by rubble stone walls and hedgerows; the path is, however, overgrown with vegetation.

The field system (RMP No.: LH024-074) and the church and graveyard (RMP No.: LH025-003001/002) were visited in the field to establish whether the Proposed Development would have any effects (positive or negative) on the sites (see Section 15.5.7 - Field Inspection).

Given the distance from the development and the intervening landscape the remaining sites, which are described as follows will not be subject to direct or indirect impacts from the Proposed Development:

Further north, there is a second enclosure and field system site (RMP No.: LH024-074) located 240m northeast of the Proposed Development site and is on a slight southeast-facing slope. It consists of a series of two enclosures and linear features that are visible as crop marks in aerial photography. The larger outer enclosure measures c. 75m in diameter, while the smaller inner enclosure measures c. 44m. The outer enclosure is abutted by additional linear features and small field-like enclosures, also visible as crop marks in aerial photography, that probably represent field system (RMP No.: LH024-074001). There is no indication at present as to the chronology of these monuments.

In the wider vicinity of the Proposed Development site, in the neighbouring townland of Beaulieu, stands Beaulieu House (RMP No.: LH025-006; also a protected structure, see section 15.5.5.4 below). The house was built on lands originally granted to Sir Henry Tichbourne in 1642. Traditionally thought to have been built between 1660-1667, recent research suggests that the current house was likely built later, around 1715, in an old-fashioned style. The building may have been designed by Wren and may also be situated on the site of an earlier manor house that belonged to the Plunkett family.

Associated with Beaulieu House is Beaulieu Church (SMR/RMP LH025-004), which is located to the south-west of the house, with a direct visual relationship. The current building dates to 1807,

although an earlier church was founded in the area by the Plunkett family in the late thirteenth century. In the associated graveyard, two grave slabs are of particular note. A is a cross slab (SMR/RMP No.: LH025-005001) featuring a simple foliated cross carved in high relief. The grave slab is undated, and, while Garry (1980, 276) describes it as “Norman type”, Davies (1844, 276) asserts that it is like a much later creation. The second grave slab (SMR/RMP No.: LH025-005002) is a cadaver effigial monument. This is an almost life-size grave slab measuring 1.5mx0.49m and depicts a completely skeletonised effigy. The skeleton lies flat on its back with its arms and hands outstretched and resting on the folds of its garments and is covered in various types of vermin such as a snake, horned worms and speckled toads. The chronology for this grave slab is also unclear, although Roe (1969, 11) suggests a possible date in the mid-fifteenth century.

### Underwater Archaeology – The River Boyne

There is a wharf associated with the Proposed Development site on the River Boyne. There are two shipwrecks recorded in the River Boyne within 1km of the Proposed Development site (Table , Figure 15.12). Four barges (Wreck No. W00479) were visible in the sloblands of Stagreenan Polder until February 2000, three of which were broken up and reburied during dredging of the river as part of development works in Drogheda Port. Only one remained visible at the time of the update of the NMS Wrecker Viewer. The wreck of a clinker-built vessel (Wreck No. W00473) was discovered during dredging operations in 2006. It is a two-masted vessel, late-Medieval in date, with evidence of thirteen wood casks on board. The wreck was subsequently excavated by hand in 2007.

**Table 15.4:** Recorded shipwrecks on the River Boyne

| Wreck No. | ITM E    | ITM N    | Name    | Classification | Date of loss |
|-----------|----------|----------|---------|----------------|--------------|
| W00473    | 711060.4 | 775773.6 | Unknown | Clinker        | c. 1530      |
| W00479    | 711712.6 | 775702.3 | Unknown | Barge          | Unknown      |



**Figure 15.12:** Site location showing shipwrecks on the River Boyne

### Record of Protected Structures (RPS Sites)

There are no protected structures listed in the Louth County Development Plan's (2021-2027) Record of Protected Structures (RPS), nor are there sites listed in the National Inventory of Architectural Heritage (NIAH) located within the Proposed Development site.



The Louth and Meath County Development Plan (2021-2027) records 23 protected structures within 1km of the Proposed Development site (Figure 15.13). All but three of these structures are also recorded in the NIAH. There are two demesnes, Beaulieu and Newtown, and other smaller houses, however, most of these structures are located to the southwest of the Proposed Development in the eastern suburbs of Drogheda town and are linked to the industrial growth that occurred in the town in the latter half of the 18th century and into the 19th century, a period during which many fine buildings were constructed.

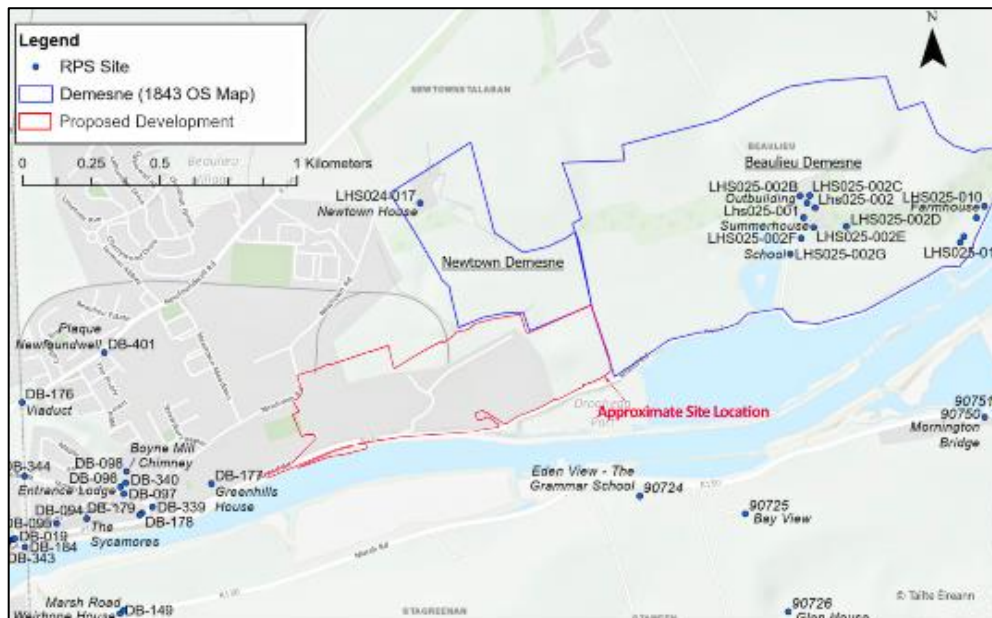


**Figure 15.13:** Site location showing the RPS site locations within 1km of the Proposed Development

To the southeast of the Proposed Development area, there are three RPS associated with the 19th-century Boyne Mill complex (RPS No.: DB-098), comprising a detached twenty-one-bay, two-storey stone building built around 1860. The former cotton mill site includes a boiler house, a mill office, a gate lodge, and a chimney. Close to the Boyne Mill complex stands Mill House (RPS No.: DB-098), an attached four-bay, two-storey house built in c.1870. It has a curved building line that follows the course of the road.

A pair of houses is also recorded on Newtown Road. The first (RPS No.: DB-178;) is a semi-detached, three-bay, three-storey house, while the second (RPS No.: DB-179;) is a slightly larger semi-detached, four-bay, three-storey house. The houses were built as a pair c. 1830. Both houses have a pitched slate roof, clay ridge tiles and brick corbelled chimney stacks and are set back slightly from the street.

The water mill on Strand Road (RPS No.: DB-339) consists of a series of attached, multiple-bay, single-storey buildings that formerly made up the Greenhills Weaving Factory linen manufacturing buildings. The buildings were constructed around 1840 and are now disused.

Greenhills House (RPS No.: DB-177) was formerly a residence of Ralph Smith, a Drogheda merchant and is also marked on Taylor and Skinner's 1777 map. The site was acquired by the Presentation Sisters in 1923 and became a convent, before the establishment of a girls' boarding school in the house in 1951. The buildings that currently exist were built in the 1960s (Garry 1977, 61), and the Presentation Sisters themselves departed the area in 2023 (McGarry 2023), although the school remains open.

Just under 1km to the west is the Great Northern Railway line (DB-176). A single stone arch road bridge over Bredin Street, it is contemporaneous with the River Boyne Viaduct. The bridge and the railway structures attest to Victorian engineering ingenuity and are valuable features within the social and historic landscape.

There are two properties to the south of the River in Meath within 1km: a former house, Eden View, now a grammar school (RPS 90724) and Bay View, a 19th-century country house (RPS 90725). Bay View has a forested area immediately north of the structure, blocking views from the house towards the site. Eden View has been developed as a school with many modern interventions and additional buildings.

**Table 15.5:** Protected Structures within 1km of the Proposed Development

| RPS No.                     | NIAH Ref.                        | NIAH Rating | ITM E  | ITM N  | Name/Site type                                                   | Distance                                |
|-----------------------------|----------------------------------|-------------|--------|--------|------------------------------------------------------------------|-----------------------------------------|
| DB-095                      | 13620011                         | Regional    | 709837 | 775581 | Boyne Cottage                                                    | c.950m west                             |
| DB-094                      | 13620010                         | Regional    | 709947 | 775599 | Greenhills Road: Sycamore House                                  | c.840m west                             |
| DB-096                      | 13620005                         | Regional    | 710070 | 775714 | Greenhills Road: gate lodge                                      | c.690m west                             |
| DB-097                      | 13620004                         | Regional    | 710082 | 775690 | Mill House, Greenhills Road: house                               | c.685m west                             |
| DB-098                      | 13620007<br>13620008<br>13620009 | Regional    | 710092 | 775772 | Boyne Mill, Greenhills Road: buildings and chimney               | c.650m west                             |
| DB-177                      | N/A                              | N/A         | 710402 | 775727 | Greenhills House, Newtown Road: convent/nunnery                  | c. 420m west                            |
| DB-178                      | 13620002                         | Regional    | 710148 | 775619 | Newtown Road: house                                              | c.685m west                             |
| DB-179                      | 13620003                         | Regional    | 710140 | 775613 | Newtown Road: house                                              | c.695m west                             |
| DB-339                      | 13620001                         | Regional    | 710186 | 775642 | Greenhills Industrial Village, Strand Road: water mill           | c.610m west                             |
| DB-340                      | 13620006                         | Regional    | 710089 | 775730 | Mill Office, Greenhills Road: office                             | c.670m west                             |
| LHS024-017                  | 13902436                         | Regional    | 711162 | 776750 | Newtown House, Newtownstalaban: house                            | c.480m north                            |
| LHS025-001 & LHS025-002 B-H | 13902509                         | National    | 712601 | 776733 | Beaulieu House and Demesne and associated structures             | c.890m west (from the main house)       |
| DB-401                      | N/a                              | N/a         | 710011 | 776205 | Plaque Newfoundwell                                              | c. 700m west                            |
| DB-176                      | 13620012                         | Regional    | 709711 | 776023 | Road Bridge                                                      | c.980m west                             |
| 90724                       | N/a                              | N/a         | 711977 | 775632 | Mornington, Eden View - The Grammar School School - Former House | c.460m south (south of the River Boyne) |
| 90725                       | 14318015                         | Regional    | 712347 | 775615 | Bay View Country House, Gates and out buildings                  | c.690m S (south of the River Boyne)     |

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### NIAH Garden Survey / Demesnes

There are two agricultural fields to the north and east of the Proposed Development that are associated with demesnes: the 19th-century Newtown House (NIAH Garden Survey Ref: 1337) and the late 16th—early 17th-century Beaulieu House (NIAH Garden Survey Ref: LH0007) (Figure 15.14).



**Figure 15.14:** Site location showing the demesne lands associated with Beaulieu House and Newtown House in blue (the extent of the demesne is as indicated from the first edition OS Map)

*Beaulieu House (SMR/RMP No.: LH025-006; NIAH Ref. 13902509, NIAH Garden Survey Ref:LH0007)*

The eastern boundary of the site is formed by the Newtownstalaban/Beaulieu townland boundary, which is also the western boundary of the demesne lands associated with Beaulieu House. The historic core of the demesne is centrally located within the demesne lands at least 890m from the eastern boundary of the Proposed Development site. As mentioned above, the house was constructed on lands granted to Sir Henry Tichbourne in 1642. The property still remains with the Tichbourne family, and it has many historical and social links. It comprises a detached two-storey country house with a dormer attic, and it incorporates the fabric of an earlier building. It was built c. 1660-1666, and the interior dates 1710 -1724. It is recorded in the NIAH survey as a building of National Importance and part of this significance is likely derived from the fact that it is the only wide-eaved, hip-roofed house of Restoration date currently surviving in Ireland. All of the exterior dressings are a type of bright red rubbed brick that is almost unknown in Ireland, and it was one of the first Irish country houses to be built without fortification.

It is set in a wooded demesne landscape with thick shelterbelts of trees defining its boundaries; it includes a decoy pond, a stable yard, and landscaped grounds. According to the NIAH garden survey, Beaulieu is a very important and unusual demesne in that it retains many 18th-century features, including the straight approach drive to the house over water and the proximity of the brick-walled garden to the house. The house is set on high ground, descending steeply to the south and across a later landscape park, with vistas to the river Boyne. Its associated outbuildings, ice houses, summer house walled gardens, gardener's house, stables, and workers' houses (to the southeast facing the river Boyne) are also protected structures (RPS Ref LH026-002/ B-H). Dense shelterbelts of trees surround the historic core surrounded by agricultural lands divided by field boundaries.

The demesne lands are subdivided by a north-south-orientated public road aligned with mature trees. To the east of the public road, there is a very thick shelter belt of trees within which are decorative ponds along a watercourse that runs roughly east-west through this landscape.

There are no meaningful or designed views from the historic core in Beaulieu westward in the direction of the Proposed Development area. The tree-lined public road and a substantial shelter belt of trees effectively screen the view from the core of the demesne towards the Proposed Development lands. From the southwestern agricultural field within the demesne lands, the eastern end of the Proposed Development is dominant in the westerly view, where there is a considerably high stockpile of material.

*Newtown House (RPS No.: LHS024-017; NIAH Ref.: 13902436 NIAH garden survey 1337)*

Newtown House built c. 1830, is located c. 480m north of the Proposed Development area. It comprises a detached seven-bay, two-storey house with a rectangular plan. A house is marked on the current site in Taylor and Skinner's Map of Louth in 1777, depicting an older structure that predates the current house. There is a parkland to the south of the house and a dense shelterbelt of mature trees, which have been developed over time. The house and associated outbuildings and walled garden are surrounded by a dense shelterbelt of trees to the south, restricting views from the historic core towards the landscape to the south.

Outside of the core, the demesne comprises open agriculture fields with mature field hedgerow field boundaries. The eastern end of the Proposed Development site can be seen from the southernmost agricultural field associated with the demesne, where the large active stockpile blocks any southerly views to the River Boyne. There was a tree-lined access track to 'Teach Lobin' Church from the house, the path for which has been lost over time.

#### 15.5.6 Townlands and Place Name Analysis

Townland and topographic names are an invaluable source of information on topography, land ownership and land use within the landscape. They also provide information on the history, archaeological monuments, and folklore of an area. A place name may refer to a long-forgotten site and may indicate the possibility that the remains of certain sites may still survive below the ground surface. The Ordnance Survey surveyors wrote down townland names in the 1830s and 1840s, when the entire country was mapped for the first time. Some of the townland names in the study area are of Irish origin and, through time, have been anglicised. The main references used for the place name analysis are Irish Local Names Explained by P.W Joyce (1870) and [www.logainm.ie](http://www.logainm.ie).

The Proposed Development is in the townland of Newtownstalaban; it is surrounded by Beaulieu and Beltichburne on the east, Cannonstown and Townrath on the north, Lagavooreen, Commons, Greenbatter and Yellowbatter to the west with the River Boyne to the south. On the opposite side of the river in County Meath is Stagrennan and Stameen. The Irish for Drogheda is *Droichead Átha*, which means "the bridge at the ford". This was the name given to the lowest bridging point of the Boyne River.

A description and a possible explanation of each townland name in the environs of the Proposed Development area are provided in Table 15.6. Almost all of the townland names in the study area are anglicised versions of a name of Irish origin; the names are mentioned in sources dating to at least the late medieval period.

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**Table 15.6:** Place Name Analysis for townlands surrounding the Proposed Development area

| Townland        | Parish             | Barony       | Origin | Irish name and meaning/origin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------|--------------------|--------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Louth</b>    |                    |              |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Beaulieu        | Beaulieu           | Ferrard      | Irish  | A derivation of the Irish <i>Béilinn</i> , it has been recorded in various forms since at least 1301.                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Lagavooren      | St Mary's          | Duleek Lower | Irish  | An anglicisation of the Irish ' <i>Log an Mhúirín</i> ', meaning a hallow or a muddy place                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Newtownstalaban | Beaulieu           | Ferrard      | Irish  | Its Irish form is <i>Baile Nua Steach Liobáin</i> . It has been recorded in various forms since 1235 as ' <i>Tigh Liobáin</i> ', meaning Liban's House. The OS name books record that the Irish-speaking people in the locality called the townland ' <i>Baile nua an manach</i> ', ' <i>Baile nuadh an droicheit</i> ' i.e. Newtown Grange or Newtown Drogheda. In 1203 there is a reference to a grant to the Church of St Marys in Drogheda of granges and lands in ' <i>Ybhar Tigi Liban</i> ', possibly <i>Tigh Liobáin</i> |
| Yellowbatter    | Drogheda St Peters | Ferrard      | Irish  | An anglicisation of <i>Bóthar Buí</i> , from the Irish words <i>bóthar</i> - "road" and <i>buí</i> "yellow"                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Meath</b>    |                    |              |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Stagreennan     | Colp               | Duleek Lower | Irish  | The anglicisation of the words ' <i>Sta Grianan</i> ' meaning summerhouse/palace or perhaps Grennans house. The element ' <i>Sta</i> ' is the Danish form of <i>teach</i> or house.                                                                                                                                                                                                                                                                                                                                              |
| Stameen         | Colp               | Duleek Lower | Irish  | From the Irish <i>Steach Mín</i> , meaning smooth house, it may refer to a landowner named Stamene, recorded in 1366.                                                                                                                                                                                                                                                                                                                                                                                                            |

### 15.5.7 Field Inspection

#### Introduction

A field inspection was carried out on a clear, bright day on the 6<sup>th</sup> of March 2024. The purpose of the field inspection was to assess the site, its previous and current land use, topography, and any additional information relevant to the report.

A member of the plant's staff facilitated full accompanied access to the site for the survey. The Proposed Development site and its immediate environs were inspected, and no difficulties were encountered.

The Proposed Development is within the Premier Periclase site; it is situated on a natural east-west ridge on the northern banks of the river Boyne above the Strand Road (R167). It comprises an area of 35.6ha, with the eastern third functioning as a landfill/stockpile area. The primary access to the site is from an entrance road to the southeast on Strand Road (R167). A second access to the existing site is currently available to the north through agricultural fields from Newtown Road



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(Figure 15.15). There are three other used and unused vehicular access points into the development.

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**Figure 15.15:** Site location and location of features described in the text

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### ***The western end of the site***

The western side of the site includes the main entrance, the administration buildings and car parking. The structures on the site are all mid-20th-century or later in date and are generally functional; the main office block is a two-story building with 11 bays, uPVC windows, and a flat roof. Other buildings comprise single-storey sheds with corrugated tile half-pitched or flat roofs with replacement uPCV windows (Plate 15.1). These structures do not have a built or cultural heritage merit.



**Plate 15.1:** View looking northwest of the administrative area of the site

On the northern side of the site, there is a large oil tank surrounded by an earthen berm. In the field to the north, outside of the Proposed Development area, there is a curving rail siding that once provided access to the tank. The rail line is now densely overgrown by vegetation and is inaccessible (Figure 15.6). One exposed section of the rail line can be seen on the northern boundary of this field at a field entrance (Plate 15.2).



**Plate 15.2:** Remnants of the rail line at a field entrance outside of the Proposed Development boundary to the north



There is a mechanical workshop in the northwestern area of the site (CH1, Figure 15.15); it is a later addition to the other structures in this part of the site. It comprises a detached, rectilinear double-height, single-storey, 2-bay concrete rendered structure with a single-storey section to the north (Plates 15.3-15.5). The main building has a unique undulating concrete roof that appears wave-like from the exterior. Five panels of steel-framed glazing on the southern elevation allow light to flood the structure without glare. Two roll door shutters provide machine access. On the front (eastern) façade, there are concrete pilasters with a parapet rising above the roof structure and a rendered chimney sack, a single metal door for entry and two roll-door shutters for machine access, with narrow concrete canopies overhead. On the northern side of the building, there is a flat-roofed extension at a lower height than the main structure, with a chimney and series of small square opes running just below the roof level. A small metal lean-to is attached to the north side of the structure.



**Plate 15.3:** View northwest of the side elevation and front façade of the workshop (CH1)



**Plate 15.4:** Side (southern) elevation of the workshop



**Plate 15.5:** View to the southeast of the front façade and side elevation (northern) of the workshop

Inside the building, concrete pillars and corbels along the walls support an integrated gantry crane. The undulating roof structure is exposed and painted blue, enhancing the curves (Plate 15.6).

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**Plate 15.6:** Interior of the workshop showing roof detail and internal gantry crane

The workshop building is a well-designed and unique late-twentieth-century industrial structure. It exemplifies functional design with clarity of form and detail and well-considered use of glazing, steel, and concrete. Its design contrasts with the more commonplace administration buildings and workshops within the western end of the site.

This undesignated structure is considered to be of industrial and technical interest (CH1). It is proposed that this structure be retained in the development.

### **Stockpiles/Landfill Areas**

Almost all of the site comprises made-ground. There are grass/vegetation-covered areas on the site, (Figure 15.15, Plate 15.7 to Plate 15.9). These are former stockpile areas, which have been 'capped' or planted landscaped with grass or are areas overgrown with reseeded vegetation..

The built-up nature of the Proposed Development site is evident from the significant drop in ground level in the agricultural lands situated outside of the Proposed Development site to the north, where the ground level is at least 5m+ lower than that of the site. It is within these agricultural lands that the recorded enclosure site and associated field system discussed in section 15.5.5.2 were identified (RMP LH024-094).



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**Plate 15.7:** View from the stockpile, looking north to the secondary entrance to the site. Note the difference in elevation of the landscaped to the fields to the north



**Plate 15.8:** View towards the northeast of the stockpile in the northern central area of the site



**Plate 15.9:** View west from limestone fines area 1 to the northeast of the site

### **Central Area**

The main production facility is centrally located on the site. Most former mid-20th-century cement factory buildings have been decommissioned and were at the time of the field inspection unused or only partially used for current magnesia or magnesium hydroxide production. The former concrete factory includes large-scale concrete and steel structures, including banks of storage silos, interconnected systems of platforms, gantries, conveyor belts, chutes, cranes, kilns, mill houses, workshops, slurry and water pipes (Plates 15.10-15.11). Underground areas below these structures have been deliberately blocked with rubble.

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**Plate 15.10:** View west towards the rear second bank of silos from the centre of the production facility area and rotary kiln building on the left-hand side.



**Plate 15.11:** View east from inside the original cement factory

At the eastern end of the production facility, at the entrance into the site, it is proposed to retain three of the existing storage silos and three bays of the pitched roof crane store shed and incorporate it into the energy campus design (Plates 15.12-15.14).

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**Plate 15.12:** View looking east of the crane store (CH3), silos (CH2) and, rotary kiln building at the western end of the site (Stitched image). The highlighted structures will be retained/partially retained in the Proposed Development



**Plate 15.13:** View towards the southwest of the crane store structure



**Plate 15.14:** Interior of the crane store structure (showing detail of the integrated gantry). This end of the structure is to be retained

The more recent structures associated with the magnesia and magnesium hydroxide production facility, which dates to the 1970s, are located east and south of the original concrete factory. The structures include shaft kilns, a briquetting plant, chimneys, settling and thickening tanks, storage sheds, and kilns for manufacturing magnesia-based products (Plates 15.15-15.8).



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**Plate 15.15:** View looking east within the area of the magnesia and magnesium hydroxide facility



**Plate 15.16:** View looking west within the area of the magnesia and magnesium hydroxide facility



**Plate 15.17:** View looking east of the magnesia and magnesium hydroxide facility and shaft kiln brick shed on the left-hand side



**Plate 15.18:** View looking south of the buildings on the site from Stockpile 1.

In this area, a short stretch of poorly preserved steel railway track emerges through the concrete surface, it is cut by a steel drain (Plate 15.19). As shown on the latest OS Map (Figure 15.12), the extensive track system that ran through the site has been removed or covered by the concrete

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surface. Further remnants of the track may lie beneath the concrete surface in the central area of the site. The greatest surviving section are in the fields to the north of the site as described above.



**Plate 15.19:** Remnant of the train track within the site cut by a drain

Modern research buildings and lime kiln and pet coke storage silos are on the site's southern side. A concrete rail platform is located alongside where the railway lines once ran, the line of the railway is now a concrete surface. There is a covered conveyor belt that runs across the Strand Road to the loading wharf/pier to the river Boyne (Plate 15.20-15.22).



**Plate 15.20:** View of the South side of Limekiln, Pet coke storage silos and export gantry, the former concrete rail platform lies in the middle ground of the photograph



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**Plate 15.21:** View towards the loading wharf/pier



**Plate 15.22:** Detail of the concrete railway platform

***The eastern end of the site***

The eastern third of the site comprises large concrete settlement ponds and access roads (Plate 15.23). At the easternmost end, there is a large stockpile mound (c. 62 sqm) of predominantly lime magnesia that rises to at least 16m+ and dominates the views from the fields to the north of the site (Plate 15.24).

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**Plate 15.23:** Settlement ponds and, in the background, the large stockpile area



**Plate 15.24:** View south from outside of the Proposed Development area of the large active stockpile area

The Newtownstalaban/ Beaulieu townland boundary forms the site's eastern boundary. It comprises a mature hedgerow, and the active landfill area runs right up to it.

#### ***Recorded Archaeological Sites in Proximity to the Proposed Development***

There are two recorded monuments immediately outside the Proposed Development to the north. A church and graveyard site and an enclosure site and field system.

##### ***Church and graveyard (SMR/RMP No.: LH025-003/001-002)***

The church and graveyard site are located c.65m north of the northeast corner of the Proposed Development site. The church is accessed via a laneway defined on both sides by a rubble stone wall. It is densely overgrown with vegetation, making it difficult to get through; this lane was formerly referred to as Gypsies Lane and 'Church Lane' by the locals. The northern boundary of the central area of the Proposed Development site, which is comprised of planted trees and hedgerows, is contiguous with this lane. The church, located at the eastern end of the lane, is enclosed by a subcircular rubble stone wall; there is a gate and a style and the end of the lane, and

steps through the enclosing wall to the graveyard. The site is on a hillock and is very overgrown. Only the ruined gable end of the church survives, and there are a number of gravestones dating from the eighteenth and nineteenth centuries. From within the graveyard, the large easternmost stockpile within the Proposed Development area can be seen through the trees, which prevents any views to the south. Before the cement factory, there would have been open views towards the river Boyne from this site (Plate 15.25).



**Plate 15.25:** View from the graveyard looking south. The stockpile is dominant in the view to the south towards the river Boyne

*Enclosure and field system site (RMP No.: LH024-094)*

The enclosure site is within a level field of pasture; it is bound by the curving former cement factory railway sidings to the north and west, which present as overgrown field boundaries, and by secondary access into the Proposed Development area to the east. The field is featureless and is generally level with only subtle undulations. There are no above-ground indications of the subsurface enclosure site or the field system. The subject site is immediately south of this field; there is a c.5m+ height difference between it and the field.



**Plate 15.26:** View southwest across the site of RMP No.: LH024-094



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### Field Inspection Conclusions

Four features of cultural/industrial heritage merit were identified within the site (Figure 15.15):

**Table 15.7:** Undesignated Cultural Heritage Features within the site and their significance (EPA 2022) (see Appendix E: Significance criteria)

| Ref: | Feature                                    | Name/Site type                                                                                                                                                                                                   | Significance |
|------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| CH1  | Mechanical workshop                        | A unique late-twentieth-century industrial structure with an undulating concrete roof. Its design contrasts with the more commonplace administration buildings and workshops within the western end of the site. | Low          |
| CH2  | Cement factory silos                       | Visually dominant structures associated with the original cement factory                                                                                                                                         | Low          |
| CH3  | Pitched roof crane store shed              | Visually dominant structures associated with the original cement factory                                                                                                                                         | Low          |
| CH4  | Newtownstalaban/Beaulieu townland boundary | Historic land division                                                                                                                                                                                           | Low          |
| CH5  | Disturbed rail sidings                     | A short stretch of surviving but disturbed rail siding within the Proposed Development                                                                                                                           | Low          |
| CH   | Former rail platform                       | A simple concrete rail platform with steps and a ramp.                                                                                                                                                           | Low          |

### 15.5.8 Site Levels

The predominant ground composition within the site is made-ground/fill material, as confirmed by the field inspection. This is demonstrated in conceptual models of cross-sections throughout the site (Figures 15.16-15.19), which show a roughly east-west section across the southernmost part of the site (B-B'), a northwest-southeast (A-A') section across the site and a northwest-southeast section across the eastern end of the site (C-C') (the yellow layer is indicated as fill material). The models are based on previous site investigation work and show the substantial fill material across the site.



**Figure 15.16:** Location of the two cross sections, A-A' and B-B' of the site (after OCM, 2016)

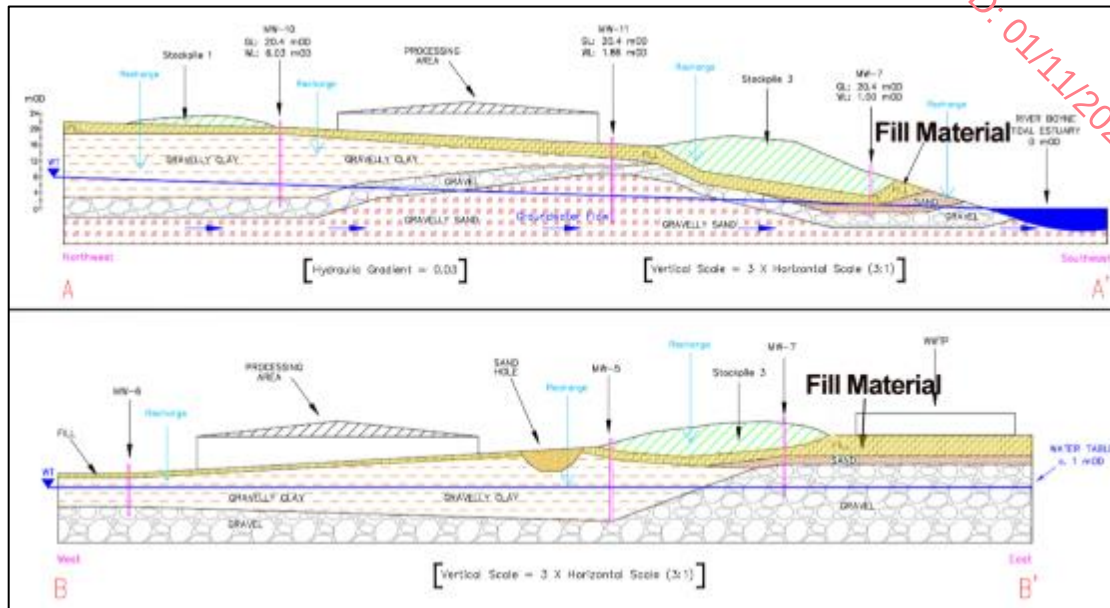


**Figure 15.17:** Modelled cross-section of the site showing the layer of fill across the site (indicated in yellow) overlying the natural geology, cross section A-A' and section B-B' (after OCM, 2016).



**Figure 15.18:** Location of cross section C-C' across the eastern end of the site (after OCM, 2016)

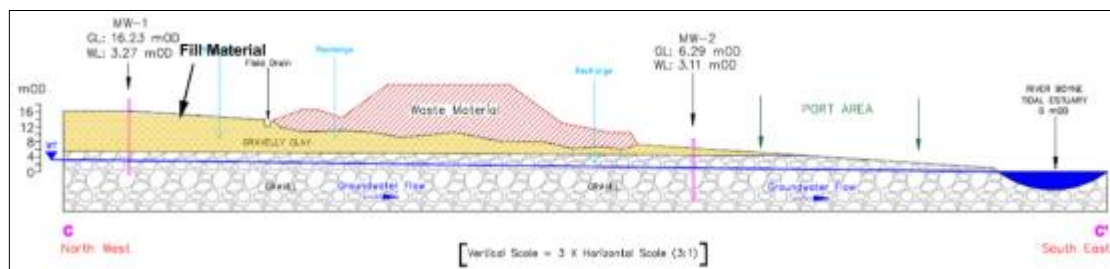


**Figure 15.19:** Modelled cross-section of the site showing the layer of fill across the site (indicated in yellow) overlying the natural geology, cross section C-C' (after OCM, 2016).



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## 15.6 Baseline Study Summary/Conclusions

The baseline study has led to the following conclusions in relation to the likely and potential effects of the Proposed Development on the cultural heritage environment:

### *Archaeological Heritage -Designated Sites*

There are no recorded archaeological sites within the Proposed Development area. No previously unidentified sites of archaeological potential were identified as a result of this assessment within the Proposed Development area.

Two archaeological complexes are in agricultural land directly outside of the Proposed Development boundary to the north: an enclosure site and its associated field system (RMP No.: LH024-074) and a church and graveyard and access path to it (RMP No.: LH025-003001-002) in the townland of Newtownstalaban (Figure 15.10). The Proposed Development will not directly affect these sites; however, there are indirect positive effects relating to the reinstatement/landscaping of the lands within the Proposed Development area.

### *Archaeological Potential*

The Proposed Development is on the banks of the River Boyne which would have attracted settlement activity since the prehistoric period. It is in a highly sensitive archaeological landscape as testified by the number of recorded archaeological sites in its vicinity and new archaeological discoveries of previously unknown archaeological sites in advance of developments in greenfield areas. The site is however a fully developed brownfield site and is predominantly made-ground, and as such, this archaeological potential is deemed to be negligible.

### *Architectural Heritage*

There are no designated architectural heritage sites (RPS, NIAH) within the Proposed Development boundary. No designated architectural heritage sites will be affected by the Proposed Development, either directly or indirectly (Figure 15.13).

The Proposed Development shares its northern and eastern boundary with agricultural lands in the outer demesne lands associated with Newtown House (NIAH Garden Survey Ref: 1337) and Beaulieu House (NIAH Garden Survey Ref: LH0007), which comprise agricultural fields bound by hedgerows. The site's eastern boundary is also Newtownstalaban/ Beaulieu townland boundary. There will be no direct impact on the demesne lands; however, the Proposed Development will have an indirect positive effect on the demesne lands and the surrounding landscape relating to the reinstatement /landscaping of the lands within the Proposed Development.

### *Industrial/Cultural Heritage*

Field inspection and desk-based assessment have established that the cement factory (opened in 1938) played a pivotal role in developing the new Irish state and was closely linked to improvements in housing, transport, and infrastructure. It was also a significant direct and indirect employer for Drogheda. It had a dominant visual presence at the eastern outskirts of the town on the banks of the river Boyne and during its peak, it had an overhead aerial ropeway with moving buckets traversing the northern landscape of Drogheda from a quarry in Mell, its own rail sidings, and a pier on the river. These features are all documented in the 1946 OS Map. In 1977, it was adapted into a Magnesia and Magnesium Hydroxide Facility.

All the structures within the site are mid-20th-century and later (Field Inspection, 15.5.7). The concrete and steel buildings and associated towers, gantries, settlement ponds, etc., were purpose-built and functional; they developed haphazardly, infilling the site to adapt to economic change as necessary and have little heritage value. The former cement factory, however, is of social and historical value to the town of Drogheda and played an essential role in the development of the State. As such, as a designed-in mitigation measure, it is proposed to retain at the entrance into the site three storage silos (CH2) and three bays of the pitched roof crane store shed (CH3) associated with the original cement factory. These structures are representative of the scale and density of the industrial structures on the site and are visually dominant at the entrance to the facility. The retention of these features is positive as they connect to the past and will be a testament to the new State's economic needs and Drogheda's industrial importance. The structures

will be incorporated into a high-quality design, forming part of a new chapter in the site's development.

There is one structure in the northeastern corner of the site considered to be of industrial and technical heritage merit: an undesignated late 20th-century workshop (CH1, Plate 15.3-15.6). This structure shall be retained as a workshop within the Proposed Development as a designed-in mitigation measure.

## 15.7 Characteristics of the Proposed Development

The Proposed Development to which this planning application relates is the first phase of CORE, and will consist of extensive works that will transform the ca. 35.6 hectare site and set it on a path that will result in it becoming a sustainably powered enterprise campus. It is noted that the Proposed Development is unrelated to the existing Industrial Emissions licensed activity at the site.

The Proposed Development consists of the following (See *Chapter 2 Description of Proposed Development*, Figure 15.20):

- The demolition of existing processing and industrial buildings, ancillary structures, and services associated with the Premier Periclase Ltd. (PPL) facility, site clearance and remediation works. The Proposed Development will carefully sequester the licensed (inert) landfill onsite in accordance with all ongoing and future requirements of the EPA.
- A number of existing buildings and structures will be maintained as part of the Proposed Development, such as an existing Workshop Building (located within the northwest of the site), part of an existing Crane Store structure, 3 no. Lime Silos and existing water tanks and infrastructure. These will be incorporated into the design where beneficial and appropriate.
- The construction of a three storey Energy Centre (EC) building in the northwestern area of the subject site to accommodate 9 no. gas engines, electrical rooms, mechanical plant rooms, telecommunication rooms, switchrooms, and uninterruptible power supply (UPS) rooms. The building includes 9 no. flues ca. 28.9 metres in height. Solar PV arrays and plant will be provided at roof level.
- The construction of a three storey Data Centre (DC) building within the southern portion of the site to accommodate data hall floorspace, mechanical and electrical rooms, support facilities, telecommunication rooms, storage, and ancillary office / administration space. Solar PV arrays and plant will be provided at roof level, with a structure offset from the southern façade of the building providing additional solar PV arrays and a green wall.
- The construction of a single storey Facility Operations Centre (FOC) building to the west of the EC building, to accommodate security and network operations centre rooms, staff facilities, plant rooms, and storage.
- The construction of a single storey Pump and Filtration Building in the northeastern portion of the site.
- The construction of ancillary structures including a single storey Security Gatehouse and Security Kiosk at the main site entrance from Boyne Avenue.
- An ESB Substation will be provided in the northwestern corner of the site within a fenced compound, to accommodate transformers, electrical equipment and a single storey ESB Control Building. It is noted that the cable connection from this substation to an offsite ESB substation to the north, which is in partial ownership of PPL, is not included as part of the Proposed Development and will be subject to the necessary consenting process by ESB, separate to the Proposed Development.
- A Battery Energy Storage System (BESS) compound will be provided to the north of the proposed EC building, accommodating battery units and associated plant and equipment within a fenced compound.
- The construction of a Cooling Compound substation located to the immediate east of the BESS compound.

- A Thermal Store Compound to accommodate thermal storage equipment will be located to the east of the EC building.
- The provision of a Pump and Filtration System and other ancillary structures including a Firewater Tank, a Fire Fighting Water Pump Building, a Control Building, a Maintenance Yard, and Waste Management facilities.
- The provision of ground-mounted solar PV arrays on the existing licensed landfill and stockpile no. 3 (which will be re-profiled and capped), along with 3 no. compact substations.
- Staff car parking (50 no. spaces) and bicycle parking will be provided in the western portion of the site, adjacent to the proposed FOC Building and DC Building.
- All associated works including access arrangements, internal roadways and footpaths, car and cycle parking, boundary treatments, landscaping and services, and all ancillary works.

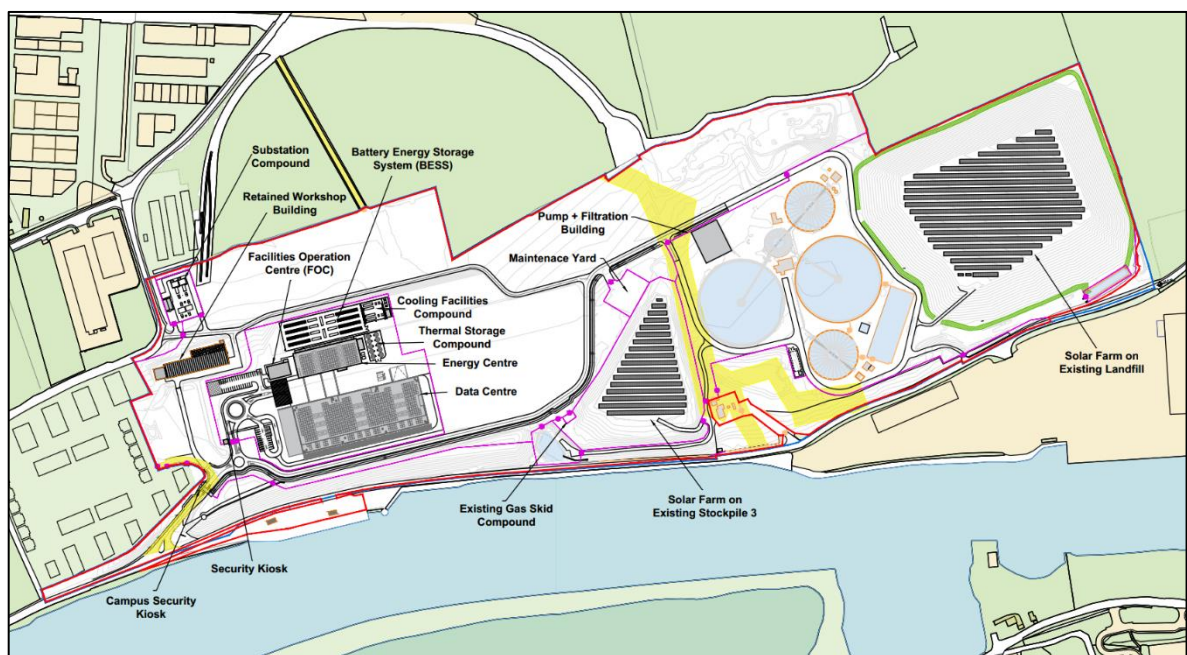


**Figure 15.20:** Proposed Development layout

## 15.8 Potential Effects

### 15.8.1 Significance of Effects

Archaeological and cultural heritage sites are considered non-renewable resources, and cultural heritage material assets are generally considered to be location-sensitive. In this context, any change to their environment, such as construction activity and ground disturbance works, could adversely affect these sites. The likely significance of all effects is determined by considering the magnitude of the impact and the baseline rating upon which the impact has an effect (i.e., the sensitivity or value of the cultural heritage asset). Having assessed the potential magnitude of impact with respect to the sensitivity/value of the asset, the overall significance of the effect is then classified as imperceptible, not significant, slight, moderate, significant, very significant, or profound as per the EPA guidance (2002).

A glossary of effects and assessment terms, including the criteria for the assessment of the significance of the effect, is contained in Appendix E of this EIAR.

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## 15.8.2 Demolition and Construction Phase

### Effect on Recorded Archaeological Monuments (RMP sites)

#### *Direct effects*

There are no designated archaeological sites (RMP sites, national monuments) within the Proposed Development area. The demolition and construction phase of the Proposed Development will have no direct negative effects on designated archaeological sites.

#### *Indirect effects*

The ruins of a Late Medieval church, Teach Liobáin (RMP No.: LH025-003001), and graveyard (RMP No.: LH025-003002) are located in agricultural land c.65m north outside of the northeast corner of the Proposed Development boundary. An access laneway to the church is contiguous with part of the northern boundary of the Proposed Development site. No construction or demolition works are proposed in the vicinity of the church and graveyard site, and as such, the Proposed Development will have no direct effects on the site.

From the church and graveyard site, however, there is a view of the easternmost stockpile (15+m high) associated with the development site; this blocks any views from the church site to the south towards the River Boyne. The presence of the stockpile contributes negatively to the existing setting and experience of the church and graveyard (even given the overgrown nature of the site). The church and graveyard site are recorded archaeological monuments and, as such, are of medium significance/sensitivity. The proposed remediation and landscaping in the area of the easternmost stockpile will have a positive, indirect effect of a low magnitude on the site as it will enhance the southerly views from the church and graveyard. The overall effect on Teach Liobáin (RMP No.: LH025-003001/002) is a positive effect of slight significance.

### General Archaeological Potential

The presence of a subsurface enclosure and field system (RMP No. LH024-094), church and graveyard site (RMP No.: LH025-003001/002) located north outside the development and the river Boyne to the south suggests there is a general archaeological potential within the Proposed Development area.

Previous disturbance within the Proposed Development site however has significantly negated the potential for the discovery of previously unknown subsurface archaeological deposits, features, or finds within the site. The effects of the Proposed Development on unknown archaeological sites or features within the Proposed Development is negligible and the overall effect is imperceptible.

### Effect on Underwater Archaeology

A seawater reservoir in Baltray and a freshwater reservoir in Mell Quarry are associated with the existing production facility. No works associated with the Proposed Development will occur outside of the site in the sea or the river Boyne or for the existing connections to the Proposed Development site. Water extraction will, however, continue at both sites (likely at different rates than currently licenced).

The construction and demolition phases of the Proposed Development will have no direct or indirect effect on underwater archaeological heritage.

### Effect on Built and Cultural Heritage

#### *Direct Effects*

No designated architectural heritage sites (RPS, NIAH) are within the Proposed Development boundary. The Louth and Meath County Development Plan records 23 protected structures within 1km of the Proposed Development site. The Proposed Development will not negatively affect the structures in the surrounding landscape due to their location, nature, modern settings, screening, or distance.

The western boundary of the site is formed by the Newtownstalaban/ Beaulieu townland boundary (CH4). The Proposed Development will not have an effect on this boundary. It will remain as is to the east of the site. The Proposed Development will have a neutral effect on this boundary.



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### *Indirect Effects*

Two agricultural fields north and east of the Proposed Development form the outer farmland associated with the Newtown House (NIAH Garden Survey Ref: 1337) and Beaulieu House (NIAH Garden Survey Ref: LH0007) demesnes. The proposed remediation and landscaping works of the easternmost active landfill stockpile will improve or 'naturalise' the views from the outer fields associated with the demesnes. The demesnes, whilst undesignated, are of medium significance given their association with protected structures. The effect of remediation works will have a low positive effect, which will result in the enhancement of the character and/or setting of the outer agricultural lands associated with the demesnes. The Proposed Development will, therefore, have an overall positive effect on the surrounding built environment of slight significance.

### **Effect on Industrial Heritage**

The former cement factory is of local cultural heritage merit. As a designed-in mitigation measure, it is proposed to retain at the entrance into the site three storage silos (CH2) and three bays of a pitched roof crane structure (CH3). They are representative of the scale and density of the industrial structures on the site and are visually dominant at the entrance to the facility. The retention of these features is positive as they connect to the past and will be a testament to the new State's economic needs and Drogheda's industrial importance. The structures will be incorporated into a high-quality design, forming part of a new chapter in the site's development. The retention of these undesignated structures of low significance within the Proposed Development will have a positive medium effect of slight significance.

In the northeastern corner of the Proposed Development, there is an undesignated late 20th-century workshop (CH1) considered to be of industrial/technical heritage merit. It is distinctive amongst the other more commonplace administration and industrial buildings within the site. It has a unique undulating concrete roof seen from the exterior and interior. It was purpose-built to house a gantry. The structure exemplifies functional design with well-considered use of glazing, steel, and concrete. This structure shall be retained as a workshop within the Proposed Development as a designed-in mitigation measure. The retention of this undesignated structure of low significance will have a medium effect, giving rise to an overall positive effect of slight significance.

Only a very short and poorly surviving section of the former cement factory internal railway exists within the Proposed Development area (CH5). This section is not in a condition that would support or justify its in-situ retention within the Proposed Development. This is in contrast to the railway sidings in the greenfield areas to the north and outside the bounds of the Proposed Development area, which remain intact and in excellent condition. Similarly, the concrete railway platform (CH6) would not benefit retention within the Proposed Development. Without its associated railway line, it is an isolated structure with limited heritage value. The removal of these features would allow for more efficient land use within the Proposed Development area. The removal of these undesignated features of low cultural heritage sensitivity will have an effect of medium magnitude, resulting in an overall impact of slight significance.

### **15.8.3 Operational Phase Effect**

All physical archaeological, architectural and cultural heritage impact issues will be resolved at the pre-construction stage of the development, and therefore, no potential effects are envisioned at the operation stage of the development. The operational effects will be of no significance.

## **15.9 Mitigation Measures**

### **15.9.1 Demolition Phase Industrial Heritage**

The facility is an important local cultural heritage site, and as such, the workshop (CH1), three silos (CH2) and three bays of a large steel-framed crane store shed (CH3), substantial structures within the site, will be retained and incorporated into the development to reflect the use of the site in the past. A comprehensive photographic and written record of all the structures across the site will be carried out to record the site's industrial origins prior to their demolition to form a record of the past.



An interpretation area that includes signs and digital media linkages, such as QR codes, will provide a comprehensive history and backdrop of the site's industrial heritage development. This will enable visitors to understand and appreciate the cultural significance of the site and the value of the retained structures. The panels will include illustrations and text designed to be informative and readily accessible to the general public, fostering an interest and pride in the heritage of the area.

In order to commemorate the railway that once ran through the site, it is proposed to construct a viewing platform in the southwestern most part of the site. This platform will not only offer a vantage point overlooking the historic Millmount and the Viaduct within the town; it will also preserve and display any fragmentary remains associated with the railway line that is recovered within the site (see *Chapter 5 Landscape and Visual*). Information panels in this location will detail the railway's significance, characteristics and role in the early operation of the cement factory, early photographs and maps of the railway will support this interpretation.

Prior to demolition, it is recommended that a robust cordon be placed inside the northern and eastern boundary of the site. This will safeguard the access path outside the boundary that leads to the church and graveyard site (RMP No.: LH0025-004) and the Newtownstalaban/Beaulieu townland boundary. The site contractors must be made aware of the heritage value of the boundaries.

### **15.9.2 Construction Phase Archaeological Heritage**

Given the site's built-up and heavily disturbed brownfield nature, archaeological finds or features are unlikely to be identified during earthmoving works associated with the construction phase. Full-time archaeological monitoring of the earthmoving works is not considered necessary at the site. An archaeologist will be retained as part of the construction team. Their responsibility will be to assist and provide guidance on a strategy to recover any railway or other industrial objects found on the site during site clearance and demolition works in collaboration with the contractor. The archaeologist will assess these items to determine their suitability for exhibition in the viewing platform display area. Additionally, they will assist in the interpretation of the site for the signage panels.

#### **Built and Cultural Heritage**

As no adverse impacts were identified, no mitigation measures are required.

### **15.9.3 Operational Phase**

No mitigation measures are required during the operational phase of the development. All physical archaeological, architectural and cultural heritage issues will be resolved at the pre-construction stage of the development, and therefore, no potential effects, are envisioned at the operation stage of the development.

## **15.10 Residual Effects**

### **15.10.1 Construction Phase**

There are no residual effects during the construction phase. Once the mitigation measures are implemented in full, previously unknown subsurface archaeological features that are identified will be resolved and recorded in full.

### **15.10.2 Operation Phase**

Upon the completion of the Proposed Development, there will be no negative residual effects on the archaeological or cultural heritage resource. The current site is a dominant industrial site within the town of Drogheda and on the banks of the river. The proposed landscaping and rehabilitation of the visually dominant mounds of spoil and structures on the site will improve the existing scenario.

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#### 15.11 Monitoring Requirements

No future monitoring of cultural heritage to test the predictions made within the impact assessment is considered necessary.

#### 15.12 Cumulative effects

No cumulative impacts were identified in the course of this assessment.

#### 15.13 Interactions

No interactions were identified during the assessment process.

#### 15.14 Difficulties Encountered

No difficulties were encountered during the compilation of this chapter.

#### 15.15 Chapter Bibliography

Bradley, J., 1978, 'The topography and layout of medieval Drogheda', J Co Louth Archaeol Hist Soc, 19, 98-127

Bradley, J. (1984) Urban Archaeology Survey; Co. Louth, OPW Dublin.

Bradley, J. (1995) Walled Towns in Ireland, Dublin.

Bradley, J. (1997) Drogheda: Its Topography and Medieval Layout, Old Drogheda Society.

Breen, T., 2000 Mell 2. In I. Bennett, I (ed) Summary accounts of archaeological investigations in Ireland. Dublin

Bolger, T., 2000 Northern Motorway, Contract 7, Site 10, Rathmullan. In I. Bennett, I (ed) Summary accounts of archaeological investigations in Ireland. Dublin

Buckley, V. M., & Sweetman, P. D. (1991) Archaeological Survey of County Louth, the Stationery Office, Dublin.

Campbell, K. 2000 Mell 6. In I. Bennett, I (ed) Summary accounts of archaeological investigations in Ireland. Dublin

Campbell, K. 2000 Oldbridge 1. In I. Bennett, I (ed) Summary accounts of archaeological investigations in Ireland. Dublin

Conway M., 2002, 'Caffrey's monumental works, Dyer Street, Drogheda, Co. Louth,' in Bennett, I. (ed.), Excavations 2000. Bray: Wordwell Ltd.

Coughlan, T., 2001, 'Shop Street/Dyer Street, Drogheda, Co. Louth', in Bennett, I. (ed.), Excavations 1999. Bray: Wordwell Ltd.

Carroll, F. and Murphy, D., 1987 A second souterrain at Termonfeckin. In the County Louth Archaeological and Historical Journal Vol XXI No.3

Crilly, A., 1977, 'Drogheda's markets and fairs', J Old Drogheda Soc, 2, 10-13

Garry, J. 1977 "Townland Survey of County Louth (Continued)", *Journal of the County Louth Archaeological and Historical Society* 19(1), 59-66. Stable URL: <https://www.jstor.org/stable/27729439>

Garry, J., 1996, The Streets and Lanes of Drogheda. Drogheda.

Garry, J. (1990). Townland Survey of County Louth: Mell (Continued). *Journal of the County Louth Archaeological and Historical Society*, 22(2), 150–165. <https://doi.org/10.2307/27729694>

Davies, O. 1944 "Old Churches in County Louth. (Continued)", *Journal of the County Louth Archaeological Society* 10(4), 277-296. Stable URL: <https://www.jstor.org/stable/27728610>

Gogarty, T., 1915, Council Book of the Corporation of Drogheda, vol. 1, 1649 to 1734. Drogheda (Reprinted 1988)

RECEIVED: 01/11/2024

- Gwynn, A. & Hadcock R.N., 1970, *Medieval Religious Houses Ireland*. Dublin
- Harris, F.E, Trought, M.E (January 1954) 'Mineral Trade Notes' Vol 38, No.1 US Department of the Interior.
- Halpin, E. 1988 Dromiskin: Souterrains, later features. In I. Bennett, I (ed) *Summary accounts of archaeological investigations in Ireland*. Dublin
- Leask, H. J., 1971, *Irish churches and monastic buildings*, Vol. 3, Dundalgan Press, Dundalk.
- Lewis, S. 1837 *A Topographical Dictionary of Ireland*.
- Mac Iomhair, D., 1961, 'Two old Drogheda chronicles', *J Co Louth Archaeol Hist Soc*, 15, 88-95
- Mac Niocaill, G., 1964, *Na Buirgéisí XII-XV Aois*. 2 vols. Dublin
- Mills, J. & McEnery, M.J., 1916, *Calendar of the Gormanston Register*. Dublin
- Murphy, D., 1997, '11 Dyer Street, Drogheda, Co. Louth' in Bennett, I. (ed.), *Excavations 1996*. Bray: Wordwell Ltd.
- Murphy, D., 1997, 'Moneymore, Drogheda, Co. Louth' in Bennett, I. (ed.), *Excavations 1996*. Bray: Wordwell Ltd.
- Murphy, D., 1998, '10 Dyer Street, Drogheda, Co. Louth' in Bennett, I. (ed.), *Excavations 1997*. Bray: Wordwell Ltd.
- Murphy, D., 2000, '12/13 Shop Street/Dyer Street, Drogheda, Co. Louth', in Bennett, I. (ed.), *Excavations 1998*. Bray: Wordwell Ltd.
- Murphy, D., 2001a, 'Dyer Street, Drogheda, Co. Louth' in Bennett, I. (ed.), *Excavations 1999*. Bray: Wordwell Ltd.
- Murphy, D., 2001b, 'Town Centre, Dyer Street, Drogheda, Co. Louth' in Bennett, I. (ed.), *Excavations 1999*. Bray: Wordwell Ltd.
- O'Callaghan Moran and Associates (OCM). 2016. 'Risk Screening and Technical Assessment'.
- Ó Drisceoil, C. 2000 Coolfore. In I. Bennett, I (ed) *Summary accounts of archaeological investigations in Ireland*. Dublin
- O' Sullivan, H. 1999 The Tichborne acquisition of the Plunkett estate of Beaulieu. *The Journal of the Old Drogheda Society* Vol 7.
- Roe, H. 1969 "Cadaver Effigial Monuments in Ireland", *The Journal of the Royal Society of Antiquaries of Ireland* 99(1), 1-19. Stable URL: <https://www.jstor.org/stable/25509699>
- Seaver, M. 2000 Platin Fort. In I. Bennett, I (ed) *Summary accounts of archaeological investigations in Ireland*. Dublin
- Thomas, A., 1975, 'Drogheda, 1574', *J Co Louth Archaeol Hist Soc*, 18, 179-86
- Thomas, A., 1992, *The Walled Towns of Ireland*. 2 vols. Dublin
- White, N. B., 1943, *Extents of Irish Monastic Possessions, 1540-41*. Dublin

#### ELECTRONIC SOURCES

- [www.excavations.ie](http://www.excavations.ie) – Summary of archaeological excavation from 1970–2022.
- [www.archaeology.ie](http://www.archaeology.ie) – DHLGH website listing all SMR/RMP sites.
- [www.heritagemaps.ie](http://www.heritagemaps.ie) – The Heritage Council web-based spatial data viewer which focuses on the built, cultural and natural heritage.
- [www.googleearth.com](http://www.googleearth.com) – Satellite imagery (2005–2022).

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www.logainm.ie – Placenames Database of Ireland, developed by Fiontar (DCU) and The Placenames Branch (DoAHG).

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## 16 Major Accidents & Disasters

### 16.1 Introduction

This chapter has been prepared to describe the likely significant effects on the environment arising from the vulnerability to risks of major accidents and/or disasters during the construction and operational phases at the Premier Periclase Ltd. (PPL) Site at Boyne Avenue, Newtownstalaban, Drogheda, Co. Louth. This chapter should be read in conjunction with Chapters 2, 7, 8, 11, 17 and 18 of this EIAR.

Based on the results of the assessment, the necessary mitigation measures to minimise and where possible eliminate any potential effects are described.

### 16.2 Assessment Methodology

#### 16.2.1 Relevant Guidelines, Policy and Legislation

The assessment of the vulnerability of the Proposed Development to major accidents and disasters is carried out in accordance with the terms of the EIA Directive<sup>170</sup> as amended that entered into force in Ireland on 16 May 2017, which states the need to assess:

- “the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned”

The underlying objective of this assessment is to ensure that appropriate precautionary actions are taken for any development projects which *“because of their vulnerability to major accidents and/or natural disasters, are likely to have significant adverse effects on the environment”*.

Based on the requirements of the EIA Directive and the 2022 EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports, this chapter seeks to determine:

- The relevant major accidents and/or disasters, if any, that the Proposed Development could be vulnerable to;
- The potential for these major accidents and/or disasters to result in likely significant adverse environmental effect(s);
- The measures that are in place, or need to be in place, to prevent or mitigate the potential significant adverse effects of such events on the environmental and details of the preparedness for and proposed response to such emergencies.

Major accidents and/or disasters are hazards that have the potential to affect and be affected by the Proposed Development. These include accidents during the demolition, construction and operational phases caused by operational failure and/or natural hazards.

The identification, control and management of risk is an integral part of the design and assessment process throughout all stages of a project lifecycle. The elements of the Proposed Development that incorporate measures that are designed to eliminate, reduce, isolate or mitigate the occurrence of major accidents have been described throughout this EIAR, where required. Measures to control risks associated with Construction Phase activities are incorporated into the Outline Construction Environmental Management Plan (CEMP) – see *Chapter 2 Description of Proposed Development*.

A risk analysis-based methodology that covers the identification, likelihood and consequence of major accidents and/or disasters has been used for this assessment. The scope and methodology presented in the following sections is based on the provisions of the EIA Directive, EPA Guidelines

<sup>170</sup> Council Directive 2011/92/EU of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, OJ L 26 as amended by Directive 2014/52/EU of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, OJ L 124 (EIA Directive)



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and guidance documents and other published risk assessment methodologies as described below in Section 16.2.2, as well as professional judgement.

### Legislation

The following paragraphs are set out in the EIA Directive in relation to major accidents and/or disasters.

Recital 15 of the EIA Directive states that:

- “In order to ensure a high level of protection of the environment, precautionary actions need to be taken for certain projects which, because of their vulnerability to major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes) are likely to have significant adverse effects on the environment. For such projects, it is important to consider their vulnerability (exposure and resilience) to major accidents and/or disasters, the risk of those accidents and/or disasters occurring and the implications for the likelihood of significant adverse effects on the environment. In order to avoid duplications, it should be possible to use any relevant information available and obtained through risk assessments carried out pursuant to Union legislation, such as Directive 2012/18/EU of the European Parliament and the Council (4) and Council Directive 2009/71/Euratom, or through relevant assessments carried out pursuant to national legislation provided that the requirements of this Directive are met.”

Note: Directive 2012/18/EU is the directive on the Control of Major Accident Hazards involving dangerous substances, referred to as the COMAH or Seveso III Directive.

Article 3 of the EIA Directive provides that the EIAR shall identify, describe and assess in the appropriate manner, the direct and indirect significant effects on population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage and landscape deriving from (amongst other things) the “the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned”.

Specifically, the information relevant to major accidents and/or disasters to be included in the EIAR is set out in Section 8 of Annex IV of the EIA Directive as follows:

- “A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.”

### Guidance Documents

Several guidance documents and published plans have been reviewed and considered in order to inform this assessment as described in the following sections.

#### **Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)**

The European Commission Guidance outlines the legislative and key considerations that should be taken into account in the preparation of EIARs with respect to major accidents and/or disasters.

The Guidance lists the following issues which EIARs should address:

- What can go wrong with a Project?
- What adverse consequences might occur to human health and to the environment?
- How likely are these consequences?
- What is the Project’s state of preparedness in case of an accident/disaster?
- Is there a plan for an emergency situation?

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## **Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022)**

The EPA Guidelines refer to major accidents and/or disasters in several sections including:

- Characteristics of the Project – Under Section 3.5.2, it is stated that the project characteristics should include “a description of the Risk of Accidents – having regard to substances or technologies used.”
- Assessment of effects – under Section 3.7.1 it is stated that the assessment of effects should, in accordance with Annex IV (5) of the EIA Directive, include “the risks to human health, cultural heritage or the environment (for example due to accidents or disasters).”
- Likelihood of effects – Under Section 3.7.3 it is stated that “To address unforeseen or unplanned effects the Directive further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and/or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and/or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk). This may be supported by general risk assessment methods or by systematic risk assessments required under other regulations e.g. a COMAH (Control of Major Accident Hazards involving Dangerous Substances) assessment.”

## **Guidance of Assessing and Costing Environmental Liabilities (EPA, 2014)**

The EPA has developed guidance that presents a systematic approach for assessing and costing environmental liabilities associated with the closure, restoration/aftercare and incidents associated with licensed facilities. This guidance is targeted at activities governed by EPA authorisations including Industrial Emissions Directive (IED), Integrated Pollution Prevention and Control (IPPC), wastewater discharge authorisations (WWDA) and dumping at sea (DaS) regimes.

Specifically, this document provides guidance on the identification and quantification of risks, focusing on unplanned, but possible and plausible events that may occur during the construction and operational phases of projects. Guidance is also provided on a range of risk assessment and evaluation techniques that could be employed.

## **A framework for Major Emergency Management Guidance Document 1-A Guide to Risk Assessment in Major Emergency Management (Government of Ireland, 2010)**

The Department of the Environment, Heritage and Local Government, as it then was, published a guidance note<sup>171</sup> in January 2010 on best practice in the area of risk assessment for major emergency management.

This guidance sets out a risk assessment procedure that should be applied and documented by the principal response agencies as a basis for major emergency management. The risk assessment procedure underpins work in the later stages of the emergency management cycle. A significant benefit of the risk assessment process is that it can help establish confidence in the Major Emergency Management system, by showing it to be both realistic and logical.

This document describes the various stages of the risk assessment process and how it should be employed to inform mitigation and detailed planning during major emergency situations. Part 1 of the guidance sets out the risk assessment process and defines criteria for classifying impact and likelihood scenarios, as well as a process for recording the risk assessment.

## **National Risk Assessment for Ireland 2019 (Government of Ireland, 2019)**

The most recent National Risk Assessment forms a critical subset of the strategic process (‘National Risk Assessment: Overview of Strategic Risks’) undertaken by the Government on an annual basis to assess national risks. The purpose of the assessment is to identify national hazards across a broad range of emergencies, to assess the likelihood and effect of these risks

<sup>171</sup> Department of the Environment, Heritage and Local Government (2010) A Guide to Risk Assessment in Major Emergency Management. Available from: <https://www.gov.ie/en/publication/37414-a-guide-to-risk-assessment-in-major-emergency-management-january-2010/> (Accessed November 2022)

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and to inform actions at national level aimed at mitigating such risks, including the allocation of resources.

### 16.2.2 Sources of Information

The assessment presented in this Chapter has been based on both a desktop review of existing information and as well as site specific investigation data acquired from the site of the Proposed Development, as follows:

- AtkinsRéalis (2024) “*CORE Flood Risk Assessment*” (Report no. BEC231-ATK-XXX-XXXX-XX-RP-CE-300002; enclosed in this planning application);
- AtkinsRealis (2024) “Tier 2 Generic Quantitative Risk Assessment Report Proposed CORE Development )” (Report no.0088045DG0015; enclosed in this planning application);
- Google (2024) Google Earth Aerial Photography (accessed June 2024). Available at: <https://www.google.com/maps>
- HSA (2024) List of Upper Tier Establishments (accessed June 2024). Available at [Upper Tier - hsa.ie](https://hsa.ie)
- HSA (2024) List of Lower Tier Establishments (accessed June 2024). Available at [Lower Tier - hsa.ie](https://hsa.ie)
- EPA (2024) IE/IPC application, licence or environmental information (accessed June 2024). Available at [Environmental Protection Agency \(epa.ie\)](https://epa.ie)

Establishing the local and regional context, prior to completion of the risk assessment, enables a better understanding of the vulnerability and resilience of the area to emergency situations, and of the potential for the surrounding environment to pose a risk of a major accident or disaster, which could affect the Proposed Development. Section 16.3 provides an overview of the baseline environment that has been considered for this assessment.

### 16.2.3 Impact Assessment Methodology

#### Risk Assessment Methodology - Overview

The site-specific risk assessment identifies and quantifies risks focusing on unplanned, plausible incidents occurring during the construction and operational phase of the Proposed Development. The following steps were undertaken as part of the site-specific risk assessment:

- Identification of potential risks;
- Risk classification – likelihood and consequence assessment;
- Risk evaluation.

#### Identification of Potential Risks

In accordance with the EC Guidance, potential risks are identified in respect of:

1. Potential vulnerability to major accident or disaster, and
2. Potential to cause major accidents and/or disasters.

The identification of potential risks has focused on non-standard but plausible incidents, which could occur at the Proposed Development during demolition, construction and operation, and which could cause a non-trivial impact on the environment. Similarly, if an off-site event could cause the Proposed Development to have a non-trivial impact on the environment, this was also classified as a plausible risk.

#### Risk Classification

##### Classification of Likelihood

Once the potential risks were identified, the likelihood of occurrence of each was assessed. The effectiveness of safety procedures and pollution prevention measures was considered when estimating the likelihood of an identified potential incident occurring. Table 16.1 indicates the likelihood ratings that have been applied. These ratings are in accordance with A Framework for

Major Emergency Management A Guide to Risk Assessment in Major Emergency Management Guidance Document 1 (Department of Housing, Local Government and Heritage, July 2010).

The approach adopted has assumed a 'risk likelihood' where one or more aspects of the likelihood description are met.

**Table 16.1:** Risk Classification Table – Likelihood

| Ranking | Likelihood         | Description                                                                                                                                                                                                                                               |
|---------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | Extremely Unlikely | May occur only in exceptional circumstance; once every 500 or more years.                                                                                                                                                                                 |
| 2       | Very Unlikely      | Is not expected to occur; and/or no recorded incidents or anecdotal evidence; and/or very few incidents in associated organisations, facilities or communities; and/or little opportunity, reason or means to occur; may occur every 100-500 years.       |
| 3       | Unlikely           | May occur at some time; and/or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisation's worldwide; some opportunity, reason or means to occur; may occur once per 10-100 years. |
| 4       | Likely             | Likely to or may occur; regular recorded incidents and strong anecdotal evidence and will probably occur once per 1-10 years.                                                                                                                             |
| 5       | Very Likely        | Very likely to occur; high level of recorded incidents and/or strong anecdotal evidence. Will probably occur more than once a year.                                                                                                                       |

#### Classification of Consequence

When assigning the consequence rating to each potential risk, it has been assumed that mitigation measures and/or safety procedures have failed to prevent an effect on the environment. The consequence rating of the effect, if the incident occurs, is indicated in Table 16.2.

The consequence of a potential risk to the Proposed Development has been determined where one or more aspects of the consequence description are met i.e. potential risks that have no consequence have been excluded from the assessment. These consequences are in accordance with A Framework for Major Emergency Management A Guide to Risk Assessment in Major Emergency Management Guidance Document 1 (Department of Housing, Local Government and Heritage, July 2010).

**Table 16.2:** Risk Classification Table – Consequence

| Ranking | Consequence | Effect                                                           | Description                                                                                                                                                                                                                                                                                                                                                                                   |
|---------|-------------|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | Minor       | Life, Health, Welfare<br>Environment<br>Infrastructure<br>Social | Small number of people affected; no fatalities and small number of minor injuries with first aid treatment.<br>No contamination, localised effect <€0.5M<br>Minor localised disruption to community services or infrastructure (<6 hours).                                                                                                                                                    |
| 2       | Limited     | Life, Health, Welfare<br>Environment<br>Infrastructure<br>Social | Single fatality; limited number of people affected; a few serious injuries with hospitalisation and medical treatment required.<br>Localised displacement of a small number of people for 6-24 hours. Personal support satisfied through local arrangements.<br>Simple contamination, localised effects of short duration<br>€0.5-3M<br>Normal community functioning with some inconvenience. |

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| Ranking | Consequence  | Effect                                                                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------|--------------|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3       | Serious      | Life,<br>Health,<br>Welfare<br>Environme<br>nt<br>Infrastruct<br>ure<br>Social | Significant number of people in affected area impacted with multiple fatalities (<5), multiple serious or extensive injuries (20), significant hospitalisation.<br>Large number of people displaced for 6-24 hours or possibly beyond; up to 500 evacuated.<br>External resources required for personal support.<br>Simple contamination, widespread effects or extended duration<br>€3-10M<br>Community only partially functioning, some services available. |
| 4       | Very Serious | Life,<br>Health,<br>Welfare<br>Environme<br>nt<br>Infrastruct<br>ure<br>Social | 5 to 50 fatalities, up to 100 serious injuries, up to 2000 evacuated<br>Heavy contamination, localised effects or extended duration<br>€10-25M<br>Community functioning poorly, minimal services available                                                                                                                                                                                                                                                    |
| 5       | Catastrophic | Life,<br>Health,<br>Welfare<br>Environme<br>nt<br>Infrastruct<br>ure<br>Social | Large numbers of people impacted with significant numbers of fatalities (>50), injuries in the hundreds, more than 2000 evacuated.<br>Very heavy contamination, widespread effects of extended duration.<br>>€25M<br>Serious damage to infrastructure causing significant disruption to, loss of, key services for prolonged period.<br>Community unable to function without significant support.                                                             |

### Risk Evaluation

Once classified, the likelihood and consequence rating have been multiplied to establish a 'risk score' to support the evaluation of risks by means of a risk matrix.

The risk matrix (as outlined in Table 16.3) indicates the critical nature of each risk. The risk matrix has been applied to evaluate each of the risks associated with the Proposed Development. The risk matrix is colour codes to provide a broad indication of the critical nature of each risk:

- The red zone represents 'high risks';
- The amber zone represents 'medium risks'; and
- The green zone represents 'low risks'.



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**Table 16.3: Risk Matrix**

|                           |                           |          |              |                |                |                     |                     |
|---------------------------|---------------------------|----------|--------------|----------------|----------------|---------------------|---------------------|
| <b>Likelihood Rating</b>  | <b>Very likely</b>        | <b>5</b> |              |                |                |                     |                     |
|                           | <b>Likely</b>             | <b>4</b> |              |                |                |                     |                     |
|                           | <b>Unlikely</b>           | <b>3</b> |              |                |                |                     |                     |
|                           | <b>Very unlikely</b>      | <b>2</b> |              |                |                |                     |                     |
|                           | <b>Extremely unlikely</b> | <b>1</b> |              |                |                |                     |                     |
|                           |                           |          | <b>Minor</b> | <b>Limited</b> | <b>Serious</b> | <b>Very Serious</b> | <b>Catastrophic</b> |
|                           |                           |          | <b>1</b>     | <b>2</b>       | <b>3</b>       | <b>4</b>            | <b>5</b>            |
| <b>Consequence Rating</b> |                           |          |              |                |                |                     |                     |

## 16.3 Receiving Environment

### 16.3.1 Disasters

Ireland's geographic position means it is less vulnerable to natural disasters such as earthquakes or tsunamis, which might pose risk to projects of this nature and scale in other locations. However, in recent times there has been an increase in the number of severe weather events in the country, particularly those leading to flash flooding, snow, lower than usual temperatures and strong winds.

### 16.3.2 Major Accidents

The Chemical Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations, 2015 transpose the Seveso III Directive (2012/18/EU) into Irish law. These regulations replace the European Communities (Control of Major Accident Hazards Involving Dangerous Substances) Regulations, 2006 and 2013. The purpose of the COMAH Regulations is to lay down rules for the prevention of major accidents involving dangerous substances, and to seek to limit as far as possible the consequences for human health and the environment of such accidents, with the overall objective of providing a high level of protection in a consistent and effective manner.

The proposed development will not contain qualifying inventories of dangerous substances, and therefore is not designated as a COMAH site.

### 16.3.3 Licenced Facilities

The existing Premier Periclase Ltd. (PPL) site is currently licenced under Industrial Emissions (IE) Licence P0376-02, for the following activities:

- Production of lime in kilns with a production capacity exceeding 50 tonnes per day.
- Landfills, within the meaning of section 5 (amended by Regulation 11(1) of the Waste Management (Certification of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008 (S.I. No 524 of 2008)) of the Act of 1996, receiving more than 10 tonnes of waste per day or with a total capacity exceeding 25,000 tonnes, other than landfills of inert waste.

It is noted that the licenced activity to be carried out at the Proposed Development is unrelated to the existing Industrial Emissions licensed activity at the site.

### 16.3.4 Surrounding Environment

The subject site is located along the northern bank of the River Boyne, ca. 2km to the east of Drogheda town centre. The site is bound to the south by the Strand Road (R167) and the River Boyne beyond, and to the southeast by the Drogheda Port Company Tom Roe's Point Terminal. Logistics and commercial units, and agricultural lands are located to the north, the L2307 Road and industrial and commercial units are located to the northwest, and undeveloped lands to the east.

The River Boyne is designated as a Special Area of Conservation (SAC) according to the National Parks and Wildlife Service (River Boyne and River Blackwater SAC. Site Code: 002299). The Boyne Estuary Special Protection Area (SPA) (Site Code: 004080) is located adjacent to the subject site and extends up to the site along the River Boyne, and also takes in an area of marsh on the opposite side of the Boyne to the subject site. The Boyne Coast and Estuary SAC (Site Code: 001957) is also adjacent to the subject site. The boundaries of all SACs and SPAs lie outside the boundary of the Proposed Development site.

The closest existing dwelling is located ca. 250m to the north and the closest existing residential area is located ca. 290 m to the west. The lands immediately to the west of the site are zoned for residential development, with permission recently granted for a Large Scale Residential Development (LRD) on the lands. The LRD application received a final grant of permission under Louth County Council (LCC) Reg. Ref.: 2360053. The permitted development consists of 42 no. dwelling homes and 150 no. apartments as well as non-residential childcare facility, cafe, gym and community space. This permitted development has been considered fully in the development of the current application.

There is 1 no. COMAH designated site in relatively close proximity to the Proposed Development. Establishments which fall under the remit of COMAH Regulations are classified “lower tier” or “upper tier” sites. Refer to Table 16.4 for details, which identifies the nearest COMAH sites to the proposed site, their activity and relevant tier.

**Table 16.4:** COMAH Sites in Proximity to CORE

| Operator            | COMAH Tier | Activity    | Approx. distance from site |
|---------------------|------------|-------------|----------------------------|
| Flogas Ireland Ltd. | Upper Tier | LPG Storage | 0.5km                      |

COMAH regulations require operators of establishments where dangerous substances are used or stored in large quantities to take all measures necessary to prevent and mitigate the effects of major accidents to man and the environment. A section of the proposed development is located within the consultation distance for Flogas, and has been identified as being within the Outer Land Use Planning Zone for Flogas. There are no significant quantities of dangerous substances stored at the proposed development. Therefore, a major accident at Flogas would not increase the possibility or consequences of a major accident at CORE.

#### Industrial Emissions Licences

The closest site to the Proposed Development, which operates under an IE Licence as issued by the EPA, is Drogheda Port Company. Additionally, there are a number of IE-licenced sites near the Proposed Development; these sites are involved in the recovery or disposal of non-hazardous waste, coating, milk treatment and processing, poultry farm and a DC. Table 16.5 provides further detail and distances.

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**Table 16.5:** IE Licenced Sites in proximity to CORE

| Operator                          | Licenced Ref. | Activity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Approx. distance from site |
|-----------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| Drogheda Port Company             | P1011-01      | Recovery, or a mix of recovery and disposal, of non-hazardous waste with a capacity exceeding 75 tonnes per day involving one or more of the following activities, (other than activities to which the Urban Waste Water Treatment Regulations 2001 (S.I. No. 254 of 2001) apply):<br>(i) biological treatment;<br>(ii) pre-treatment of waste for incineration or co-incineration;<br>(iii) treatment of slags and ashes;<br>(iv) treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of-life vehicles and their components | 500 m                      |
| Boylan Print Ltd.                 | P0784-01      | The use of coating materials in processes with a capacity to use at least 10 tonnes per year of organic solvents, not included in paragraph 12.2.1                                                                                                                                                                                                                                                                                                                                                                                                                          | 600 m                      |
| Tirlan Ltd.                       | P0799-01      | The treatment and processing of milk, the quantity of milk received being greater than 200 tonnes per day (average value on a yearly basis)                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1.5 km                     |
| Belview Egg Farm Ltd.             | P0934-01      | The rearing of poultry in installations, whether within the same complex or within 100 metres of the same complex, where the capacity exceeds 40,000 places                                                                                                                                                                                                                                                                                                                                                                                                                 | 3.3 km                     |
| Amazon Data Services Ireland Ltd. | P1181-01      | Combustion of fuels in installations with a total rated thermal input of 50 MW or more.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4 km                       |

## 16.4 Characteristics of the Proposed Development

The Proposed Development to which this planning application relates is the first phase of CORE, and will consist of extensive works that will transform the ca. 35.6 hectare site and set it on a path that will result in it becoming a sustainably powered enterprise campus. It is noted that the

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Proposed Development is unrelated to the existing Industrial Emissions licensed activity at the site. The Proposed Development consists of:

- The demolition of existing buildings, structures, and services associated with the PPL facility, as well as site clearance and remediation works.
- The careful sequestering of the licensed (inert) landfill onsite in accordance with all ongoing and future requirements of the EPA.
- A number of existing buildings and structures will be maintained as part of the Proposed Development, such as a Workshop Building, part of a Crane Store structure, 3 no. Lime Silos and water tanks and infrastructure, all of which have been incorporated into the design where beneficial and appropriate.
- The construction of a three storey Energy Centre (EC) building, a three storey Data Centre (DC) building, a single storey Facility Operations Centre (FOC) building, a single storey Pump and Filtration Building, a single storey Security Gatehouse and a Security Kiosk at the main site entrance of the site.
- The provision of a Battery Energy Storage System (BESS) Compound, an ESB Substation, a Cooling Compound, a Thermal Store Compound, a Pump and Filtration System, other ancillary structures including a Firewater Tank, a Fire Fighting Water Pump Building, a Control Building, a Maintenance Yard and Waste Management facilities. Ground-mounted solar Photo Voltaic (PV) arrays will also be provided on the existing licensed landfill and stockpile no. 3.
- The provision of all associated works including access arrangements, internal roadways and footpaths, car and cycle parking, boundary treatments, landscaping and services, and all ancillary works.

A detailed description of the Proposed Development is included in *Chapter 2 Description of Proposed Development* of this EIAR, which includes details of the demolition works required, details of the construction of the new buildings and structures, and details of the various elements that will make up the Proposed Development when it will be operational.

The following subsections provide a summary of the various phases of the Proposed Development which have the potential to give rise to major accidents or disasters. See *Chapter 2 Description of Proposed Development* for further details.

#### **16.4.1 Construction Phase (Including Demolition)**

Following the successful grant of planning permission, and receipt of other required statutory permissions, on-site works would commence. See *Chapter 2 Description of Proposed Development* for further details.

##### **Demolition Works**

##### **Clean Down of Facility**

After the last batch of production, all remaining stock will be sold or retained on-site for use in reinstatement of the production area and capping of the EPA licenced landfill.

All wastes that are not suitable for disposal to the landfill will be removed from the site by an authorised waste collector and sent to authorised waste management facilities.

Existing services which will become redundant will be isolated and temporary re-routing will be carried out on utilities which are required for enabling works to take place and provide for mitigations.

##### **Clean to Shell**

Utilising the Clean-Out Plan and Schedule of execution, the sequence of Clean-out will occur upon the cessation of activities for the equipment, systems and buildings.

##### **Asbestos Removal**

A refurbishment/demolition asbestos survey (RDAS) has been carried out for every structure to be demolished, which clearly identifies structures that contain asbestos materials. Soil sampling has also identified asbestos in made ground underneath the site as well as in buried pipework.

All asbestos will be removed by competent contractors prior to commencing demolition of the relevant structures, in accordance with The Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations, 2006 & 2010 and all amendments thereto.

### **Building Demolition**

The redundant plant and structures to be demolished range from free standing process vessels/tanks/etc., to open steel framed process structures, concrete/brick buildings, large, sectioned steel framed buildings and specialist structures (furnaces, heaters, boilers, etc.)

A variety of demolition techniques will be used for the Proposed Development.

Due to the height of the Multi Hearth Furnace Building, Briquetting Building, Briquette Silo, Shaft Kiln Building and the chimney structures, the use of specialist designed explosive demolition may be required as determined by the contractor.

### **Landfill Closure**

As part of the Proposed Development, PPL will carefully sequester the licensed (inert) landfill onsite in accordance with all ongoing and future requirements of the EPA and the EPA IE licence at the site.

### **Excavation Works**

Following completion of the site enabling works, all new buildings and structures will require foundations to structural engineer specifications. These will require moderate scale excavations.

### **Demolition and Construction Waste**

Where feasible materials and equipment will be re-purposed or reused. Where an element of the building or equipment is deemed unable to be used economically within the proposed scheme it will be disposed of in the correct process, i.e. by an appropriately licensed waste contractor to an appropriately licensed waste facility.

Table 2.1 lists the types of materials that are expected to be generated by the Decontamination / Decommissioning, Demolition and Construction Phases.

Further details are provided in the Resource and Waste Management Plan (RWMP) which accompanies this planning application. The RWMP has been prepared in accordance with the relevant EPA Guidance<sup>172</sup>.

## **16.4.2 Operational Phase**

The following subsections provide a summary of the various phases of the Proposed Development which have the potential to give rise to major accidents or disasters. Full details are in See *Chapter 2 Description of Proposed Development* for further details.

### **Campus Operations**

Once construction is complete and the Proposed Development is fully operational, it will be a 24/7 campus with personnel on site at all times. The site personnel will consist of

- Security Operations Centre (SOC) team
- Network Operations Centre (NOC)
- The Facilities Operations Centre (FOC) team

<sup>172</sup> EPA (2021) "Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects"



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A dedicated energy services company (ESCo) team will be established to operate and maintain all energy services and utilities on the campus with the core objective of providing safe, reliable energy and utility services to campus consumers on their behalf.

The existing Wharf will be maintained under the current lease and will be monitored and operated safely by the FOC team as it has been since the lease was first granted in the 1930s.

### **On-Site Kinetic Energy Storage & Power Quality (UPS) (Primary Reserve)**

Central to the power electronics line-up is a Medium Voltage (MV) Rotary Uninterruptible Power Supply (UPS) System with a capacity of 37.8 MW coupled to a Rotary Kinetic Energy Storage system. This parallel array will provide protection from a broad spectrum of utility voltage events and will supply continuous clean power to the protected load with enough autonomy to support it for 20 seconds.

The power characteristics and inertia of this rotating machine will ensure smooth transitions between the various energy generation and storage systems that support the load including: solar generation; gas generation; battery energy storage; and the grid itself.

As well as protecting the Load, it is also configured to protect the grid. Many of the frequency containment services at other sites that are exported to the grid are delivered through the power electronics of the UPS System.

### **On-Site Battery Energy Storage System (BESS) (Secondary Reserve)**

The BESS is a 36 MW grid-scale lithium-ion battery array that acts as a secondary reserve to the UPS system. For load protection, it takes over from the UPS system up to 200 ms, which preserves approximately 99% autonomy of the UPS and supports the design load for up to 3 hours.

The BESS has a central role in displacing real-time emissions. It will store renewable electricity from the grid when available and discharge during periods of higher grid emissions intensity. Time-shifting of electricity consumption (emissions) is a key element of the demand response characteristics of the site.

It also has the ability to potentially provide a comprehensive range of grid services (frequency containment and restoration) and can displace conventional generators that provide these services. Due to its quicker response, it can provide these services without taking up the capacity that “must-run” generators do, and significantly decarbonise the operation of the grid itself.

Generally, the BESS batteries will charge at night when electricity demand on the grid is low, and when there tends to be an abundance of renewables available which of course is because of the low demand. This development therefore prevents the curtailment of the renewable generators active at that time. The batteries are discharged in the following evening peak, when demand is high, to help reduce peak demand on the grid.

### **On-Site Gas Engines (Tertiary Reserve)**

Tertiary reserve will be provided from nine 4.5 MW (electrical output) reciprocating gas engines allowing a gradual hand-off of load from the batteries.

The engines are constrained to operate only if they outperform the marginal generator on the grid for emissions intensity. They are used for demand response but could export at times when there is a scarcity of generation on the grid should there be an agreement in place with the Systems Operator for the provision of such services.

### **Gas Connection and Storage**

Gas Networks Ireland’s (GNI) Drogheda Transmission Station is located adjacent to the PPL site and operates at 70 bar, which in-turn provides a 4 bar connection to an existing Above-Ground Installation (AGI) on the PPL site to serve the site gas requirements. The on-site gas distribution AGI will be modified and upgraded to suit the new operations on site. A new natural gas ring main will be constructed in order to provide a gas supply to the EC for the engines via a manifold.

### **Energy Centre (EC) Building**

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The CORE EC Building will house the gas engines, the UPS and MV switchgear. There will be 9 no. 4.5 MW gas engines housed within the EC Building. Each engine will have its own waste gas exhaust stack at a height of 28.9 m above ground level. The existing chimney on site are at a height of ca. 66m; therefore the proposed stacks will be significantly lower than the existing reducing the visual effects from the site.

The EC Building will act as the primary supporting building to the DC, generating all of the energy requirements for the successful functioning of the data halls.

### **Existing Seawater Infrastructure**

Baltray Pump Station, located approximately 3 km east of the site boundary, on the downstream River Boyne and estuary, is an abstraction point for seawater registered with the EPA under Water Abstractions Register No. R00514-01.

Figure 2.10 (*Chapter 2 Description of Proposed Development*) presents the indicative route of the licenced discharge pipeline. Treated spent seawater and surface water runoff from the site (after having undergone a settlement treatment process), flows by gravity from the weir outfall at the site via the discharge pipeline, which runs parallel to the seawater supply pipeline as far as the pump station at Baltray Reservoir and then continues onwards to the outfall point in the Irish Sea. The outfall is Emission Point SW1, located at easting northing coordinates E316884, N277175, and is licenced under the EPA Industrial Emissions Licence. The water discharged via SW1 is subject to a settlement treatment process, sampling and monitoring regime.

It is intended to maintain the registered seawater abstraction and the licenced SW1 discharge point for the proposed CORE development as described in Section 2.5.6.

### **Continuing use of Existing Freshwater and Seawater Abstraction Infrastructure for Proposed Development**

The existing seawater and freshwater abstraction and discharge infrastructure will continue to be operated as per the current situation onsite, within EPA registered limits and in accordance with the EPA Industrial Emissions Licence (IEL).

- Abstracted seawater from Baltray Reservoir will be used to reduce the pH of surface water runoff from the site to comply with IEL limits, as required. The surface water undergoes a settlement treatment process before being combined with seawater and is then discharged to sea via licenced emission point, SW1.
- Abstracted freshwater from the Littlegrange and Mell Quarry intake regime will be used for the industrial processes within the site and discharged to sea via licenced emission point, SW1 (except for the freshwater used for the DC cooling system, which will be released to air by evaporation). Ongoing abstraction of freshwater at Mell Quarry also serves to manage water levels in the disused quarry and prevents flooding of water abstraction infrastructure located on the eastern side of the quarry.
- The water discharged via SW1 will be subject to a sampling and monitoring regime.

The existing seawater and freshwater infrastructure serving the site is a valuable resource that PPL may seek to use in potential future industrial processes within the landholding, including potential decarbonisation applications. Given such potential future processes are not known, they are not part of the Proposed Development to which this planning application relates.

### **Site Drainage**

#### **Wastewater**

The PPL site is serviced by the existing Uisce Éireann 150 mm diameter foul sewer at the entrance road to the west of the site. Sanitary/foul wastewater is discharged to this Uisce Éireann foul sewer and ultimately to Drogheda Wastewater Treatment Plant.

The Proposed Development's wastewater feed that will be discharged to the sewerage system will again only be related to activity in the office buildings (sanitary/foul) and not the EC or DC operations.

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### **Surface Water**

All surface water runoff from the site will be collected in the site's storm water system. Abstracted seawater from Baltray Reservoir will be used to reduce the pH of surface water runoff from the site to comply with IEL limits, as required. The surface water undergoes a settlement treatment process before being combined with seawater and is then discharged to sea via licenced emission point, SW1.

There is 1 no. existing storm water discharge point to the Boyne River at the main entrance to the site. Currently storm water from main entrance area of the site discharges to the Boyne River. As part of the Proposed Development, an attenuation/soakaway will be installed close to the location where the drainage leaves the site. The soakaway will be sized to accommodate a 100 year rainfall event including a 20% climate change factor of safety, and store all the water, resulting in no discharge from the existing discharge point to the Boyne River for rainfall events less than 100 years. This water will discharge to groundwater by infiltration. An overflow will be connected to the existing outfall for cases where the inflow exceeds the 100 year rainfall events. The overflow will be fitted with a bypass separator to filter out any hydrocarbons.

### **Fire Water Runoff**

The BESS could have potentially contaminated fire water runoff in the event of a fire. The BESS is external and will be provided with sealed concrete pavements with upstands to ensure that no contaminated runoff could discharge to, and potentially contaminate, surface water and/or groundwater. In the event of a fire at the BESS, firewater runoff will drain to the attenuation tank under the BESS. This retention tank will be fitted with a pH-controlled actuator on the outfall. Once contaminated water from a fire is detected, the outfall will close automatically, turning it into a firewater run-off storage tank.

A foul sewer will be installed under the DC and EC to collect potentially contaminated fire water runoff in the event of a fire. It is proposed to pump this water to the attenuation tank/contaminated water tank under the BESS.

Contaminated firewater collected in the attenuation tank will be pumped out and removed off site in tankers.

The above system has been designed in accordance with the requirements of the *EPA Guidance on Retention Requirements for Firewater Run-off (2019)*.

## **16.5 Potential Effects**

### **16.5.1 Construction Phase (including Demolition) - Risk Assessment**

Seven potential risks specific to the demolition/construction phase of the Proposed Development have been identified. These are outlined in the demolition / construction phase risk register in Table 16.6.

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**Table 16.6:** Risk Register – Demolition / Construction Phase

| Risk ID | Potential Risk                                                                                                                                                 | Possible Cause                                                                                                                                                                                                                                                                                                                          |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C1      | Contamination of the waterbodies, groundwater and surface water.                                                                                               | Spill or leaks of fuel, chemicals and lubricants<br>Electrical fault or faulty equipment<br>Extreme weather (rain, wind)<br>Employee negligence<br>Presence of Asbestos in existing facilities during demolition<br>Release of chemicals from pipework or vessels during demolition<br>Release of contaminated soil from existing site. |
| C2      | Release of asbestos to the environment – waterbodies, groundwater, surface water, ground and air.                                                              | Presence of Asbestos in existing facilities during demolition, Asbestos Containing Materials (ACMs) present in made ground beneath the site and buried asbestos pipework beneath the site.                                                                                                                                              |
| C3      | Flooding of working areas causing silt run-off to nearby water courses.                                                                                        | Extreme weather (periods of heavy rainfall, taking into account climate change, strong winds) events                                                                                                                                                                                                                                    |
| C4      | Fire / Explosion with a secondary effect of fire suppressant water / foam / powder reaching nearby receptors (e.g. watercourse, groundwater, soil).            | Spill or leak of flammable or explosive substance<br>Construction vehicle or machinery collision<br>Electrical fault or faulty equipment                                                                                                                                                                                                |
| C5      | Incident at nearby COMAH or IE licenced site leading to fire/explosion or pollution of water courses and/or release of harmful substances into the atmosphere. | Equipment or power failure<br>Vehicle / plant machinery collision<br>Sabotage/arson leading to ignition of fuel and/or explosion                                                                                                                                                                                                        |
| C6      | Structural collapse and/or damage to existing structure/buildings                                                                                              | Faulty equipment<br>Vehicle collision / accidental damage to existing structures<br>Vibration from ground works / excavations                                                                                                                                                                                                           |
| C7      | Dust explosion                                                                                                                                                 | Release of dust during clean-out of existing plant equipment or from soil movement during site levelling                                                                                                                                                                                                                                |

The potential risks identified in Table 16.6 have been assessed and the resulting risk analysis is presented in Table 16.7.

The risk register is based upon possible risks associated with the construction and demolition phase of the Proposed Development.

The consequence rating assigned to each potential risk assumes that the proposed mitigation measures and safety procedures have failed to prevent the effect on the environment.

**Table 16.7:** Risk Assessment – Demolition / Construction Phase

| Risk ID | Potential Risk                                                   | Possible Cause                                                                                                                                                                                                                                                         | Environmental Effect                                                                                                                                                                                               | Likelihood Rating (1-5) | Basis of Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Conseq. Rating (1-5) | Basis of Consequence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Risk Score (Consequence x Likelihood) |
|---------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| C1      | Contamination of the waterbodies, groundwater and surface water. | Spill or leaks of fuel, chemicals and lubricants<br>Electrical fault or faulty equipment<br>Extreme weather (rain, wind)<br>Employee negligence<br>Release of chemicals from pipework or vessels during demolition<br>Release of contaminated soil from existing site. | Contamination of water bodies<br>Damage to depletion of habitats and species<br>Contamination of groundwater and/or surface water<br>Contamination of soils, which would have to be remediated or removed as waste | 2                       | <p>Mitigation measures to prevent contamination of waterbodies, groundwater and surface water are described in Draft CEMP (PM Group Report Ref. No. IE0313391-22-RP-0004), and are detailed in <i>Chapter 7 Soils, Geology and Hydrogeology</i> and <i>Chapter 11 Air Quality</i> of this EIAR. The mitigation measures include:</p> <p>Set back distances from rivers and stream by at least 7m.</p> <p>Protection and maintenance of set back area vegetation.</p> <p>Construction of earth bund between the construction site and set back zone.</p> <p>Temporary silt fences/covers between the construction site and any on-site water course for the duration of the construction works.</p> <p>Prior to commencing decommissioning and demolition works the existing site drainage network, including sumps and interceptors, shall be cleaned and inspected. Temporary drainage shall be installed to capture and control the run-off arising from the demolition works (road washing, dust control run-off, pipe-line cleaning etc) in order to prevent contamination or deleterious materials entering water courses or the SAC/SPA.</p> <p>As outlined in CEMP, all paved areas shall be kept clear of earth material and debris. The site shall be maintained to prevent sediment laden run-off from migrating of site and into the storm drainage system.</p> <p>All existing clean soil from excavations, clean crushed concrete, and other stockpiles will be positioned at a suitable distance from water courses and drainage systems.</p> <p>If offsite disposal of concrete wash water is required, the contractor must make provision for removal and disposal of any concrete wash water, by means of transfer off-site by an approved waste contractor. Where required, the pouring of concrete must take place using a geosynthetic material to prevent concrete runoff into the soil/groundwater media.</p> <p>All fuel, chemicals and lubricants will be stored on hard standing in the staging area that will be protected with designated drainage and equipped with a class 1 interceptor of suitable size.</p> <p>No bulk chemicals or oil and fuel storage are to be stored in the construction area.</p> <p>All refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in the designated part of the staging area.</p> | 4                    | <p>Inadvertent spillages or releases of hydrocarbons and/or other chemical substances or asbestos during the construction phase could introduce chemicals or hydrocarbons to the nearby surface water features (River Boyne / Estuary and the Irish Sea). These have high sensitivity as they are classified as SACs and/or SPAs.</p> <p>The potential effects of the construction phase of the Proposed Development are likely to be short-term, negative and significant, (in accordance with the EPA (2022) Impact Assessment Criteria set out in Table 1.5 of this EIAR). This is rated as "very serious" i.e. heavy contamination per Table 16.2.</p> | 8                                     |



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| Risk ID | Potential Risk | Possible Cause | Environmental Effect | Likelihood Rating (1-5) | Basis of Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Conseq. Rating (1-5) | Basis of Consequence | Risk Score (Consequence x Likelihood) |
|---------|----------------|----------------|----------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------|---------------------------------------|
|         |                |                |                      |                         | <p>Spill kits will be made available to all machinery and in designated areas at all times. Spill kits will be kept in all machines on the site and a large spill kit shall be made available in the site stores.</p> <p>Any hazardous waste residuals or potentially contaminated sludge from spill clean-up must be stored within appropriate metal or plastic containers in temporary bunded storage areas in the construction compounds prior to removal by an approved permitted/licensed waste management contractor for off-site treatment/recycling/disposal.</p> <p>IPC Guidance Note on the Storage and Transfer of Materials for Scheduled Activities (EPA 2004) shall be complied with.</p> <p>Divert uncontaminated stormwater away from the work area and into the stormwater system using flow diversion strategies and devices.</p> <p>Protect sand and soil stockpiles and other materials that may erode with waterproof coverings.<br/>Ensure waste is contained in covered bins or traps made from geotextile.<br/>Ensure building materials are stored away from drainage paths and up-slope of sediment barriers.</p> <p>Install interceptors and silt fences to prevent silt from entering stormwater drains or surface water bodies.</p> <p>During demolition existing stormwater drains will be retained, with surface water diverted to stormwater retention basins for settlement and monitoring.</p> <p>In the event that further ground contamination is encountered beneath the site during the enabling, demolition or construction works, excavation / ground works in the area of identified contamination will cease. Advice will be sought from an experienced contaminated land specialist and a phased environmental risk assessment (specifically to assess any associated potential environmental and/ or human health risks) will be undertaken in accordance with relevant EPA guidance 'Guidance On The Management Of Contaminated Land And Groundwater At EPA Licensed Sites' (EPA, 2013) and UK Environment Agency Guidance 'Land contamination risk management (LCRM)' (UK EA, 2023). An updated GQRA will be prepared by an experienced contaminated land specialist based on the findings of the risk assessment.</p> <p>Any chemicals including sealed chemicals previously used on site will be returned to the suppliers if possible, otherwise disposed of as waste.<br/>Where possible material remaining onsite such as diesel will be used during the work phase.</p> <p>Clean to Shell will be carried out under a permitting</p> |                      |                      |                                       |

| Risk ID | Potential Risk                                                                                    | Possible Cause                                                                                                                                             | Environmental Effect                                                                                                                                                                                                                                  | Likelihood Rating (1-5) | Basis of Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Conseq. Rating (1-5) | Basis of Consequence                                                                                                                                               | Risk Score (Consequence x Likelihood) |
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|         |                                                                                                   |                                                                                                                                                            |                                                                                                                                                                                                                                                       |                         | system, which will include SPAs and/or Risk Assessment and Method Statements, to ensure clean out occurs in a controlled manner.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                                                                                                                                                                    |                                       |
| C2      | Release of asbestos to the environment – waterbodies, groundwater, surface water, ground and air. | Presence of Asbestos in existing facilities during demolition, ACMs present in made ground beneath the site and buried asbestos pipework beneath the site. | Contamination of water bodies<br>Damage to depletion of habitats and species<br>Contamination of groundwater and/or surface water<br>Contamination of soils, which would have to be remediated or removed as waste<br>Exposure to asbestos particles. | 2                       | <p>A refurbishment/demolition asbestos survey (RDAS) has been carried out for every structure to be demolished, which clearly identifies structures that contain asbestos materials.</p> <p>All asbestos will be removed by competent contractors prior to demolition. Asbestos-containing products will be removed in accordance with The Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations, 2006 &amp; 2010 and all amendments thereto. Any high-risk asbestos removal will be completed by the competent contractor under their task specific Asbestos Plan of Work.</p> <p>Separate Plan of Works will be produced by the specialist contractors and Asbestos Notification Form submitted to the HSA.</p> <p>All operatives carrying out works will require to be fully specialised Asbestos trained personnel for Licensed work and trained to at least Lower Risk Asbestos Removal Standard. All training must be ARCA (Asbestos Removal Contractors Association) approved.</p> <p>Control access to the building will be in place to essential personnel only.</p> <p>Warning signs will be placed at the entry and exit points.</p> <p>Asbestos to be removed will be identified and then removed as per Plan of Works.</p> <p>Some areas will require full asbestos enclosures built with air and bag locks, and under the correct negative pressure as per regulations. All enclosures will be smoke tested before use.</p> <p>Handheld spray will be used (wetting and surfactant agent) to dampen the area down as asbestos removed.</p> <p>Injection systems may be required on areas of lagging.</p> <p>Asbestos waste will be double bagged or sealed in 1000-gauge sheeting.</p> <p>Strict control of asbestos transit routes will be put in place.</p> <p>Asbestos waste will be placed into secure lockable asbestos skips and located nearby the asbestos removal activity to minimise transit of materials. Disposal of material will be to an approved waste</p> | 4                    | A release of asbestos would lead to a significant number of people in the affected areas impacted with multiple fatalities (5 to 5) and up to 100 serious injuries | 8                                     |

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| Risk ID | Potential Risk                                                          | Possible Cause                                                                                       | Environmental Effect                                                                                                                                       | Likelihood Rating (1-5) | Basis of Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Conseq. Rating (1-5) | Basis of Consequence                                                                                                                                                                                                                                                                                                                    | Risk Score (Consequence x Likelihood) |
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|         |                                                                         |                                                                                                      |                                                                                                                                                            |                         | <p>disposal facility transported using ADR regulations (European Communities (Carriage of Dangerous Goods by Road and Use of Transportable Pressure Equipment) Regulations, 2011 (S.I. No. 349 of 2011), as amended.</p> <p>Independent Asbestos analysts will certify areas when asbestos removal is finished and provide clearance certifications for reoccupation and use.</p> <p>All asbestos waste removed will be recorded.</p> <p>All remediation works will be supervised by an appropriately qualified Environmental Consultant and excavation works will be carried out carefully to ensure no potential for cross-contamination occur.</p> <p>All excavation works from Stockpile 1 and 2 will be supervised by an appropriately qualified Environmental Consultant with relevant contaminated land experience to allow visual screening of all material and segregation as required. A sampling programme will be implemented to verify that the excavated material is suitable for placement within the onsite landfill, and that all material deposited at the landfill, from Stockpile 1 and Stockpile 2 and any other onsite mounds, fully meets the relevant landfill licence criteria. The proposed testing suite shall include ACMs.</p> <p>A detailed Asbestos Management Plan (AMP) for any excavation works on the site will be developed by an asbestos consultant and all recommend mitigation measures will be incorporated in the final CEMP. All excavation operations shall be undertaken on the assumption that ACMs or asbestos pipework could be encountered and appropriate health and safety including appropriate Personal Protection Equipment (PPE) provided. All excavation operations in areas suspected to contain ACMs should be supervised by an asbestos consultant.</p> |                      |                                                                                                                                                                                                                                                                                                                                         |                                       |
| C3      | Flooding of working areas causing silt run-off to nearby water courses. | Extreme weather (periods of heavy rainfall, taking into account climate change, strong winds) events | Sedimentation of nearby watercourses<br>Damage to, or depletion of aquatic habitats and species<br>Destruction or damage to site services / infrastructure | 1                       | <p>AtkinsRéalis has completed a Stage 1 Flood Risk Assessment (FRA) for the Proposed Development site. The assessment concluded that “the proposed site is not at risk from flooding”. This conclusion of the FRA takes into consideration the following:</p> <ul style="list-style-type: none"> <li>No historic risk of flooding at the site.</li> <li>OPW CFRAM flood extent maps studies show no flood risk at the site. Site could be considered as located within Zone C, low probability of flooding.</li> <li>The existing wharf is located within Flood Zone B, however, the level of the existing wharf is higher than the flooding levels.</li> <li>The Proposed Development is not at risk of flooding from the 1% AEP event.</li> <li>Surface water runoff will be managed through the use of appropriate SuDS.</li> </ul> <p>Residual risks from more extreme events have been</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4                    | Flooding of the working area could result in high levels of silt and sediment entering the Boyne River water body would have a “very serious” consequence resulting in heavy contamination with widespread effects of extended duration. Excessive amounts of silt and suspended solids can cause fish kill and damage to the habitats. | 4                                     |

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| Risk ID | Potential Risk                                                                                                                                      | Possible Cause                                                                                                                           | Environmental Effect                                                                                                                                                                                                                                                                                                         | Likelihood Rating (1-5) | Basis of Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Conseq. Rating (1-5) | Basis of Consequence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Risk Score (Consequence x Likelihood) |
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|         |                                                                                                                                                     |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                              |                         | considered and it is concluded that these will not affect the site<br><br>During the construction phase the contractor will further develop the CEMP, an outline version of which is submitted with this planning application, but it is to be updated prior to construction by the Principal Contractor which ensures that control measures for all extreme weather events will be included in the Plan and associated Method Statements.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                       |
| C4      | Fire / Explosion with a secondary effect of fire suppressant water / foam / powder reaching nearby receptors (e.g. watercourse, groundwater, soil). | Spill or leak of flammable or explosive substance<br>Construction vehicle or machinery collision<br>Electrical fault or faulty equipment | Damage to, or depletion of habitats and species (incl. aquatic habitats and species);<br>Contamination of groundwater resources;<br>Contamination of soils, which would have to be remediated or removed as waste<br>Injury /illness/loss of life<br>Generation of waste, as damaged equipment would have to be disposed of. | 2                       | A fire and/or explosion during the construction phase is considered "very unlikely" as the quantities of flammable or explosive materials required, which could ignite or spill, will be minimal and will be confined to the construction compound.<br><br>In any areas with electrical equipment, or hydrocarbons, water will not be used for firefighting. As part of the CEMP the contractor will ensure that all relevant fire safety requirements are in place prior to commencement of works.<br><br>All fuel, chemicals and lubricants will be stored on hard standing in the staging area that will be protected with designated drainage and equipped with a class 1 interceptor of suitable size.<br>No bulk chemicals or oil and fuel storage are to be stored in the construction area.<br><br>All refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in the designated part of the staging area.<br><br>Spill kits will be made available to all machinery and in designated areas at all times. Spill kits will be kept in all machines on the site and a large spill kit shall be made available in the site stores.<br><br>Any hazardous waste residuals or potentially contaminated sludge from spill clean-up must be stored within appropriate metal or plastic containers in temporary bunded storage areas in the construction compounds prior to removal by an approved permitted/licensed waste management contractor for off-site treatment/recycling/disposal.<br><br>IPC Guidance Note on the Storage and Transfer of Materials for Scheduled Activities (EPA 2004) shall be complied with.<br><br>All pipework etc. will be cleaned by licenced contractors.<br>Any hazardous steel structures such as oil or chemical tanks will be cleaned and gas-freed prior to demolition. | 4                    | Should a fire and/or explosion occur, the consequence could be "very serious" potentially resulting in fatalities, serious injuries and heavy contamination.<br><br>Should contamination of soil occur, the contamination would be localised but of extended duration.<br><br>Release of fire water / suppressant to the nearby surface water features (River Boyne / Estuary and the Irish Sea). These have high sensitivity as they are classified as SACs and/or SPAs.<br><br>The potential effects of are likely to be short-term, negative and significant, (in accordance with the EPA (2022) Impact Assessment Criteria set out in Table 1.5 of this EIA). This is rated as "very serious" i.e. heavy contamination. | 8                                     |
| C5      | Incident at nearby COMAH or IE licenced site leading to                                                                                             | Equipment or power failure<br>Vehicle / plant machinery collision<br>Sabotage/arson leading to                                           | Injury or loss of life<br>Destruction of property and/or infrastructure<br>Damage to terrestrial /                                                                                                                                                                                                                           | 1                       | COMAH and IE Licenced sites are regularly inspected with operators required to prepare and submit site-specific Major Accident Prevention Policy (MAPP) and Annual zEnvironmental Reports to the relevant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 4                    | According to the HSA website, "major industrial accidents involving dangerous substances pose a significant threat to humans and the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 4                                     |

| Risk ID | Potential Risk                                                                                         | Possible Cause                                                                                                                                                                                          | Environmental Effect                                                    | Likelihood Rating (1-5) | Basis of Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Conseq. Rating (1-5) | Basis of Consequence                                                                                                                                                                                                          | Risk Score (Consequence x Likelihood) |
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|         | fire/explosion or pollution of water courses and/or release of harmful substances into the atmosphere. | ignition of fuel and/or explosion                                                                                                                                                                       | aquatic life<br>Impact on air quality associated with emissions         |                         | regulatory/ enforcement agencies (i.e. the Health and Safety Authority and Environmental Protection Agency).<br><br>Given the stringent environmental and safety measures associated with such licenced sites and the distance between these sites and the Proposed Development, the likelihood of such an incident occurring during construction is considered 'extremely unlikely'.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                      | environment; such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident".<br>On this basis, the consequence is considered to be 'very serious'   |                                       |
| C6      | Structural collapse and/or damage to existing structure/buildings                                      | Faulty equipment<br>Vehicle collision / accidental damage to existing structures<br>Vibration from ground works / excavations                                                                           | Injury or loss of life<br>Destruction of property and/or infrastructure | 2                       | Method statements will be prepared for all construction activities and best practice construction measures will be implemented by the contractor during construction.<br><br>Demolition will be carried out by a competent demolition contractor under the Demolition Management Plan.<br><br>Prior to the commencement of works the contractor will prepare a Construction Traffic Management Plan which will designate traffic routes, timings and parking.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3                    | In the event of a structural collapse during the construction phase due to the number of workers on site at any given time, the consequence is considered to be 'serious' with a significant number of people being affected. | 6                                     |
| C7      | Dust explosion                                                                                         | Release of dust during clean-out of existing site equipment, or from soil movement during site levelling, leading to generation of flammable dust cloud. Subsequent ignition leading to dust explosion. | Injury or loss of life<br>Destruction of property and/or infrastructure | 2                       | A system will be enabled to ensure clean out occurs in a controlled manner. SPAs (Safe Plans of Action) and/or Risk and Method Statements will accompany permits, to show that every eventuality is considered when assessing an approach to clean-out.<br><br>ATEX procedures will be in place to ensure suppression of dust and removal of ignition sources while clean-out occurs.<br><br>Standard good practice construction measures, such as water spray, atomisers etc. will be implemented to minimise the generation of dust.<br><br>Works will only be carried out subject to an agreed and approved method statement;<br><br>Water Cannons and dust buster units will be used during demolition activities;<br><br>All structures will undergo internal wash down prior to demolition;<br><br>Concrete crushing facilities will be setup at locations away from residential areas and strictly controlled with dampening down;<br><br>If cement is stored in a silo on site, a filter will be fitted to the silo; alternatively, ready-mix concrete will be supplied for just-in-time delivery.<br><br>Good housekeeping and site management will be observed including the proper storage of spoil / loose materials on site. | 4                    | Should an explosion occur, the consequence could be "very serious" potentially resulting in fatalities, serious injuries and heavy contamination.                                                                             | 8                                     |



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### 16.5.2 Operational Phase - Risk Assessment

Four potential risks specific to the operational phase of the Proposed Development have been identified. These are outlined in the operational phase risk register in Table 16.8.

**Table 16.8:** Risk Register – Operational Phase

| Risk ID | Potential Risk                                                                                                                                                 | Possible Cause                                                                                                                   |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Op1     | Contamination of the water courses – surface and ground water                                                                                                  | Equipment failure or power outage leading to uncontrolled discharge                                                              |
| Op2     | Fire / Explosion with a secondary effect of fire suppressant water / foam / powder reaching nearby receptors (e.g. watercourse, groundwater, soil).            | Electrical faults<br>Use of flammable / combustible materials<br>Fire in battery storage compound                                |
| Op3     | Incident at nearby COMAH or IE licenced site leading to fire/explosion or pollution of water courses and/or release of harmful substances into the atmosphere. | Equipment or power failure<br>Vehicle / plant machinery collision<br>Sabotage/arson leading to ignition of fuel and/or explosion |
| Op4     | Above ground gas pipelines onsite                                                                                                                              | Pipe rupture or leak                                                                                                             |

The potential risks identified in Table 16.8 have been assessed and the resulting risk analysis is presented in Table 16.9.

The risk register is based upon possible risks associated with the operational phase of the Proposed Development.

The consequence rating assigned to each potential risk assumes that the proposed mitigation measures and safety procedures have failed to prevent the effect on the environment.

**Table 16.9:** Risk Assessment - Operational Phase

| Risk ID | Potential Risk                                                | Possible Cause                                                      | Environmental Effect                                                                                                                                                                                                                                          | Likelihood Rating (1-5) | Basis of Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Conseq. Rating (1-5) | Basis of Consequence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Risk Score (Consequence x Likelihood) |
|---------|---------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Op1     | Contamination of the water courses – surface and ground water | Equipment failure or power outage leading to uncontrolled discharge | Contamination of water bodies<br>Damage to, or depletion of habitats and species (incl. aquatic habitats and species)<br>Contamination of groundwater and / or surface water<br>Contamination of soils, which would have to be remediated or removed as waste | 2                       | <p>No manufacturing facility at proposed plant, therefore there will be no process effluent.</p> <p>Treated spent seawater flows by gravity from the weir outfall at the site via the discharge pipeline, which runs parallel to the seawater supply pipeline as far as the pump station at Baltray Reservoir and then continues onwards to the outfall point in the Irish Sea. The outfall is Emission Point SW1 (E316884, N277175), and is licenced under the EPA Industrial Emissions Licence. The water discharged via SW1 is subject to a settlement treatment process, sampling and monitoring regime.</p> <p>All new sewers that will collect foul effluent from the various buildings as part of the Proposed Development will be designed in accordance with the latest Uisce Éireann Code of Practice and Standard Details.</p> <p>All surface water runoff from the site will be collected in the site's storm water system. Abstracted seawater from Baltray Reservoir will be used to reduce the pH of surface water runoff to comply with IEL limits, as required. This licensing arrangement with EPA will be updated as necessary and the project will comply in full with all requirements of the licensing regime in place. The surface water undergoes a settlement treatment process before being combined with seawater and is then discharged to sea via licenced emission point, SW1.</p> <p>There is 1 no. existing storm water discharge point to the Boyne River at the main entrance to the site. An attenuation/soakaway will be installed close to the location where the drainage leaves the site. The soakaway will be sized to accommodate a 100 year rainfall event including 20% climate change factor of safety, and store all the water, resulting in no discharge from the existing discharge point to the Boyne River for rainfall events less than 100 years. This water will discharge to groundwater by infiltration. An overflow will be connected to the existing outfall for cases where the inflow exceeds the 100 year rainfall events. The overflow will</p> | 4                    | <p>The nearby surface water features (River Boyne / Estuary and the Irish Sea). These have high sensitivity as they are classified as SACs and/or SPAs.</p> <p>The potential effects of the operational phase of the Proposed Development are likely to be short-term, negative and significant, (in accordance with the EPA (2022) Impact Assessment Criteria set out in Table 1.5 of this EIAR). This is rated as “very serious” i.e. heavy contamination, per Table 16.2.</p> <p>Should contamination of soil occur, the contamination would be localised but of extended duration.</p> | 8                                     |

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| Risk ID | Potential Risk                                                                                                                                      | Possible Cause                                                                                    | Environmental Effect                                                                                                                                                                                                                                                                                                                                                                                                              | Likelihood Rating (1-5) | Basis of Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Conseq. Rating (1-5) | Basis of Consequence                                                                                                                                                                                                                                                                 | Risk Score (Consequence x Likelihood) |
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|         |                                                                                                                                                     |                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                         | <p>be fitted with a bypass separator to filter out any hydrocarbons.</p> <p>The Site Environmental Management System (EMS) and Site Protection Management Plan (SPMP) under the site's IE licence will include site maintenance, which will involve infrastructure performance checks that will capture integrity loss in drainage systems and secondary forms of containment. If an effect is identified under the licence, remediation would be undertaken.</p> <p>The existing site emergency response procedure will be updated to include the Proposed Development.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                      |                                                                                                                                                                                                                                                                                      |                                       |
| Op2     | Fire / Explosion with a secondary effect of fire suppressant water / foam / powder reaching nearby receptors (e.g. watercourse, groundwater, soil). | Electrical faults<br>Use of flammable / combustible materials<br>Fire in battery storage compound | Damage to, or depletion of habitats and species (incl. aquatic habitats and species)<br>Contamination of groundwater resources<br>Effects on ambient air quality<br>Contamination of soils, which would have to be remediated or removed as waste<br>Injury/illness/loss of life<br>Generation of waste, as damaged equipment would have to be disposed of.<br>Generation of toxic substances from fire in battery storage system | 2                       | <p>No significant quantities of flammable material will be used or stored on the site.</p> <p>The occupied buildings will have the appropriate fire detection and abatement systems installed as per the relevant Fire and Building Regulations.</p> <p>BESS battery racks are monitored by a fire detection and suppression system. Cabinets will be UL1973 certified and compliant with NFPA855 and NFPA68.</p> <p>The BESS is external and will be provided with sealed concrete pavements with upstands to ensure that no contaminated runoff could discharge to, and potentially contaminate, surface water and/or groundwater. In the event of a fire at the BESS, firewater runoff will drain to the attenuation tank under the BESS. This retention tank will be fitted with a pH-controlled actuator on the outfall. Once contaminated water from a fire is detected, the outfall will close automatically turning it into a firewater run-off storage tank. A foul sewer will be installed under the DC and EC to collect potentially contaminated fire water runoff in the event of a fire. It is proposed to pump this water to the attenuation tank/contaminated water tank under the BESS. Contaminated firewater collected in the attenuation tank will be pumped out and removed off site in tankers.</p> | 4                    | <p>The consequences of a fire / explosion on site is considered to be 'very serious', resulting in fatalities and serious injuries.</p> <p>Additionally, the fire suppressant water/ foam/ powder entering Boyne River would result in heavy contamination of extended duration.</p> | 8                                     |
| Op3     | Incident at nearby COMAH or IE licenced site leading to fire/explosion or                                                                           | Equipment or power failure<br>Vehicle / plant machinery collision<br>Sabotage/arson               | Injury or loss of life<br>Destruction of property and/or infrastructure<br>Damage to terrestrial                                                                                                                                                                                                                                                                                                                                  | 1                       | COMAH and IE Licenced sites are regularly inspected with operators required to prepare and submit site-specific Major Accident Prevention Policy (MAPP) and Annual Environmental                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 4                    | According to the HSA website, "major industrial accidents involving dangerous substances pose a significant threat to humans and the environment; such accidents can give rise to serious injury                                                                                     | 4                                     |

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| Risk ID | Potential Risk                                                                       | Possible Cause                               | Environmental Effect                                                                                                                                                                                                                                                                                                                                                                   | Likelihood Rating (1-5) | Basis of Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Conseq. Rating (1-5) | Basis of Consequence                                                                                                                                                                                                                                                           | Risk Score (Consequence x Likelihood) |
|---------|--------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
|         | pollution of water courses and/or release of harmful substances into the atmosphere. | leading to ignition of fuel and/or explosion | / aquatic life<br>Impact on air quality associated with emissions                                                                                                                                                                                                                                                                                                                      |                         | <p>Reports to the relevant regulatory/enforcement agencies (i.e. the Health and Safety Authority and Environmental Protection Agency).</p> <p>There are no significant quantities of dangerous substances stored or used at the proposed development. Therefore, a major accident at Flogas would not result in a significant event at CORE.</p> <p>Given the stringent environmental and safety measures associated with such licenced sites and the distance between Flogas and the Proposed Development, the likelihood of such an incident occurring during the operational stage is considered 'extremely unlikely'.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                      | to people or serious damage to the environment, both on and off the site of the accident".<br>On this basis, the consequence is considered to be 'very serious'                                                                                                                |                                       |
| Op4     | Above ground gas pipelines onsite                                                    | Pipe rupture or leak                         | <p>Damage to, or depletion of habitats and species (incl. aquatic habitats and species)</p> <p>Contamination of groundwater resources</p> <p>Effects on ambient air quality</p> <p>Contamination of soils, which would have to be remediated or removed as waste</p> <p>Injury/illness/loss of life</p> <p>Generation of waste, as damaged equipment would have to be disposed of.</p> | 1                       | <p>The Proposed Development has been designed to reduce the potential for the formation and/ or ignition of explosive atmosphere through measures including hazardous area classification, electrically bonded equipment, Safety control and interlocks, overpressure protection where appropriate, design safety.</p> <p>Gas pipework from Existing Gas Skid to EC will be designed to the appropriate standards and code. The gas pipework will be primarily routed underground (approx. length of 300m), and protected. Overground gas pipework will be minimal (approx. 5m) and will be located at the EC.</p> <p>A foul sewer under the DC and EC will collect potentially contaminated fire water runoff. It is proposed to pump this water to the attenuation tank/contaminated water tank under the BESS which automatically shuts off the outfall during such an event to capture the contaminated water so that it may be pumped out and removed off site in tankers. The tank is fitted with a pH-controlled actuator on the outfall and in the event of detection of contaminated water from a fire, will close the tank turning it into a fire water runoff storage tank such that the water can be pumped out at a later stage and disposed of off-site.</p> <p>Failure rate of above ground natural gas pipework is estimated as <math>5 \times 10^{-6} \text{ yr}^{-1}</math>, or once in every 200,000 years. This is within the range of 'extremely unlikely'.</p> | 4                    | <p>The consequences of a fire / explosion on site are considered to be 'very serious', resulting in fatalities and serious injuries. Additionally, the fire suppressant water/ foam/ powder entering Boyne River would result in heavy contamination of extended duration.</p> | 4                                     |

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### 16.5.3 Risk Scores and Risk Matrix

The risk assessment in Table 16.10 categorises each of the potential risks by their 'risk score'.

**Table 16.10:** Risk Scores

| Risk ID | Potential Risk                                                                                                                                                 | Likelihood Rating (1-5) | Consequence Rating (1-5) | Risk Score (Consequence x Likelihood) |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------------|---------------------------------------|
| C1      | Contamination of the waterbodies, groundwater and surface water.                                                                                               | 2                       | 4                        | 8                                     |
| C2      | Release of asbestos to the environment – waterbodies, groundwater, surface water, ground and air.                                                              | 2                       | 4                        | 8                                     |
| C3      | Flooding of working areas causing silt run-off to nearby water courses.                                                                                        | 1                       | 4                        | 4                                     |
| C4      | Fire / Explosion with a secondary effect of fire suppressant water / foam / powder reaching nearby receptors (e.g. watercourse, groundwater, soil).            | 2                       | 4                        | 8                                     |
| C5      | Incident at nearby COMAH or IE licenced site leading to fire/explosion or pollution of water courses and/or release of harmful substances into the atmosphere. | 1                       | 4                        | 4                                     |
| C6      | Structural collapse and/or damage to existing structure/buildings                                                                                              | 2                       | 3                        | 6                                     |
| C7      | Dust explosion                                                                                                                                                 | 2                       | 4                        | 8                                     |
| Op1     | Contamination of the water courses – surface and ground water                                                                                                  | 2                       | 4                        | 8                                     |
| Op2     | Fire / Explosion with a secondary effect of fire suppressant water / foam / powder reaching nearby receptors (e.g. watercourse, groundwater, soil).            | 2                       | 4                        | 8                                     |
| Op3     | Incident at nearby COMAH or IE licenced site leading to fire/explosion or pollution of water courses and/or release of harmful substances into the atmosphere. | 1                       | 4                        | 4                                     |
| Op4     | Above ground gas pipelines onsite                                                                                                                              | 1                       | 4                        | 4                                     |

A corresponding risk matrix is provided in Table 16.11 which is colour coded to provide an indication of the critical nature of each task. The red zone represents high risks, the amber zone represents medium risks and the green zone represents low risks.

As is evident in Table 16.11, all the potential risks identified during the construction and operational phases of the Proposed Development can be classified as low to medium risk.



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**Table 16.11: Risk Matrix**

|                           |                           |          |              |                |                |                             |                     |
|---------------------------|---------------------------|----------|--------------|----------------|----------------|-----------------------------|---------------------|
| <b>Likelihood Rating</b>  | <b>Very likely</b>        | <b>5</b> |              |                |                |                             |                     |
|                           | <b>Likely</b>             | <b>4</b> |              |                |                |                             |                     |
|                           | <b>Unlikely</b>           | <b>3</b> |              |                |                |                             |                     |
|                           | <b>Very unlikely</b>      | <b>2</b> |              |                |                | C1, C2, C4, C7<br>Op1, Op2, |                     |
|                           | <b>Extremely unlikely</b> | <b>1</b> |              |                |                | C3, C5<br>Op3, Op4          |                     |
|                           |                           |          | <b>Minor</b> | <b>Limited</b> | <b>Serious</b> | <b>Very Serious</b>         | <b>Catastrophic</b> |
|                           |                           |          | <b>1</b>     | <b>2</b>       | <b>3</b>       | <b>4</b>                    | <b>5</b>            |
| <b>Consequence Rating</b> |                           |          |              |                |                |                             |                     |

#### 16.5.4 Conclusion with Respect to Major Accidents and Disasters

No plausible major accidents or disaster hazards were identified, to which the Proposed Development will be particularly vulnerable. All potential risks identified were determined to be low to medium risk scenarios. No plausible potential risks were identified which would result in the Proposed Development causing a major accident or disaster on or outside of the Proposed Development.

#### 16.6 Potential Cumulative Effects

Cumulative effects may result by the addition of many minor or insignificant effects from the Proposed Development and other relevant projects to create larger, more significant effects. Relevant planned or permitted developments within the vicinity and context of the Proposed Development are outlined in Section 2.10 in *Chapter 2 Description of Proposed Development* of this EIAR and include:

- **Large Scale Residential Development (LRD) (LCC Planning Ref.: 2360053)**

An application was registered with Louth County Council for a Large-Scale Residential Development that includes 192 no. residential units, to the west of the subject site on lands at Boyne Road, Drogheda, Co. Louth, on the 31st of March 2023. A final grant of permission was issued, following receipt of further information by the Planning Authority, on the 14th of December 2023.

The Proposed Development to which this planning application relates has taken this LRD into account in its design in terms of mitigating against potential effects, which is discussed further in the various chapters of this EIAR.

- **Reg. Ref.: 2360137 – Self Storage Facility (LCC Planning Ref.: 2360137)**

A final grant of permission was issued by Louth County Council on the 23rd of October 2023 for development on a site directly to the north of the subject site. The development applied for was described as follows:

“Permission for the construction of a self-storage facility comprising approximately 2588sqm gross floor area, in 4 blocks, with individual units ranging in size from 12sqm to 30sqm, a single storey office/service building, signage, car parking spaces and all associated site development works.”

- **Drogheda Port Company – Tom Roe’s Point Facility**

Detailed consultation has taken place between PPL and the Port on its future plans. PPL and the Port will collaborate across multiple workstreams including the PANCR Road development, and increased business for the Port from the new enterprises operating from the PPL CORE Campus.

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– **Flogas LPG Terminal**

The Flogas LPG Terminal is located ca. 400m south west of the PPL site on the opposite side of the Boyne River. The design and positioning of the PPL buildings as part of the Proposed Development have been selected on the campus to avoid any cumulative effects with the existing Flogas COMAH site.

- A section of the proposed development is located within the consultation distance for Flogas, and has been identified as being within the Outer Land Use Planning Zone for Flogas. There are no significant quantities of dangerous substances stored at the proposed development. Therefore, a major accident at Flogas would not increase the possibility of a major accident at CORE.

#### 16.6.1 Summary of Potential Cumulative Effects

The potential cumulative impacts associated with the development of the proposed site was considered and no significant impacts were considered likely.

Cumulative impacts related to major accidents, as described in this chapter, are not expected.

#### 16.6.2 Potential Future Phases of CORE

As described in Section 2.11 of this EIAR, the Proposed Development to which this planning application relates is the first stage of CORE. Given the level of detail available on possible future phases of CORE, it is not possible to carry out a detailed cumulative assessment of potential effects due to Major Accidents and Disasters for the construction and operational phases with the future phases at this time.

Potential future phases of development will be subject to separate planning applications and Environmental Impact Assessment Report (EIAR), and Industrial Emissions Licensing by the EPA, as required. Future phases of the development may require additional mitigation measures to ensure the proper management of effects due to Major Accidents and Disasters. These measures will be identified and detailed as part of the detailed design and EIAR for any additional phases of the development to ensure the potential future phases do not have any significant adverse effect on the environment.

Furthermore, any subsequent EIAR's for a future phase of development will cumulatively assess any existing phases at that time.

### 16.7 Mitigation Measures

#### 16.7.1 Construction Phase (including Demolition)

As outlined in Section 16.5, the scenarios with the highest risk score related to

- C1 contamination of water bodies
- C2 release of asbestos to the environment
- C4 fire and explosion
- C7 Dust Explosion

Mitigation measures in place against these scenarios are outlined below.

##### **Mitigation against Contamination of Water Bodies (C1)**

Mitigation measures to prevent contamination of waterbodies, groundwater and surface water are described in Draft CEMP (PM Group Report Ref. No. IE0313391-22-RP-0004), and are detailed in *Chapter 7 Soils, Geology and Hydrogeology* and *Chapter 11 Air Quality* of this EIAR. The mitigation measures include:

- Set back distances from rivers and stream by at least 7m, protection and maintenance of set back area vegetation and construction of earth bund between the construction site and set back zone.

- Temporary silt fences/covers between the construction site and any on-site water course for the duration of the construction works.
- Prior to commencing decommissioning and demolition works the existing site drainage network, including sumps and interceptors, shall be cleaned and inspected. Temporary drainage shall be installed to capture and control the run-off arising from the demolition works (road washing, dust control run-off, pipe-line cleaning etc) in order to prevent contamination or deleterious materials entering water courses or the SAC/SPA.
- As outlined in CEMP, all paved areas shall be kept clear of earth material and debris. The site shall be maintained to prevent sediment laden run-off from migrating of site and into the storm drainage system.
- All existing clean soil from excavations, clean crushed concrete, and other stockpiles will be positioned at a suitable distance from water courses and drainage systems.
- If offsite disposal of concrete wash water is required, the contractor must make provision for removal and disposal of any concrete wash water, by means of transfer off-site by an approved waste contractor.
- Where required, the pouring of concrete must take place using a geosynthetic material to prevent concrete runoff into the soil/groundwater media.
- All fuel, chemicals and lubricants will be stored on hard standing in the staging area that will be protected with designated drainage and equipped with a class 1 interceptor of suitable size.
- No bulk chemicals or oil and fuel storage are to be stored in the construction area.
- All refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in the designated part of the staging area.
- Spill kits will be made available to all machinery and in designated areas at all times. Spill kits will be kept in all machines on the site and a large spill kit shall be made available in the site stores.
- Any hazardous waste residuals or potentially contaminated sludge from spill clean-up must be stored within appropriate metal or plastic containers in temporary bunded storage areas in the construction compounds prior to removal by an approved permitted/licensed waste management contractor for off-site treatment/recycling/disposal.
- IPC Guidance Note on the Storage and Transfer of Materials for Scheduled Activities (EPA 2004) shall be complied with.
- Divert uncontaminated stormwater away from the work area and into the stormwater system using flow diversion strategies and devices.
- Protect sand and soil stockpiles and other materials that may erode with waterproof coverings.
- Ensure waste is contained in covered bins or traps made from geotextile.
- Ensure building materials are stored away from drainage paths and up-slope of sediment barriers
- Install interceptors and silt fences to prevent silt from entering stormwater drains or surface water bodies.
- During demolition existing stormwater drains will be retained, with surface water diverted to stormwater retention basins for settlement and monitoring.
- In the event that further ground contamination is encountered beneath the site during the enabling, demolition or construction works, excavation / ground works in the area of identified contamination will cease. Advice will be sought from an experienced contaminated land specialist and a phased environmental risk assessment (specifically to assess any associated potential environmental and/ or human health risks) will be undertaken in accordance with relevant EPA guidance 'Guidance On The Management Of Contaminated Land And Groundwater At EPA Licensed Sites' (EPA, 2013) and UK Environment Agency Guidance 'Land contamination risk management (LCRM)' (UK EA, 2023). An updated GQRA will be

- prepared by an experienced contaminated land specialist based on the findings of the risk assessment.
- Any chemicals including sealed chemicals previously used on site will be returned to the suppliers if possible, otherwise disposed of as waste.
  - Where possible material remaining onsite such as diesel will be used during the work phase.
  - Clean to Shell will be carried out under a permitting system, which will include SPAs and/or Risk Assessment and Method Statements, to ensure clean out occurs in a controlled manner.

**Mitigation against Release of Asbestos to the Environment (C2)**

- A refurbishment/demolition asbestos survey (RDAS) has been carried out for every structure to be demolished, which clearly identifies structures that contain asbestos materials.
- All asbestos will be removed by competent contractors prior to demolition. Asbestos-containing products will be removed in accordance with The Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations, 2006 & 2010 and all amendments thereto. Any high-risk asbestos removal will be completed by the competent contractor under their task specific Asbestos Plan of Work.
- Separate Plan of Works will be produced by the specialist contractors and Asbestos Notification Form submitted to the HSA.
- All operatives carrying out works will require to be fully specialised Asbestos trained personnel for Licensed work and trained to at least Lower Risk Asbestos Removal Standard. All training must be ARCA (Asbestos Removal Contractors Association) approved.
- Control access to the building will be in place to essential personnel only.
- Asbestos to be removed will be identified and then removed as per Plan of Works.
- Some areas will require full asbestos enclosures built with air and bag locks, and under the correct negative pressure as per regulations. All enclosures will be smoke tested before use.
- Handheld spray will be used (wetting and surfactant agent) to dampen the area down as asbestos removed.
- Injection systems may be required on areas of lagging.
- Asbestos waste will be double bagged or sealed in 1000-gauge sheeting.
- Strict control of asbestos transit routes will be put in place.
- Asbestos waste will be placed into secure lockable asbestos skips and located nearby the asbestos removal activity to minimise transit of materials. Disposal of material will be to an approved waste disposal facility transported using ADR regulations (European Communities (Carriage of Dangerous Goods by Road and Use of Transportable Pressure Equipment) Regulations, 2011 (S.I. No. 349 of 2011), as amended
- Independent Asbestos analysts will certify areas when asbestos removal is finished and provide clearance certifications for reoccupation and use.
- All asbestos waste removed will be recorded.
- All remediation works will be supervised by an appropriately qualified Environmental Consultant and excavation works will be carried out carefully to ensure no potential for cross-contamination occur.
- All excavation works from Stockpiles 1 and 2 will be supervised by an appropriately qualified Environmental Consultant with relevant contaminated land experience to allow visual screening of all material and segregation as required. A sampling programme will be implemented to verify that the excavated material is suitable for placement within the onsite landfill, and that all material deposited at the landfill, from Stockpile 1 and Stockpile 2 and any other onsite mounds, fully meets the relevant landfill licence criteria. The proposed testing suite shall include ACMs.

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- A detailed Asbestos Management Plan (AMP) for any excavation works on the site will be developed by an asbestos consultant and all recommend mitigation measures will be incorporated in the final CEMP.
- All excavation operations shall be undertaken on the assumption that ACMs or asbestos pipework could be encountered and appropriate health and safety including appropriate Personal Protection Equipment (PPE) provided. All excavation operations in areas suspected to contain ACMs should be supervised by an asbestos consultant.

**Mitigation against Fire and Explosion (C4)**

- During the demolition and construction phase, the quantities of flammable or explosive materials required, which could ignite or spill, will be minimal and will be confined to the construction compound.
- In any areas with electrical equipment, or hydrocarbons, water will not be used for firefighting. As part of the CEMP the contractor will ensure that all relevant fire safety requirements are in place prior to commencement of works.
- All fuel, chemicals and lubricants will be stored on hard standing in the staging area that will be protected with designated drainage and equipped with a class 1 interceptor of suitable size.
- No bulk chemicals or oil to be stored in the construction area, and limited fuel storage are to facilitate refuelling.
- All refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in the designated part of the staging area.
- Spill kits will be made available to all machinery and kept in designated areas at all times. Spill kits will be kept in all machines on the site and a large spill kit will be made available in the site stores.
- Any hazardous waste residuals or potentially contaminated sludge from spill clean-up must be stored within appropriate metal or plastic containers in temporary bunded storage areas in the construction compounds prior to removal by an approved permitted/licensed waste management contractor for off-site treatment/recycling/disposal at a permitted or licenced facility.
- IPC Guidance Note on the Storage and Transfer of Materials for Scheduled Activities (EPA 2004) shall be complied with.

**Mitigation against Dust Explosion (C7)**

- A system will be enabled to ensure clean out occurs in a controlled manner. SPAs (Safe Plans of Action) and/or Risk and Method Statements will accompany permits, to show that every eventuality is considered when assessing an approach to clean-out.
- ATEX procedures will be in place to ensure suppression of dust and removal of ignition sources while clean-out occurs.
- Standard good practice construction measures, such as water spray, atomisers etc. will be implemented to minimise the generation of dust.
- Works will only be carried out subject to an agreed and approved method statement.
- Water Cannons and dust buster units will be used during demolition activities.
- All structures will undergo internal wash down prior to demolition;
- Concrete crushing facilities will be setup at locations away from residential areas and strictly controlled with dampening down;
- If cement is stored in a silo on site, a filter will be fitted to the silo; alternatively, ready-mix concrete will be supplied for just-in-time delivery
- Good housekeeping and site management will be observed including the proper storage of spoil / loose materials on site;



Mitigation measures against the remaining major accidents are detailed in the risk assessment in Table 16.7. See also *Chapter 18 Summary of Mitigation Measures* of this EIAR for a summary of mitigation measures to be implemented during the demolition and construction phase of this development.

## 16.7.2 Operational Phase

As outlined in Section 16.5.6, the scenarios with the highest risk score related to:

- Op1 Contamination of water bodies,
- Op2 Fire / Explosion

The mitigation measures against these scenarios are outlined below.

### Mitigation against Contamination of Water Bodies (Op1)

- No manufacturing facility at proposed plant, therefore there will be no process effluent.
- Treated spent seawater flows by gravity from the weir outfall at the site via the discharge pipeline, which runs parallel to the seawater supply pipeline as far as the pump station at Baltray Reservoir and then continues onwards to the outfall point in the Irish Sea. The outfall is Emission Point SW1 and is licenced under the EPA Industrial Emissions Licence. The water discharged via SW1 is subject to a settlement treatment process, sampling and monitoring regime.
- All new sewers that will collect foul effluent from the various buildings as part of the Proposed Development will be designed in accordance with the latest Uisce Éireann Code of Practice and Standard Details.
- All surface water runoff from the site will be collected in the site's storm water system. Abstracted seawater from Baltray Reservoir will be used to reduce the pH of surface water runoff to comply with IEL limits, as required. This licensing arrangement with EPA will be updated as necessary and the project will comply in full with all requirements of the licensing regime in place. The surface water undergoes a settlement treatment process before being combined with seawater and is then discharged to sea via licenced emission point, SW1.
- There is 1 no. existing storm water discharge point to the Boyne River at the main entrance to the site. An attenuation/soakaway will be installed close to the location where the drainage leaves the site. The soakaway will be sized to accommodate a 100 year rainfall event including a 20% climate change factor of safety, and store all the water, resulting in no discharge from the existing discharge point to the Boyne River for rainfall events less than 100 years. This water will discharge to groundwater by infiltration. An overflow will be connected to the existing outfall for cases where the inflow exceeds the 100 year rainfall events. The overflow will be fitted with a bypass separator to filter out any hydrocarbons.
- The Site Environmental Management System (EMS) and Site Protection Management Plan (SPMP) under the site's IE will include site maintenance, which will involve infrastructure performance checks that will capture integrity loss in drainage systems and secondary forms of containment. If an effect is identified under the licence, remediation would be undertaken.
- The existing site emergency response procedure will be updated to include the Proposed Development. Trained emergency response and spill response teams are in place at the site.

### Mitigation against Fire and Explosion (Op2)

- No significant quantities of flammable material will be used or stored on the site.
- The occupied buildings will have the appropriate fire detection and abatement systems installed as per the relevant Building Regulations.
- BESS battery racks are monitored by a fire detection and suppression system. Cabinets will be UL1973 certified and compliant with NFPA855 and NFPA68.
- The BESS is external and will be provided with sealed concrete pavements with upstands to ensure that no contaminated runoff could discharge to, and potentially contaminate, surface

water and/or groundwater. In the event of a fire at the BESS, firewater runoff will drain to the attenuation tank under the BESS. This retention tank will be fitted with a pH-controlled actuator on the outfall. Once contaminated water from a fire is detected, the outfall will close automatically turning it into a firewater run-off storage tank. A foul sewer will be installed under the DC and EC to collect potentially contaminated fire water runoff in the event of a fire. It is proposed to pump this water to the attenuation tank/contaminated water tank under the BESS. Contaminated firewater collected in the attenuation tank will be pumped out and removed off site in tankers.

Mitigation measures against the remaining major accidents are detailed in the risk assessment in Table 16.9. See Also *Chapter 18 Summary of Mitigation Measures* of this EIAR for a summary of mitigation measures to be implemented during the operational phase of this development.

### 16.7.3 Monitoring during Construction Phase (Including Demolition)

The monitoring measures to be carried out by the contractor during construction are detailed in the outline Construction and Environmental Management Plan (PM Group document reference no. IE0313391-22-RP-0003, Issue A). The monitoring relevant to the risks identified in this chapter are summarised in Table 16.12.

**Table 16.12:** Monitoring Measures during Demolition and Construction

| Key Aspect                                 | Objective, target                                                                                                                              | How is it measured?                                                                                                                                                          |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Surface water, groundwater and soil</b> | Protect surface water, groundwater and soil resources onsite                                                                                   | Site monitoring by Project Supervisor Construction Stage (PSCS) (ongoing basis).<br>Environmental audits of site.<br>Monitoring of discharge water at SW1                    |
| <b>Waste</b>                               | Ensure that best waste management practices on site are fully implemented to comply with national, regional and local regulatory requirements. | Site monitoring by PSCS (ongoing basis).<br>Environmental audits of site.<br>Audit of waste management contractor facilities.                                                |
| <b>Biodiversity</b>                        | Ensure biodiversity, habitat is not degraded during the construction works.                                                                    | Environmental auditing and site monitoring                                                                                                                                   |
| <b>Air</b>                                 | Ensure that humans are not negatively impacted by dust generated by demolition or construction works                                           | Site audits and monitoring of works. Should dust levels become high, increase mitigation measures. Should vehicles be defective, get a repair complete or removed from site. |
| <b>Traffic</b>                             | Ensure the local population are not affected by traffic from the project construction works                                                    | Monitored throughout the project by the PSCS, Environmental Officer and the client and site feedback                                                                         |

### 16.7.4 Monitoring during Operational Phase

As described in previous sections, the proposed site will operate under an IE Licence. This licence will detail significant monitoring measures. It is assumed that no additional monitoring will be necessary during the operational phase of the Proposed Development.

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## 16.8 Do-Nothing Scenario

Under the "Do Nothing" scenario, where the proposed redevelopment does not proceed, PPL is likely to resume full scale production, supported by stabilised fuel prices and increased demand for Magnesia products. Existing credible major accidents and disasters, associated with the PPL site operating at full scale production, would remain, although the likelihood of these events is very low.

## 16.9 Residual Effects

No plausible major accidents or disaster were identified, to which the Proposed Development will be particularly vulnerable during the construction or operation phase. No plausible potential risks were identified which would result in the Proposed Development causing a major accident or disaster on or outside the site during construction or operation.

## 16.10 Difficulties Encountered During Preparation of this Chapter

There were no difficulties encountered in compiling this chapter of the EIAR.

## 16.11 Chapter References

Department of the Environment, Heritage and Local Government (DoEHLG) (2010) *A Guide to Risk Assessment in Major Emergency Management*. Dublin Ireland.

European Commission (2012) *Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC*.

European Parliament (2014) *Directive 2014/52/EU of the European Parliament and the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment*

Environmental Protection Agency (EPA) (2022) *Guidelines on the Information to be contained in Environmental Impact Assessment Reports*.

Environmental Protection Agency (EPA) (2014) *Guidance on Assessing and Costing Environmental Liabilities*.

Government of Ireland (2019) *National Risk Assessment for Ireland Health and Safety Authorisation (2015) Control of Major Accident Hazards involving Dangerous Substances*

Premier Periclase Limited Industrial Emissions (IE) Licence P0376-02.

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## 17 Interactions and Cumulative Effects

### 17.1 Introduction

This Chapter has been prepared to describe the likely interactions between the various environmental effects predicted as a result of the Proposed Development, as well as the potential cumulative effects with other existing, planned and permitted projects, during the construction and operational phases at the Premier Periclase Ltd. (PPL) Site at Boyne Avenue, Newtownstalaban, Drogheda, Co. Louth.

In addition to the requirement under the Planning and Development Regulations 2001 (as amended) to describe the likely significant effects of the Proposed Development on particular aspects of the environment, it is also required to consider the interaction of those effects. This chapter addresses the intra project significant effects (i.e. those occurring between environmental topics within the project). Inter project effects (i.e. those which are likely to occur as a result of the likely effects of the proposed project interacting with the effects of other projects in the locality) have also been considered.

A review of a number of existing, planned and permitted projects that have the potential to interact with either the construction or operational phases of the Proposed Development has also been carried out. The list of these projects is provided in Section 2.10 of this EIAR.

### 17.2 Assessment Methodology

The EIAR has considered and assessed the interactive effects and cumulative effects arising from the construction and operational phases of the Proposed Development based on best scientific knowledge. The relevant interactions and interdependencies between specific environmental aspects have been summarised in the matrix set out in Table 17.1.

Interactive Effects (Or Interactions), specifically refer to any direct or indirect effects caused by the interaction of environmental factors as outlined in Article 3 (1) of the amended EIA Directive 2014/52/EU;

*“The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:*

- a) *population and human health;*
- b) *biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;*
- c) *land, soil, water, air and climate;*
- d) *material assets, cultural heritage and the landscape;*
- e) *the interaction between the factors referred to in points (a) to (d).”*

Annex IV of the amended Directive states that a description of effects should include:

*“the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the project”*

This approach is considered to meet with the requirements of Part X of the Planning and Development Act 2000 (as amended) and Part 10, and schedules 5, 6 and 7 of the Planning and Development Regulations 2001 (as amended) as well as the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

The 2022 EPA Guidance in turn references the EC *“Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (1999)”*. In terms of interactions, the guidelines state the following:

*"careful consideration of pathways – direct and indirect – that can magnify effects through the interaction or accumulation of effects – for instance, the potential for cumulative significant effects to arise from multiple non-significant effects."*

In terms of Cumulative effects, Annex IV (5) of the EIA Directive requires:

*"A description of the likely significant effects of the proposed project on the environment resulting from, inter alia...*

*(e) the cumulating of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;..."*

A review of a number of planned and permitted projects that have the potential to interact with either the construction or operational phases of the Proposed Development has been carried out. The list of these projects is provided in Section 2.10 of this EIAR.

### 17.3 Inter-Relationships / Interactions

In practice, many potential impacts from various sources have slight or subtle interactions with other sources of impact. However, the EIAR concludes that most inter-relationships are neutral in impact when the mitigation measures proposed in each chapter are incorporated into the operation of the Proposed Development.

A matrix of potential interactions identified between the various environmental factors assessed in this EIAR is provided in Table 17.1.

Descriptions of each of these potential interactions are provided in the following subsections of this Chapter.

Reference is made to Section 1.9.4 of this EIAR with respect to the various baseline scenarios that have been considered throughout this EIAR and are discussed in the following subsections, i.e. the Existing Baseline Scenario and the Operational Baseline Scenario.



Table 17.1: Matrix of Potential Interactions between Environmental Factors

|                                               | Population & Human Health |    | Landscape & Visual |    | Traffic & Transportation |    | Soils, Geology & Hydrology |    | Biodiversity |    | Noise & Vibration |    | Water & Wastewater |    | Air Quality |    | Climate |    | Waste Management |    | Material Assets |    | Archaeology, Architectural & Culture Heritage |    | Major Accidents & Disasters |    |
|-----------------------------------------------|---------------------------|----|--------------------|----|--------------------------|----|----------------------------|----|--------------|----|-------------------|----|--------------------|----|-------------|----|---------|----|------------------|----|-----------------|----|-----------------------------------------------|----|-----------------------------|----|
|                                               | Con                       | Op | Con                | Op | Con                      | Op | Con                        | Op | Con          | Op | Con               | Op | Con                | Op | Con         | Op | Con     | Op | Con              | Op | Con             | Op | Con                                           | Op | Con                         | Op |
| Population & Human Health                     |                           |    | X                  | X  | X                        | X  |                            |    |              |    | X                 | X  |                    |    | X           | X  |         |    | X                | X  |                 |    |                                               |    |                             | X  |
| Landscape & Visual                            |                           |    |                    |    |                          |    |                            |    | X            | X  |                   |    |                    |    |             |    |         |    |                  |    |                 |    |                                               |    |                             |    |
| Traffic & Transportation                      |                           |    |                    |    |                          |    |                            |    |              |    | X                 | X  |                    |    | X           | X  |         |    |                  |    |                 |    |                                               |    |                             |    |
| Soils, Geology & Hydrology                    |                           |    |                    |    |                          |    |                            |    | X            | X  |                   |    | X                  | X  | X           |    |         |    | X                |    |                 |    |                                               |    |                             |    |
| Biodiversity                                  |                           |    |                    |    |                          |    |                            |    |              |    | X                 | X  | X                  | X  | X           | X  |         |    | X                | X  |                 |    |                                               |    |                             | X  |
| Noise & Vibration                             |                           |    |                    |    |                          |    |                            |    |              |    |                   |    |                    |    |             |    |         |    |                  |    |                 |    |                                               |    |                             |    |
| Water & Wastewater                            |                           |    |                    |    |                          |    |                            |    |              |    |                   |    |                    |    |             |    |         |    |                  |    |                 |    |                                               |    |                             |    |
| Air Quality                                   |                           |    |                    |    |                          |    |                            |    |              |    |                   |    |                    |    |             |    |         |    |                  |    |                 |    |                                               |    |                             |    |
| Climate                                       |                           |    |                    |    |                          |    |                            |    |              |    |                   |    |                    |    |             |    |         |    |                  |    |                 |    |                                               |    |                             |    |
| Waste Management                              |                           |    |                    |    |                          |    |                            |    |              |    |                   |    |                    |    |             |    |         |    |                  |    | X               | X  |                                               |    |                             |    |
| Material Assets                               |                           |    |                    |    |                          |    |                            |    |              |    |                   |    |                    |    |             |    |         |    |                  |    |                 |    |                                               |    |                             |    |
| Archaeology, Architectural & Culture Heritage |                           |    |                    |    |                          |    |                            |    |              |    |                   |    |                    |    |             |    |         |    |                  |    |                 |    |                                               |    |                             |    |
| Major Accidents & Disasters                   |                           |    |                    |    |                          |    |                            |    |              |    |                   |    |                    |    |             |    |         |    |                  |    |                 |    |                                               |    |                             |    |

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### **17.3.1 Interaction between Population and Human and Health, and Landscape and Visual Construction Phase (including Demolition)**

The potential interaction between Population and Human Health and Landscape and Visual is discussed in *Chapter 4 Population and Human Health*. Landscaping can affect people's moods and their mental health. It is therefore appropriate that during the construction phase that mitigation measures to include, hoarding around the boundary of the site and the maintenance of existing treelines to soften the visual appearance of the site, be implemented and maintained.

As construction progresses the skyline of the facility will improve. Therefore, the potential landscape and visual impact of the construction phase of the Proposed Development is assessed as moderate, neutral and temporary to short-term.

#### **Operational Phase**

Once the Proposed Development is operational, the visual amenity from the River Boyne and the approach to Drogheda along the proposed Port Access Northern Cross Route (PANCR) will improve with an attractive eco façade that will represent a significant improvement from the current industrial landscape.

The changes to the visual amenity are considered positive, moderate and long-term.

### **17.3.2 Interaction between Population and Human Health, and Transport and Transportation Operational Phase**

The operational phase will result in ca. 50 staff entering and leaving the site at various times throughout the day. In addition, there will be a small number of heavy goods vehicle trips each day making deliveries and/or collecting waste.

*Chapter 6 Traffic and Transportation* assess the interaction of effects of additional traffic associated with the Proposed Development when operational on Population and Human Health. During the operational phase the effects on Population and Human Health for the operational phase is negative, not significant to moderate, and long-term.

#### **Construction Phase (including Demolition)**

As discussed in *Chapter 6 Traffic and Transportation*, during peak hours, the number of construction trips are expected to be lower than the number of operational trips discussed above. Therefore the potential effects on the Population and Human Health are expected to be negative, not significant and short-term.

### **17.3.3 Interaction between Population and Human and Health, and Noise and Vibration Construction Phase (including Demolition)**

*Chapter 9 Noise and Vibration* has assessed the potential noise effects on the site's nearest noise sensitive locations (NSLs), the nearest one being the permitted Large Residential Development (LRD), which is located directly adjacent to the Proposed Development site on the West (LCC Planning Ref. no. 2360053). The study concluded that the anticipated sound pressure levels at the NSLs during all construction activities are compliant with the applicable thresholds. There are no construction activities that would be expected to give rise to noise levels that would be considered out of the ordinary even if all equipment is operating simultaneously. Therefore the effect of noise from construction phase will have a short-term, slight-moderate negative effect at the LRD, and a short-term, not significant neutral effect at all other NSLs.

In addition to the above, there will be some explosive demolition works required. Explosions have the potential to generate significant noise levels. However the explosion events causing the high noise levels will be short in duration. Ultimately demolishing the buildings and structures in question by explosion reduces the duration of the demolition phase and its associated noise effects. Good liaison between the demolition team and neighbours (such as residents and commercial properties

in the vicinity) will be established, and all neighbours will be made aware of the proposed dates and times of the explosive demolition works well in advance of such works occurring.

In relation to potential vibration effects during the construction phase, they are likely to be limited given the breaking of existing structures and slabs, and excavations required. There is no data available in relation to vibration effects from rock breaking/hammering or excavations; therefore it is assumed that any vibrations caused by these works will be significantly less than the threshold for human perception and significantly less than the criteria for causing building damage. As stated above, some explosive demolition works are required, but these will be short in duration, and good liaison between the demolition team and neighbours will be established. The construction phase of the Proposed Development with respect to vibration will have a neutral, short-term, and imperceptible effect on Population and Human Health.

### **Operational Phase**

*Chapter 9 Noise and Vibration* includes details of a predictive noise modelling assessment that was carried out and included all potential operational phase noise sources. The assessment concluded that the potential effects of the operational phase of the Proposed Development on Population and Human Health are likely to be long-term, neutral and imperceptible during the daytime (07:00-19:00) and evening time (19:00-23:00) periods, and long-term, negative and not significant at night-time (23:00-07:00).

There will be no sources of vibration associated with the operations of the Proposed Development; therefore there will be no vibration effects on Population and Human Health during the operational phase.

## **17.3.4 Interaction between Population and Human Health, and Air Quality**

### **Construction Phase (including Demolition)**

The construction phase, including the demolition works has the potential to generate dust, which has the potential to negatively affect the Population and Human Health. Other emissions of concern for the construction stage are those that associated with all motorised vehicles, plant and equipment and include NO<sub>2</sub>, CO, PM<sub>10</sub>. *Chapter 11 Air Quality* details the mitigation and management process that will be employed during the construction phase to address any concerns.

The potential effects on Population and Human Health are considered short-term, neutral and not significant when the recommended mitigation measures are implemented.

### **Operational Phase**

*Chapter 11 Air Quality* details an extensive air dispersion modelling assessment carried for the operational phase of the Proposed Development. The modelling included the 9 no. gas engines to be located in the EC. A conservative approach was taken with all 9 no. engines assumed to be running at 100% load 24/7, which as described in *Chapter 2 Description of the Proposed Development*, will not be the case in reality. The results of this conservative assessment were that there is predicted to be a long-term, neutral and imperceptible effect on offsite receptors, or the Population and Human Health.

## **17.3.5 Interaction between Population and Human Health, and Waste Management**

### **Construction Phase (including Demolition)**

The implementation of the mitigation measures outlined in *Chapter 13 Waste Management* will ensure that targeted rates of reuse, recovery and recycling are achieved at the site of the Proposed Development during the construction phase. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved. The preparation of a Resource Waste Management Plan (RWMP) will ensure that maximum benefit and proper management, storage and transport of the wastes generated. The possible negative effects of demolition and construction waste arising

can be mitigated, resulting in a slight, negative and brief to short-term effect on Population and Human Health.

### **Operational Phase**

The operational phase is expected to see a marked reduction in waste produced on site from the operational baseline scenario (see Section 1.9.4 of this EIAR). When compared to the current baseline scenario, with proper management, storage and transport of the wastes generated, the possible effects on Population and Human Health can be mitigated, resulting in an imperceptible, neutral and long-term effect.

## **17.3.6 Interaction between Population and Human Health, Biodiversity and Major Accidents and Disasters**

### **Operational Phase**

A detailed assessment determining the potential effects for Population and Human Health from potential major accidents and disasters was carried out and is described in *Chapter 16 Major Accidents and Disasters* of this EIAR. This assessment concluded that “No plausible potential risks were identified which would result in the Proposed Development causing a major accident or disaster on or outside of the Proposed Development.”

It is therefore concluded that the risk to Population and Human Health (and Biodiversity) is Long Term, Neutral and Not Significant.

## **17.3.7 Interaction between Biodiversity, Soils, Geology and Hydrogeology, and Water and Wastewater**

### **Construction Phase (including Demolition)**

The interaction between biodiversity, and soils, geology and hydrogeology is predominately associated with the production of dust interfering with photosynthesis, the possible introduction of non-native species by vehicle movement, and the impact of any silt entering watercourses degrading and damaging aquatic flora and fauna because of cutting, filling and stockpiling etc. In terms of habitat destruction, fragmentation and mortality, no significant habitat has been identified within in the confines of the PPL site and no long-term effect is expected.

In the case of the interaction of biodiversity, and water and wastewater, the potential effects are centred around the Source-Pathway-Receptor Model and any pollutant that may escape from the site. Other than an escape of a pollutant of the site directly via the seawater outlet the most likely hydrogeological/hydrological linkages (e.g. rivers or groundwater flows) between impact sources and wetland/aquatic habitats can often result in impacts occurring at significant distances. The underlying aquifers have low permeability which decreases with depth. An upper shallow zone of higher permeability may exist in the top few meters and is associated with relatively short flow paths. Therefore, any influence on the groundwater as a result of the proposed works will be localised and will not extend to any groundwater-dependent habitats which are all located over 7km from any proposed work.

*Chapter 8 Biodiversity* discusses biodiversity in detail and finds that the construction phase of the Proposed Development will have No Significant Short or Long Term effects once the identified mitigation measures are in place, observed, adhered to and monitored.

### **Operational Phase**

The Proposed Development is hydrologically connected to the Irish Sea via surface water discharge and to the Boyne Estuary and Boyne River via surface water and groundwater connectivity. Therefore there are potentially significant interactions identified between soils, geology, hydrogeology, and water and wastewater centred around the possible release of pollutant matter during operations resulting in the degradation of groundwater and surface water habitats. In such cases, a reduction in water quality (either alone or in combination with other pressures on water quality) could result in the degradation of sensitive habitats present within these European sites, which in turn, would negatively affect the Special Conservation Interest (SCI) breeding and

wintering bird species, as well as Otter and Marine mammal species that rely upon these habitats as foraging and / or roosting habitat. It could also negatively affect the quantity and quality of prey available to SCI bird species. Such a polluting incident would equally effect fish species including Atlantic Salmon and Rive Lamprey, etc. and possible set back conservation goals by years.

Taking into account the design and mitigation measures set out in *Chapter 7 Soils, Geology and Hydrogeology* and *Chapter 10 Water and Wastewater* of this EIAR, and with their full implementation and giving cognisance to the fact that there will be no significant bulk storage of liquid fuel or other hazardous liquids on site, then negative effects during the operational phase are considered unlikely.

### **17.3.8 Interaction between Biodiversity, Waste Management and Material Assets**

The incorrect management of waste during both the construction and operational phases has the potential to cause effects on local biodiversity. Improperly discarded waste has the potential to disrupt the existing mammal community by promoting conditions which are more favourable for certain species, e.g. scavengers. For instance, all edible and putrescible waste (e.g. improperly discarded food) has the potential to attract scavengers and to potentially disrupt the existing non-volant mammal community.

With proper management, storage and transport of the wastes generated, the potential effects on biodiversity are considered to be neutral, imperceptible and short-term for the construction phase, and neutral, imperceptible and long-term for the operational phase (refer to Section 13.7 for the waste management mitigation measures that will be implemented).

### **17.3.9 Interaction between Biodiversity and Noise and Vibration Construction Phase (including Demolition)**

There are a number of European designated sites located in relatively close proximity to the Proposed Development where Special Conservation Interest (SCI) species are known to forage and/or roost such as the Boyne Estuary SPA, River Nanny Estuary, etc. Current knowledge in respect to disturbance by construction noise suggests that noise levels below 50 dB is not expected to produce any response. However, above 50 dB, increasing levels of response can be observed with birds in particular moving from the area when noise levels exceed 70 dB.

As the Proposed Development is close to areas of highly suitable habitat for wintering birds, i.e. Boyne Estuary, and the Nanny Estuary there is a potential for the Proposed Development to impact and affect the conservation status of wintering bird populations. It is noted, however that birds most at risk of disturbance and displacement are expected to be those loafing and wading in the vicinity of the Proposed Development. The nearest areas most suitable for the congregation of large numbers of loafing and wading birds are located several hundred meters east of the site in the area of exposed mudflats. This distance from the area of construction, to these mudflats, along with the background noise levels of the operational Drogheda port and the mitigation measures outlined in the NIS (Scott Cawley Ltd., 2024), CEMP and *Chapter 9 Noise and Vibration* of this EIAR, indicate that no likely significant disturbance or displacement effect is expected on birds in the vicinity during construction.

In respect to other species including mammals, such as otters that are known to be present along the River Boyne, construction and traffic associated with site clearance and construction, particularly around the leased quay, (for which the existing conveyor structure is proposed to be removed), could temporarily disturb mammals such as otter and is likely to displace them from habitat areas adjacent to the footprint of the Proposed Development. However, there are numerous records of otter along the River Boyne and similar data from the estuarine part of the River Liffey, which would suggest a relatively high level of habituation to human disturbance and noise. In addition, construction works will be undertaken during normal daylight working hours where practicable and otter are generally nocturnal in habit. Therefore displacement of otter from their commuting, and foraging habitat is extremely unlikely to affect the local otter population, at any geographic scale.

The overall effect is expected to be temporary to short-term, negative and not significant.



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### **Operational Phase**

The plant will operate on a 24/7 basis with predicted sound pressure levels predicted to be less than 50 dB(A) at any European designated site which is below the level expected to produce any response. Therefore disturbance or effects to biodiversity as a result of the operational phase is considered long-term, neutral and imperceptible.

#### **17.3.10 Interaction between Biodiversity and Air Quality**

##### **Construction Phase (including Demolition)**

The construction phase, including the demolition works has the potential to generate dust, which has the potential to negatively affect Biodiversity. Other emissions of concern for the construction stage are those that associated with all motorised vehicles, plant and equipment and include NO<sub>2</sub>, CO, PM<sub>10</sub>. *Chapter 11 Air Quality* details the mitigation and management process that will be employed during the construction phase to address any concerns.

The potential effects on Biodiversity are considered short-term, neutral and not significant when the recommended mitigation measures are implemented.

##### **Operational Phase**

*Chapter 11 Air Quality* details an extensive air dispersion modelling assessment carried for the operational phase of the Proposed Development. The modelling included the 9 no. gas engines to be located in the EC. A conservative approach was taken with all 9 no. engines assumed to be running at 100% load 24/7, which as described in *Chapter 2 Description of the Proposed Development*, will not be the case in reality.

The assessment considered the critical levels for annual NO<sub>x</sub> at designated European sites in the vicinity of the PPL site.

The results of the conservative assessment for the potential operational effect of air emissions on ecosystems from the Proposed Development can be deemed as negative and long-term but not significant.

#### **17.3.11 Interaction between Biodiversity and Landscape and Visual**

##### **Construction Phase (including Demolition)**

The interaction between Biodiversity and Landscape and Visual centres around the protection of existing trees, hedgerows and vegetation to be retained within and adjoining the works area, including along the northern boundary of the site and any habitat they offer. To that end, the monitoring of the removal and protection of trees and vegetation shall be inspected and approved by a project ecologist before any works are carried out to minimise negative effects. Given that landscaping restoration will be carried out towards the end of the construction phase of the Proposed Development, the overall effects are considered short-term, neutral and slight.

##### **Operational Phase**

Completion of the Proposed Development, including proposed landscape measures and works, has the potential to give rise to moderate to significant positive impacts on the landscape and visual environment. This potential for positive effects – especially in terms of the presentation of the site and facility for the surrounding environment along the River Boyne / Boyne Estuary – relates to the potential for substantial improvement to the existing industrial character of the site and from the successful implementation and establishment of the extensive landscape measures proposed as part of the redevelopment of the site.

The removal of the existing poor quality, visually prominent industrial facility, and its replacement with a high quality development with extensive landscape measures and planting will substantially enhance the quality of the visual character and views along and across the River Boyne / Boyne Estuary.

The Proposed Development includes, a solar array to be built on the existing landfill site, stockpile no. 3 and on the roofs of the EC and DC, and facades of the DC. Glint and glare from the proposed

solar arrays could have potential negative effects on wildlife, which can arise from birds colliding with solar panels which they have mistaken for water resources. Studies have found that the photovoltaic (PV) panels can cause the 'lake effect' on birds, whereby birds mistake the PV panels as waterbodies and try to land on them<sup>173</sup>. Birds are mobile species and wintering species can travel up to 20km between roosting and feeding sites, therefore there is potential for birds to be affected by disturbance impacts from the proposed solar farm. However, it should be noted, that the Proposed Development provides no ex-situ habitat for SCI birds and screening in the form of vegetation will minimise the chance of disturbance. Therefore there will likely be no significant effects from glint and glare associated with the solar farm.

Therefore, the overall potential landscape and visual impact of the operational phase of the Proposed Development on Biodiversity is assessed as Moderate-Significant, Long-Term and Neutral/Positive.

### **17.3.12 Interaction Noise and Vibration, and Traffic and Transportation** **Construction Phase (including Demolition)**

*Chapter 9 Noise and Vibration* assessed the potential effects from traffic and transportation on expected noise levels from the Proposed Development by carrying out noise predictive calculations for the HGVs entering and leaving the site. The assessment concluded that the potential effect associated with construction traffic noise is negative, not significant and short-term.

There is no expected vibration associated with the interaction of traffic during the construction phase.

#### **Operational Phase**

During the operational phase of the Proposed Development, there will be an increase in vehicular traffic associated with the site and other planned developments on surrounding roads. The predicted change in noise levels due to an increase in road traffic has been calculated for each of these roads, using projected traffic data as detailed in *Chapter 6 Traffic and Transportation* of this EIAR.

The assessment concluded the potential traffic level increases attributable to the Proposed Development will give rise to imperceptible increases of noise levels at all roads in the vicinity of the site, with the exception of the site entrance on Boyne Avenue, a significant effect is predicted. It is noted that the site entrance is within the boundary of the Proposed Development, and the increases in traffic levels on the site entrance are to be expected given the minimal activity on the site at present.

There is no expected vibration associated with the interaction of traffic during the operational phase.

### **17.3.13 Interaction Traffic and Transportation, and Air Quality** **Construction Phase**

As discussed in *Chapter 11 Air Quality*, given the expected traffic levels during the construction phase, and taking cognisance of Transport Infrastructure Ireland (TII) Guidance<sup>174</sup> and the *Highways England Design Manual for Roads and Bridges* (DMRB)<sup>175</sup>, the Proposed Development can be scoped out and does not require further assessment with respect to potential air quality effects from construction traffic. Therefore it can be assumed that the potential effects on air quality due to the construction traffic associated with the Proposed Development can be considered to be neutral, imperceptible and short-term.

#### **Operational Phase**

<sup>173</sup> Kagan, R. A., T. C. Viner, P. W. Trail, and E. O. Espinoza. 2014. Avian mortality at solar energy facilities in Southern California: a preliminary analysis. National Fish and Wildlife Forensics Laboratory, Ashland, Oregon, USA

<sup>174</sup> Transport Infrastructure Ireland (TII), (2022), Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document, PE-ENV-01106

<sup>175</sup> Highways England Design Manual for Roads and Bridges (DMRB) (2019), LA 105 Air Quality, Rev 0

As discussed in *Chapter 11 Air Quality*, given the expected traffic levels during the operational phase, and taking cognisance of Transport Infrastructure Ireland (TII) Guidance<sup>176</sup> and the *Highways England Design Manual for Roads and Bridges* (DMRB)<sup>177</sup>, the Proposed Development can be scoped out and does not require further assessment with respect to potential air quality effects from operational traffic. Therefore it can be assumed that the potential effects on air quality due to the operational traffic associated with the Proposed Development can be considered to be neutral, imperceptible and long-term.

### 17.3.14 Interaction between Soil, Geology, Hydrogeology and Waste Management Construction Phase

Enabling works, localised remediation, cutting, and filling works will increase the amount of waste material to be removed off site by an anticipated ca. 20,000 m<sup>3</sup> of soil that will require specialised treatment offsite. The interaction that is expected between Soil, Geology and Hydrogeology, and Waste Management is predicted to be a temporary, negative and slight effect.

### 17.3.15 Interaction between Soil, Geology and Hydrogeology, and Air Quality Construction Phase

Demolition and construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for effects on air quality in the form of dust emissions. Dust impacts visibility and the quality of air for breathing. However, dust tends to fall a short distance from where it is produced with the possible exceptions of PM<sub>10</sub> and PM<sub>2.5</sub>, which can linger in the air mass and travel for some time. It is therefore important the mitigation measures including timing of excavations and stockpiling are conscious of wind speed and wind direction. With the proposed mitigation measures as described in *Chapter 11 Air Quality* to prevent fugitive dust emissions, it is predicted that the potential effects will be short-term, neutral and not significant.

## 17.4 Cumulative Effects

### 17.4.1 Introduction

Cumulative effects may result by the addition of many minor or insignificant effects from the Proposed Development and other relevant projects to create larger, more significant effects. The 2022 EPA states:

*"While a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or insignificant), result in a cumulative impact that is collectively significant. For example, effects on traffic due to an individual industrial project may be acceptable; however, it may be necessary to assess the cumulative effects taking account of traffic generated by other permitted or planned projects. It can also be prudent to have regard to the likely future environmental loadings arising from the development of zoned lands in the immediate environs of the proposed project."*

A review of Louth County Council (LCC) and Meath County Council planning applications received was performed to identify a list of projects in the vicinity of the Proposed Development site that have been granted planning permission which either are existing, unbuilt and have extant permission or are under construction. The list has been filtered down to exclude minor projects that are unlikely to interact with the Proposed Development to any level of significance.

Details of the relevant planned or permitted developments within the vicinity and context of the Proposed Development which have been considered as part of the assessment of potential cumulative effects are outlined in Section 2.10 in *Chapter 2 Description of Proposed Development* of this EIAR and in Table 17.2. The locations of these developments are shown in Figure 17.1.

**Table 17.2:** Projects considered in respect of Cumulative Effects

<sup>176</sup> Transport Infrastructure Ireland (TII), (2022), Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document, PE-ENV-01106

<sup>177</sup> Highways England Design Manual for Roads and Bridges (DMRB) (2019), LA 105 Air Quality, Rev 0

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| Planning Ref:                       | Project                                  | Brief description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LCC Ref: 2360053                    | Large Scale Residential Development.     | A permitted large scale residential development to include 42 houses, 150 Apartments, a Crèche, a Café, a Gymnasium and associated works.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| LCC Ref: 2360137                    | Self Storage Facility.                   | A permitted self-storage facility currently under construction comprising approximately 2588sqm gross floor area, in 4 blocks, with individual units ranging in size from 12sqm to 30sqm, a single storey office/service building, signage, car parking spaces and all associated site development works.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| LCC Ref: 2288                       | Boyne Mills                              | A permitted development which includes the demolition of various existing buildings on the site and the construction of circa. 22,093 m <sup>2</sup> gross floor area of a mixed-use scheme comprising the construction of a four storey building, providing a digital innovation hub, co-working space and a restaurant; the construction of a two storey building providing 5 no. retail units and office space; the construction of a two storey over basement building providing a cultural facility, as well as a car park at ground floor and basement levels; the construction of a two storey building providing a restaurant; the construction of 2 no. five storey buildings providing 64 no. apartment units; and the renovation and adaption of the former Boyne Mill Yarn Store to provide a five storey 120 no. bedroom hotel with an ancillary restaurant. |
| LCC 22504 / Bord Pleanála 316379-23 | New Apartment Development at Cord Road   | A permitted development which includes the demolition of an existing warehouse; the construction of a 3-6 storey apartment development comprising a total of 40 no. units; the provision of a communal courtyard open space; the provision of undercroft car park with new access from North Strand Road and providing 20 no. parking spaces; and the refurbishment and alteration to Boyne Cottage to provide for a single residential dwelling with separate private garden and vehicular access from Cord Road/Greenhills Road.                                                                                                                                                                                                                                                                                                                                        |
| N/A                                 | Drogheda Port, Tom Roe's Point Facility  | Detailed consultation has taken place between PPL and the Port on its future plans. PPL and the Port will collaborate across multiple workstreams including the PANCR Road development, and increased business for the Port from the new enterprises operating from the PPL CORE Campus.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| N/A                                 | Port Access Northern Cross Route (PANCR) | A new Port access road from the R132 Dublin Road across the Twenties Road and to tie into the Ballymakenny road and upgrading of the adjacent roads.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| LCC Ref: 21600                      | Road extension & Realignment             | Construction of road extension and realignment of the existing junction at the Boyne Business Park entrance at Newtownstalaban Drogheda.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |



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| Planning Ref:   | Project                                | Brief description                                                                                                                                                                                                                                               |
|-----------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LCC Ref: 211000 | Office Extension                       | A permitted development which includes a proposed new two storey extension to front and side of existing office building together with alterations to existing elevations, new signage to front elevation, foul and surface drainage and associated site works. |
| LCC Ref: 20733  | Cargo Warehouse building Drogheda Port | A permitted new cargo warehouse building on the existing quayside storage area at Drogheda Port, Co. Louth.                                                                                                                                                     |
| N/A             | Existing Flogas Terminal               | Existing Flowgas LPG importation and storage facility.                                                                                                                                                                                                          |

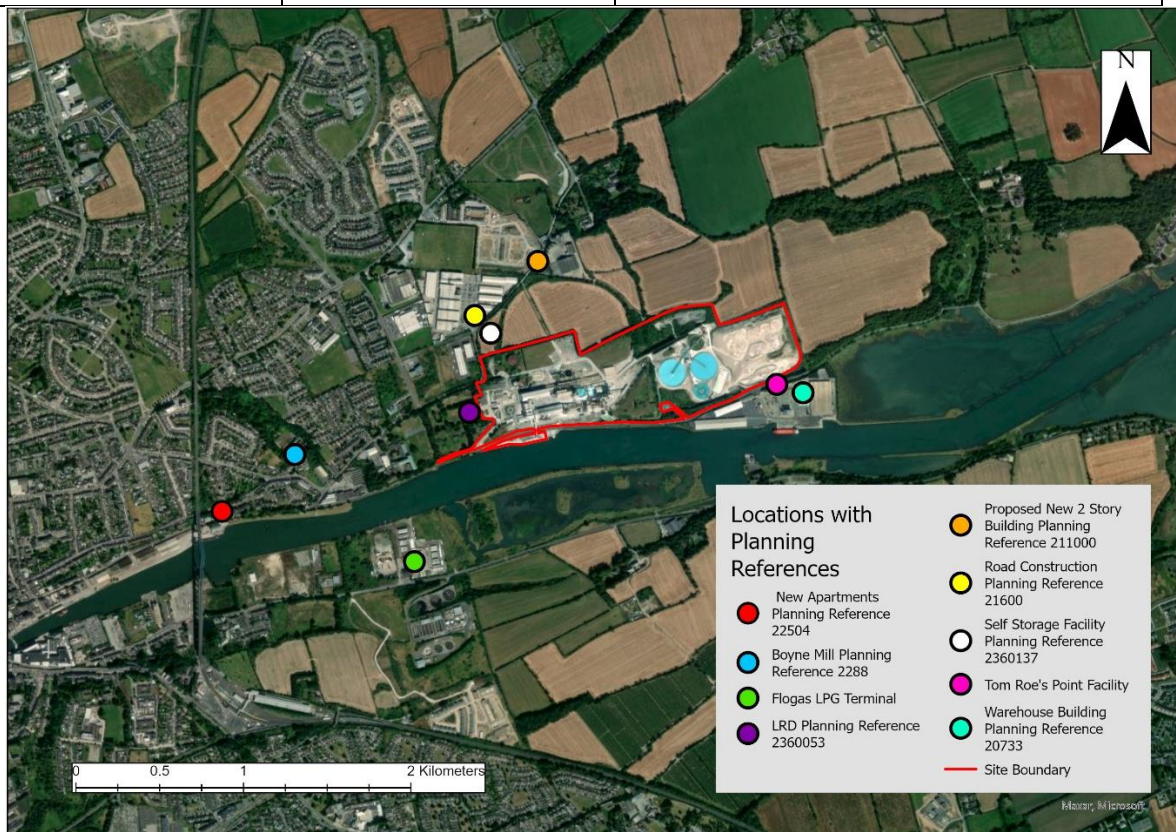


**Figure 17.1:** Projects Identified for the Consideration of Cumulative Effects

Chapters 4-16 of this EIAR contain specific sections on the potential cumulative effects associated with each environmental topic. These assessments have been summarised in the following subsections.

#### 17.4.2 Population and Human Health Construction Phase (including Demolition)

The Proposed Development and the other identified developments will result in potential cumulative effects on the various environmental factors assessed in other chapters of this EIAR. However, provided standard mitigation measures set out in the EIARs and CEMPs for these developments or where EIA does not apply, provided that planning conditions are implemented, the cumulative effect will be short-term, negative and not significant.

The cumulative effects of the Proposed Development on the local population and employment will have a predominantly Positive effect. This is because of the combined contribution to employment



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and benefits to the local economy and Drogheda as a whole due to the Proposed Development and other relevant projects.

### **Operational Phase**

The Proposed Development and the other identified developments will result in potential cumulative effects on the various environmental factors assessed in other chapters of this EIAR. However, provided standard mitigation measures set out in the EIARs for these developments or where EIA does not apply, provided that planning conditions are implemented, the cumulative effect will be long-term, negative and not significant.

This Proposed Development to which this planning application relates will have a positive effect in terms of an improvement in the visual appearance of the area and a reduction to the potential for nuisance / amenity impacts, compared to the operation of the existing facility (operational baseline scenario as described in Section 1.9.4 of this EIAR).

The construction of the PANCR is underway in stages. This new route will interface and improve access to the Port and the Proposed Development, opening additional lands that are zoned E1 "For General Employment". The attractiveness of this new land for investment can only be enhanced by the presence of the Proposed Development which has the potential in the future to provide a source of economical green electricity and heat for district heating and other heat required purposes.

#### **17.4.3 Landscape and Visual**

##### **Construction Phase (including Demolition)**

Landscape and visual mitigation measures will be monitored during the demolition and construction stage. This will include the establishment and maintenance of tree and vegetation protection fencing, the siting of construction compounds; stripping and storage of soils; reinstatement of landscape / soil areas; and completion of landscape works. No significant direct or indirect cumulative landscape or visual impacts have been identified for the construction phase.

##### **Operational Phase**

The cumulative effects of the Proposed Development and the projects identified in Table 17.1 are accessed in Section 5.8 of *Chapter 5 Landscape and Visual* and No significant cumulative landscape or visual impacts have been identified for the operational phase.

#### **17.4.4 Traffic and Transportation**

Section 6.10 of *Chapter 6 Traffic and Transportation* has summarised the cumulative effects of the entire project, with particular emphasis on strategic road junctions serving the Proposed Development and finds that with the exception of R167 Strand Road / R899 Greenhills Road Junction, where expected delays will be a maximum of 110 seconds, which is less than the 120 seconds that is considered as typical for an urban environment, the effects are Long term, Neutral and Imperceptible. For the R167 Strand Road / R899 Greenhills Road Junction, the effects are Long term, Negative and Moderate.

#### **17.4.5 Soils, Geology and Hydrology**

##### **Construction Phase (including Demolition)**

Given the low level of residual effects on geological and hydrogeological features associated with the construction phase, there will be limited potential for cumulative effects to arise.

Concurrent construction works at the site and other development sites will be completed in accordance with project-specific CEMPs. The necessary environmental protection measures in compliance with legislative requirements and best practice will be implemented to protect and minimise the effects on geological and hydrogeological features such that no significant cumulative effects are predicted.

##### **Operational Phase**

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Given the low level of residual effects on geological and hydrogeological features associated with the operational phase of the Proposed Development, there will be limited potential for cumulative effects to arise.

It is noted that development at nearby sites may result in an increase in hardstanding / building footprint, which, together with the Proposed Development, could result in localised reduced groundwater recharge and an increased storm water run-off rate. However, each permitted development is required by the Local Authority and Uisce Éireann to provide suitable attenuation / SuDS measures in order to maintain and protect the natural water cycle and decrease the risk of off-site flooding as a result of development such that no significant cumulative effects are predicted.

#### 17.4.6 Biodiversity

*Chapter 8 Biodiversity* has considered and assessed the direct, indirect and in-combination effects of any projects approved and that might have the potential for likely significant impacts. However, given that no significant residual effects were identified from the Proposed Development, there can be no cumulative effects from the Proposed Development with other approved projects or projects which are in the public domain.

#### 17.4.7 Noise and Vibration

##### Construction Phase (including Demolition)

There is the potential for there to be an increase in construction noise in the area if the construction phases of the various development overlap with the Proposed Development, e.g. construction of the permitted Large Scale Residential Development (LRD) to the west of the PPL is due to commence in July 2025.

However assuming all mitigation measures proposed in Section 9.7.1 of this EIAR as well as all mitigation measures proposed as part of the planning applications for the permitted developments are implemented in full, and also given the existing noise levels in the area as described in Section 9.3, any potential cumulative effects in relation to noise levels in the area are anticipated to be minimal. In addition, any potential cumulative effects will be temporary in nature and will only exist for the period that the construction phases overlap with each other.

Given that there are predicted to be imperceptible construction vibration effects from the Proposed Development only, and given the nature of the other permitted and Proposed Developments in the area, there are no cumulative vibration effects predicted during the construction phase.

##### Operational Phase

Based on the information available on the publicly available planning files and given the nature and scale of the other developments in question, it is concluded that none of these developments have the potential to cause cumulative effects with the Proposed Development with respect to noise and vibration during the operational phase.

All existing noise sources in the vicinity of the Proposed Development site have been captured in the results of the existing baseline noise survey described in Section 9.3 of this EIAR. The cumulative effect of existing ambient noise and predicted noise due to the Proposed Development have been calculated by adding the model predicted noise contribution to existing average ambient noise levels at the receiver points (NSLs). The results of this assessment concluded:

- There is predicted to a 1 dB(A) increase in existing noise levels during both the daytime (07:00-19:00) and evening time (19:00-23:00) periods. This is defined as a negligible increase.
- There is predicted to a 3 dB(A) increase in existing noise levels during the night-time (23:00-07:00) period. This is defined as a minor increase.

#### 17.4.8 Water and Wastewater

##### Construction Phase (including Demolition)

Given the low level of residual effects on hydrological features associated with the construction phase, there will be limited potential for cumulative effects to arise.

Concurrent construction works at the site and other development sites will be completed in accordance with project-specific CEMPs. The necessary environmental protection measures in compliance with legislative requirements and best practice will be implemented to protect and minimise the effects on the local water environment such that no significant cumulative effects are predicted.

### **Operational Phase**

Given the low level of residual effects on hydrological features associated with the operational phase of the Proposed Development, there will be limited potential for cumulative effects to arise.

Increase in wastewater loading at Drogheda MWWTP and increase in mains water supply is an effect of all developments. Each development will require approval from Uisce Éireann confirming available capacity in the water and wastewater infrastructure. The storm water and foul drainage infrastructure and water supply requirements for the Proposed Development have been designed and assessed to accommodate the requirements of the Proposed Development.

All developments will be required to manage any discharges to water and operate in compliance with relevant legislation such that there will be no likely cumulative effect on water quality.

It is noted that development at nearby sites may result in an increase in hardstanding / building footprint which, together with the Proposed Development, could result in an increased storm water run-off rate. However, each permitted development is required by the Local Authority and Uisce Éireann to provide suitable attenuation / SuDS measures in order to maintain and protect the natural water cycle and decrease the risk of off-site flooding as a result of development such that no significant cumulative effects are predicted.

## **17.4.9 Air Quality**

### **Construction Phase (including Demolition)**

As regards potential cumulative effects in relation to air quality, it is anticipated that there will be an increase in emissions to air during this phase due to the construction activities noted in Section 11.4.1.

However, assuming all mitigation measures proposed in Section 11.7.1 as well as all mitigation measures proposed as part of the planning applications for the permitted developments considered as part of the cumulative impacts assessment are implemented in full, any potential cumulative effects air emissions are anticipated to be minimal. Any potential cumulative effects will be negative, not significant, temporary in nature and will only exist for the period that the construction activities overlap with each other.

### **Operational Phase**

A comprehensive air dispersion modelling assessment for potential cumulative effects was completed for concentrations of NO<sub>x</sub> and CO<sub>2</sub>. The assessment was carried out to determine potential cumulative effects on both human health and vegetation, and the assessment concluded that the cumulative effects will be not significant for all scenarios assessed.

## **17.4.10 Climate**

In relation to climate, all global cumulative GHG sources are relevant to the effect on climate change. As a result, the effects of GHG emissions from specific cumulative projects therefore in general should not be individually assessed. This is due to the fact that there is no basis for selecting any particular (or more than one) cumulative project that has GHG emissions for assessment over any other (IEMA, 2022).

## **17.4.11 Waste Management**

### **Construction Phase (including Demolition)**

Given the low level of residual effects in relation to waste management associated with the construction phase of the Proposed Development, there will be limited potential for cumulative effects to arise.

Concurrent construction works at the site and other development sites will be completed in accordance with project-specific CEMPs. The necessary environmental protection measures in compliance with legislative requirements and best practice will be implemented to protect and minimise the effects in relation to waste management such that no significant cumulative effects are predicted.

### **Operational Phase**

Given the low level of residual effects in relation to waste management associated with the operational phase of the Proposed Development, there will be limited potential for cumulative effects to arise.

It is noted that development at nearby sites as well as the Proposed Development may result in a cumulative increase in waste generation in the area. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area, as well as the Proposed Development, will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such, no significant cumulative effects are predicted.

## **17.4.12 Material Assets**

### **Construction Phase (including Demolition)**

The Proposed Development and the other identified developments will require site clearance, excavations and levelling which will generate localised requirement for soil removal and/or import, power and water supply and wastewater discharge. However, provided standard mitigation measures set out in the EIARs and CEMPs for these developments or where EIA does not apply, provided that planning conditions are implemented, the cumulative effect will be short-term, negative and not significant.

### **Operational Phase**

The Proposed Development and all identified developments considered are required to engage with Gas Networks Ireland, Louth County Council, Uisce Éireann and ESB to ensure that there is sufficient capacity to cater for the increase in gas, water and wastewater and electricity requirements. In developing long term plans for security of supply, these National Authorities are required to develop resources in compliance with sustainable environmental planning.

In relation to the potential cumulative effects on the material assets during the operational phase (when compared to the operational baseline scenario), works which would have potential cumulative effects include:

- Increased demand for telecommunications and broadband,
- Increased demand for grid-supplied electricity,
- Reduced demand for natural gas.

Provided standard mitigation measures set out in the EIARs for these developments are implemented or where EIA does not apply, provided that planning conditions are implemented, the cumulative effect on the material assets for the operational phase is anticipated to be long-term, neutral and imperceptible.

With respect to the LRD development adjacent to the PPL site to the west (LCC Planning Ref. 2360053), the Proposed Development will have a positive effect by removing an industrial site, which in its present form is purely functional and unattractive.

## **17.4.13 Archaeology, Architectural and Cultural Heritage**

No potential cumulative effects were identified in the course of the Archaeology, Architectural and Cultural Heritage assessment.

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#### 17.4.14 Major Accidents and Disasters

The potential cumulative effects associated with the Proposed Development of the proposed site was considered and no significant impacts were considered likely.

Cumulative effects related to major accidents, as described *Chapter 16 Major Accidents and Disasters*, are not expected.



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## 18 Summary of Mitigation Measures and Monitoring

### 18.1 Introduction

The various environmental topics assessed in Chapters 4 to 16 have identified, as appropriate, specific mitigation measures to address potential adverse effects.

This chapter summarises in Table 18.1 these mitigation and monitoring measures for the proposed development. The likely resulting residual effects associated with the Proposed Development are also outlined in Table 18.1.

**Table 18.1:** Summary of Mitigation Measures and Residual Environmental Effects

| Environmental Factor               | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| <b>Population and Human Health</b> | <p><b><u>Construction Phase (including Demolition)</u></b></p> <p>The design of the Proposed Development has been subjected to a safety design reviews to ensure that all requirements of the Proposed Development are safe. A Project Supervisor for the Design Stage (PSDS) has been appointed as part of this process who has reviewed every aspect of the design and has developed the Preliminary Safety Plan.</p> <p>During the demolition, remediation and construction, there will be potential risks to the health and safety of personnel. PPL will appoint a Project Supervisor Construction Stage (PSCS) following contracts award who will develop the Safety Plan in advance of the Construction Phase commencing based on the Safety Plan developed by the PSDS at design and update as necessary. The PSCS will ensure that all personnel on site hold the Safe Pass and the Construction Skills Certification Cards and other qualification as required to operate machinery. The PSCS will secure the site, control access to the site and oversee all operation on site (further details of the PSCS's role in the Construction Phase is detailed in the Outline Construction Environmental Management Plan (PM Group Report No. IE0313391-22-RP-0003) accompanying this planning application).</p> <p>As mentioned above, a comprehensive Health and Safety Plan will be put in place on the site before the commencement of any works to include demolition and construction to minimise any risks to site personnel and visitors. The requirements of both the Safety, Health and Welfare at Work Act 2005 as amended and the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013) as amended will be complied with at all times.</p> <p>As well as the Health and Safety Plan mentioned above, the demolition and construction will also operate under the strict control of the Demolition Method Statement (DMS) and the CEMP. Only experienced, trained and qualified contractors will be permitted to undertake demolition works. Part of the tendering process for each element of the project will require candidates to demonstrate their expertise, knowledge and experiences in the relevant fields.</p> <p>The construction phase will also be operated under the Health and Safety Plan, Construction Environmental Management Plan (CEMP) and a Construction Traffic Management Plan that will alleviate the potential effects of the construction on the local community. Further details are provided in the CEMP accompanying this planning application and in <i>Chapter 6 Traffic and Transportation</i> of this EIAR.</p> <p>Full consultation with local stakeholders will be undertaken prior to and throughout the construction phase (including demolition) to keep local residents and other stakeholders (LCC, local businesses, etc.) fully informed as to the project status, what to expect and all measures to be employed to mitigate any temporary nuisance that may be unavoidable as part of the works.</p> <p>Safety will be a primary concern during the construction phase of the Proposed Development. A contractor safety management programme to include detailed risk assessments by qualified and experienced personnel will be implemented, identifying potential hazards associated with the proposed work. A permit to work system will be operated for particular dangerous and environment critical operations as determined by the PSCS.</p> <p>Temporary contractor facilities and areas under construction will be enclosed and fenced off from the public with visible warning signs of the risks associated with entry to these facilities. Entry to these areas will be restricted and will be kept secure when construction is not taking place. Security will be in place at site entry to control access and egress to the site. Measures to ensure public safety with respect to construction traffic, are detailed in <i>Chapter 6 Traffic and Transportation</i>.</p> <p>A detailed Asbestos Management Plan (AMP) for any excavation works on the site shall be developed by an asbestos consultant prior to commencement of any demolition works with all mitigation measures, including site operative training and procedures, roles and responsibilities of individuals and monitoring measures detailed within the document.</p> <p>All excavation operations shall be undertaken on the assumption that asbestos containing materials (ACMs) or asbestos pipework could be encountered and appropriate health and safety including appropriate Personal Protection Equipment (PPE) provided to relevant site operatives working in these areas.</p> <p>The asbestos consultant shall advise if HSA notification is required prior to the commencement of any site excavation operations in accordance with <i>The Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations, 2006 &amp; 2010</i>.</p> <p>All asbestos material identified shall be carefully removed and appropriately double-bagged and safely stored on-site for off-site disposal by a suitable licenced waste haulage company to an asbestos licenced waste disposal facility.</p> <p>All excavation operations in areas suspected to contain ACMs shall be supervised by an asbestos consultant.</p> <p>Should additional unknown asbestos material be uncovered during the demolition of the site, all related works and works adjacent to the asbestos (the extent of which is to be determined in accordance with a risk assessment) will be suspended until the asbestos material is removed by a specialist contractor.</p> <p><b><u>Operational Phase:</u></b></p> <p>The proposed site will operate under an Industrial Emissions (IE) Licence, which it is expected will include a number of monitoring requirements for the various environmental emissions from the site.</p> <p>When the site is handed over to the PPL for operation, PPL will nominate a person whose responsibility will be, in addition to preparing the site safety statement and overseeing the preparation of the Standard Operation Procedures (SOP), to ensure that the site operates under the conditions imposed by the site IE Licence. The nominated person will carry out all monitoring, reporting and liaison with external stakeholders as to the site operations as required by the IE Licence and as per the various Chapters in this EIAR. They will make available to the public any environmental information required by The</p> | <p><b><u>Construction Phase (including Demolition)</u></b></p> <p>Considering the nature and scale of the Proposed Development to include demolition and construction of the project and the mitigation measures to be implemented, no significant negative effects on the Population and Human Health are anticipated.</p> <p>The implementation of all environmental, health and safety measures and other identified mitigation measures will ensure that there is no predicted negative residual effects on the environment in terms of Population and Human Health during the construction phases of the Proposed Development.</p> <p><b><u>Operational Phase</u></b></p> <p>There will be a long-term positive residual effect on the local community because of increased employment opportunities and social activity in the area. This will increase economic activity in the area that will attract new economic initiatives and support local businesses and amenities.</p> <p>There will be improved ambient air quality and overall improvement in the quality of life for local residences.</p> <p>The visual impact will project a very positive image enhancing the ambiance of the area making it an attractive area to live in and is likely to impact positively on the quality and value of property of the area. The Proposed Development will also lead to employment opportunities for the local community.</p> <p>There will be no negative EHS effects from the operational phase in particular those concerning the control of major accident hazards involving dangerous substances</p> |

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| Environmental Factor                       | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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|                                            | <p>European Communities (Access to Information on the Environment) Regulations 2007-2018 (AIE).</p> <p><b><u>Monitoring Requirements.</u></b></p> <p><b><u>Construction Phase (including Demolition)</u></b></p> <p>The monitoring measures that will need to be carried out by the contractor during the construction and demolition phase are detailed in the Outline Construction Environmental Management Plan which accompanies this planning application. The monitoring relevant to the risks identified in this chapter are summarised in Table 4.9 of this EIAR and reiterated below.</p> <table> <tr> <th>Key Aspect</th><th>Objective, target</th><th>How is it measured?</th></tr> <tr> <td><b>Surface Water, Groundwater and Soil</b></td><td>Protect surface water, groundwater and soil resources onsite</td><td>Site monitoring by CMT (ongoing basis).<br/>Environmental audits of site.</td></tr> <tr> <td><b>Waste</b></td><td>Ensure that best waste management practices on site are fully implemented to comply with national, regional and local regulatory requirements.</td><td>Site monitoring by CMT (ongoing basis).<br/>Environmental audits of site.<br/>Audit of waste management contractor facilities.</td></tr> <tr> <td><b>Noise and Vibration</b></td><td>Ensure that humans and wildlife are not negatively impacted by noise generated by construction works;</td><td>Complete baseline noise monitoring or monitoring of noise during works if required</td></tr> <tr> <td><b>Biodiversity</b></td><td>Ensure biodiversity, habitat is not degraded during the construction works.</td><td>Environmental auditing and site monitoring</td></tr> <tr> <td><b>Air Quality</b></td><td>Ensure that humans are not negatively impacted by dust generated by demolition or construction works</td><td>Site audits and monitoring of works. Should dust levels become high, increase mitigation measures. Should vehicles be defective, get a repair complete or removed from site.</td></tr> <tr> <td><b>Traffic</b></td><td>Ensure the local population are not affected by traffic from the project construction works</td><td>Monitored throughout the project by client and site feedback</td></tr> <tr> <td><b>Sustainability</b></td><td>           Accreditation to an applicable Code of Considerate Practice e.g. Considerate Constructors Scheme. This requires the site to:<br/>           Care about Site Presentation and Appearance<br/>           Respect its neighbors, nearby community and the general public<br/>           Minimal impact on the Environment<br/>           Secure everyone's Safety<br/>           Value their Workforce         </td><td>Certification to the relevant sustainable standard and code of Considerate Practice.</td></tr> </table> <p><b><u>Operational Phase</u></b></p> <p>As mentioned previously, when the site is handed over to the PPL for operation, PPL will nominate a person whose responsibility will be to ensure that the site operates under the conditions imposed by the site IE Licence. The nominated person will carry out all monitoring, reporting and liaison with external stakeholders as to the site operations as required by the IE Licence and as per the various Chapters in this EIAR.</p> | Key Aspect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Objective, target | How is it measured? | <b>Surface Water, Groundwater and Soil</b> | Protect surface water, groundwater and soil resources onsite | Site monitoring by CMT (ongoing basis).<br>Environmental audits of site. | <b>Waste</b> | Ensure that best waste management practices on site are fully implemented to comply with national, regional and local regulatory requirements. | Site monitoring by CMT (ongoing basis).<br>Environmental audits of site.<br>Audit of waste management contractor facilities. | <b>Noise and Vibration</b> | Ensure that humans and wildlife are not negatively impacted by noise generated by construction works; | Complete baseline noise monitoring or monitoring of noise during works if required | <b>Biodiversity</b> | Ensure biodiversity, habitat is not degraded during the construction works. | Environmental auditing and site monitoring | <b>Air Quality</b> | Ensure that humans are not negatively impacted by dust generated by demolition or construction works | Site audits and monitoring of works. Should dust levels become high, increase mitigation measures. Should vehicles be defective, get a repair complete or removed from site. | <b>Traffic</b> | Ensure the local population are not affected by traffic from the project construction works | Monitored throughout the project by client and site feedback | <b>Sustainability</b> | Accreditation to an applicable Code of Considerate Practice e.g. Considerate Constructors Scheme. This requires the site to:<br>Care about Site Presentation and Appearance<br>Respect its neighbors, nearby community and the general public<br>Minimal impact on the Environment<br>Secure everyone's Safety<br>Value their Workforce | Certification to the relevant sustainable standard and code of Considerate Practice. |  |
| Key Aspect                                 | Objective, target                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | How is it measured? 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| <b>Surface Water, Groundwater and Soil</b> | Protect surface water, groundwater and soil resources onsite                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| <b>Waste</b>                               | Ensure that best waste management practices on site are fully implemented to comply with national, regional and local regulatory requirements.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Site monitoring by CMT (ongoing basis).<br>Environmental audits of site.<br>Audit of waste management contractor facilities.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |                     |                                            |                                                              |                                                       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                                                                              |                                                              |                       |                                                                                                                                                                                                                                                                                                                                         |                                                                                      |  |
| <b>Noise and Vibration</b>                 | Ensure that humans and wildlife are not negatively impacted by noise generated by construction works;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Complete baseline noise monitoring or monitoring of noise during works if required                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                     |                                            |                                                              |                                                       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| <b>Biodiversity</b>                        | Ensure biodiversity, habitat is not degraded during the construction works.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Environmental auditing and site monitoring                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                     |                                            |                                                              |                                                       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| <b>Air Quality</b>                         | Ensure that humans are not negatively impacted by dust generated by demolition or construction works                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Site audits and monitoring of works. Should dust levels become high, increase mitigation measures. Should vehicles be defective, get a repair complete or removed from site.                                                                                                                                                                                                                                                                                                                                                                                                         |                   |                     |                                            |                                                              |                                                                          |              |                                                                                                                                                |                                                                                                                              |                            |                                                                                                       |                                                                                    |                     |                                                                             |                                            |                    |                                                                                                      |                                                                                                                                                                              |                |                                                                                             |                                                              |                       |                                                                                                                                                                                                                                                                                                                                         |                                                                                      |  |
| <b>Traffic</b>                             | Ensure the local population are not affected by traffic from the project construction works                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Monitored throughout the project by client and site feedback                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |                     |                                            |                                                              |                                                       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| <b>Sustainability</b>                      | Accreditation to an applicable Code of Considerate Practice e.g. Considerate Constructors Scheme. This requires the site to:<br>Care about Site Presentation and Appearance<br>Respect its neighbors, nearby community and the general public<br>Minimal impact on the Environment<br>Secure everyone's Safety<br>Value their Workforce                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Certification to the relevant sustainable standard and code of Considerate Practice.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                     |                                            |                                                              |                                                                          |              |                                                                                                              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| <b>Landscape and Visual</b>                | <p><b><u>Construction Phase (including Demolition)</u></b></p> <p>Construction works will be guided by the Outline Construction Environmental Management Plan (CEMP) which accompanies this planning application, which provides the environmental management framework to be adhered to, and monitored, during the works. The Outline CEMP incorporates all of the mitigation measures required to ensure that the work is carried out in a way that minimises the potential for impacts to occur to the landscape, natural heritage and visual environment.</p> <p>Monitoring of the removal and protection of trees and vegetation shall be inspected and approved by a project arborist and project ecologist. Existing trees, hedgerows and vegetation to be retained within and adjoining the works area, including along the northern boundary of the site will be protected in accordance with 'BS 5837:2012 Trees in relation to design, demolition and construction. Recommendations'. Works required within the root protection area (RPA) of trees, hedgerows to be retained will follow a project specific arboricultural methodology for such works, prepared / approved by a professional</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p><b><u>Construction Phase (including Demolition)</u></b></p> <p>There are no significant residual landscape and visual residual effects associated with the demolition and construction phase.</p> <p>The sensitivity of the wider landscape and visual environment is classified as high and the degree of change associated with the demolition and construction phase of the Proposed Development is assessed as being medium / high.</p> <p>The landscape and visual impact of the demolition and construction phase of the Proposed Development is assessed as moderate /</p> |                   |                     |                                            |                                                              |                                                                          |              |                                                                                                                                                |                                                                                                                              |                            |                                                                                                       |                                                                                    |                     |                                                                             |                                            |                    |                                                                                                      |                                                                                                                                                                              |                |                                                                                             |                                                              |                       |                                                                                                                                                                                                                                                                                                                                         |                                                                                      |  |

| Environmental Factor  | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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|                       | <p>qualified arborist. A report will be prepared by arborist at the end of the tree / vegetation removal which will detail the works completed and its compliance to BS 5837:2012.</p> <p>Construction compounds will not be located within the RPA of trees or planting to be retained.</p> <p>Within landscape areas, topsoil shall be stripped and stored separate to subsoils / other soils. Topsoil shall not be compacted during storage and shall be re-used wherever possible during reinstatement works.</p> <p>Monitoring of soil stripping, storage and reinstatement of landscape areas, shall be inspected and approved by the project landscape architect during the excavation works and the reinstatement of landscaping.</p> <p>Compound areas will be fully decommissioned and reinstated to match the existing condition insofar as possible at the end of the construction phase.</p> <p>All proposed landscape measures (as set out on landscape drawings submitted with the application), including new tree and other planting will be completed as part of finalisation of the construction phase of the Proposed Development.</p> <p><b><u>Operational Phase</u></b></p> <p>A specific integrated architectural treatment is proposed for the Proposed Development (refer to <i>Chapter 2 Description of Proposed Development</i> of this EIAR and drawings submitted with the application). These proposals will assist in the visual integration of the Proposed Development with its existing context.</p> <p>All landscape areas enhanced, provided and / or reinstated during the construction phase shall be subject to a minimum 12 month period of aftercare so as to ensure successful establishment as per the Landscape Design Report which accompanies this planning application.</p> <p>Any proposed plants, seeding or other landscape measures that die or otherwise fail within the 12 month aftercare period will be replaced to match the existing specification for same.</p> <p>Post the aftercare period the proposed landscape measures will continue to be managed as part of the on-going landscape maintenance operations for the facility.</p> <p><b><u>Monitoring Requirements.</u></b></p> <p><b><u>Construction Phase (including Demolition)</u></b></p> <p>No monitoring other than of the normal management of landscape areas is required during the operational phase.</p> <p><b><u>Operational Phase</u></b></p> <p>No monitoring other than of the normal management of landscape areas is required during the operational phase.</p> | <p>significant, temporary to short-term, direct and neutral / positive.</p> <p>No significant indirect landscape and visual impacts have been identified.</p> <p>There is no discernible difference in the assessment of the demolition and construction phase impact on the landscape and visual environment between the 'Existing Baseline Scenario' or the 'Operational Baseline Scenario'.</p> <p><b><u>Operational Phase – Existing Baseline Scenario</u></b></p> <p>Completion of the Proposed Development, including proposed landscape measures and works, will give rise to moderate to significant positive impacts on the landscape and visual environment. The removal of the existing poor quality, visually prominent industrial facility, and its replacement with a high quality development with extensive landscape measures and planting will substantially enhance the quality of the visual character and views along and across the River Boyne / Boyne Estuary, including views from surrounding residential and community areas, from open space areas, and from identified views and prospects (i.e. Boyne Valley Viaduct, Millmount, View No. 75 (County Meath)) and protected structures in the surrounding area.</p> <p>The existing industrial facility is highly illuminated at night. While night-time illumination will continue as a feature of the 24/7 operation of the Proposed Development, the extent of illumination will be reduced and significantly better screened by the change in layout and proposed landscape measures.</p> <p>The solar PV panels to be provided as part of the Proposed Development will not give rise to visual impacts (refer to the Glint and Glare Assessment (CPA Ltd. with Gyrogy Ltd.)).</p> <p>The Proposed Development includes for the provision of a railway heritage pathway and viewpoint feature. This facility will positively enhance the landscape and visual experience of the site and the panoramic nature of the vantage of the River Boyne / Boyne Estuary east of Drogheda town centre and east of the Boyne Valley Viaduct.</p> <p>The sensitivity of the wider landscape and visual environment is classified as high and the degree of change associated with the operation of the Proposed Development is assessed as being medium.</p> <p>The landscape and visual impact of the operation phase of the Proposed Development is assessed as moderate / significant, short to long-term, direct and positive.</p> <p>No significant indirect landscape and visual impacts have been identified.</p> <p><b><u>Operational Phase – Operational Baseline Scenario</u></b></p> <p>In an operational baseline scenario a general increase in activity, including in terms of traffic and shipping would be a notable feature. However, such activity is part of the long-standing operation of the site and this would not alter the findings of assessment as presented under Section 5.7.1.2 of this EIAR or elsewhere in the Landscape and Visual chapter.</p> |
| Traffic and Transport | <p><b><u>Construction Phase (including Demolition)</u></b></p> <p>Prior to the commencement of the construction phase, the contractor will produce a Construction Traffic management Plan (CTMP). The CTMP is a statutory requirement which focuses on mitigating the impacts of traffic on the surrounding environment. The contractor will produce the plan in consultation</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>The traffic-related residual effects of the Proposed Development are anticipated to be "slight".</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| Environmental Factor                     | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Residual Effects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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|                                          | <p>with the local council as well as suppliers and sub-contractors. The CTMP will focus on the following key issues:</p> <p>Maintaining free traffic flow along the local road networks.</p> <p>Ensuring all footpaths and road surfaces are always free from debris.</p> <p>Ensuring the efficient free flow of operatives entering and exiting the Proposed Development site.</p> <p>Management of imported / exported materials to ensure that all associated vehicle movements are outside of the network peaks as specified earlier in this chapter.</p> <p>Robust traffic management principles and practices will need to be enforced to ensure construction traffic does not create congestion and cause inconvenience to the adjacent tenants and the public.</p> <p>Protection to the public for the duration of the project construction phase where works are carried out in the public domain. The contractor will be required to ensure that all existing pedestrian, cycling and vehicle movements are maintained throughout the construction process.</p> <p>All deliveries will be through regional road M1 and N51. The contractor will develop a detailed Logistics Plan to identify the delivery schedule requirements. It is anticipated that the contractor will operate a “Just in Time” delivery philosophy to minimise materials stored on site and reduce congestion in and around the works compound.</p> <p><b><u>Operational Phase</u></b></p> <p>A Mobility Management Plan (MMP) has been developed to mitigate the anticipated increase in traffic volumes. Efforts will be made to utilise local public transport network, road network and active travel facilities in the most efficient ways possible that will be encouraged through appropriate cycle parking and storage facilities on the Proposed Development. Staff will be made aware about the public transport facilities nearby. The measure will also include making people aware about “Cycle to Work Scheme” and “Taxsaver Commuter Ticket Scheme”.</p> <p>In addition, the proposed buildings within the Proposed Development have been set back from the southern site boundary to ensure that the Proposed Development does not prejudice any potential future plans that Louth County Council may have for active travel routes.</p> <p><b><u>Monitoring Requirements</u></b></p> <p>No monitoring requirements are necessary for the Proposed Development.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Soils, Geology &amp; Hydrogeology</b> | <p><b><u>Construction Phase (including Demolition)</u></b></p> <p>In order to prevent potential adverse effects associated with localised ground contamination identified in shallow soils at the development site the following <u>remediation strategy</u> will be implemented as part of the Proposed Development:</p> <p>Excavation and removal off-site of localised hotspots of hydrocarbon contamination in shallow soils in the north-western and northern parts of the site in accordance with a site-specific <i>Soils Remediation Plan</i> prepared by the Environmental Consultant in advance of commencement of proposed remediation works.</p> <p>All remediation works will be supervised by an appropriately qualified Environmental Consultant and excavation works will be carried out carefully to ensure no potential for cross-contamination occurs.</p> <p>A final <i>Soil Validation Report</i> will be prepared by the Environmental Consultant to document remediation of hydrocarbon impacted soils and verify that the recommended Remedial Strategy has been fully implemented.</p> <p>A detailed <i>Asbestos Management Plan</i> (AMP) for any excavation works on the site will be developed by an asbestos consultant prior to the commencement of any demolition and remediation works and all recommended mitigation measures will be incorporated in the CEMP.</p> <p>All excavation operations shall be undertaken on the assumption that ACMs or asbestos pipework could be encountered and appropriate health and safety measures will be implemented including appropriate Personal Protection Equipment (PPE) provided to relevant site operatives working in these areas. All excavation operations in areas suspected to contain ACMs shall be supervised by an Asbestos Consultant.</p> <p>All asbestos material identified shall be carefully removed and appropriately double-bagged and safely stored on-site for off-site disposal by a suitable licenced waste haulage company to an asbestos licenced waste disposal facility.</p> <p>Other mitigation measures to prevent adverse effects on geological and hydrogeological features during construction phase, including demolition, include:</p> <p>Clean-to-Shell and demolition works will be carried out in accordance with the <i>Outline Demolition Method Statement</i> (submitted with this planning application) and a detailed <i>Clean-Out Plan</i>, which will be prepared by the Demolition Contractor ahead of commencing works. The <i>Clean-Out Plan</i> will define waste streams with quantities for removal stated. This will ensure appropriate handling and waste management of hazardous / polluting substances in order to protect soil and groundwater quality;</p> <p>In order to prevent monitoring wells acting as a conduit for contamination of groundwater, all wells located within the footprint of the Proposed Development shall be decommissioned in line with best practice (Environment Agency (2012) “Good practice for decommissioning redundant boreholes and wells”) prior</p> | <p><b><u>Construction Phase (including demolition)</u></b></p> <p>Potential effects on relevant geological and hydrogeological features during construction phase, including demolition, are assessed and described in accordance with IGI Guidance (2013) and EPA Guidance (2022) in Section 7.5.1.</p> <p>No significant adverse residual effects on relevant geological and hydrogeological features are predicted. As such, there will be no significant effects on the WFD status of the underlying groundwater bodies as a result of the construction of the Proposed Development.</p> <p><b><u>Operational Phase</u></b></p> <p>Potential effects on relevant geological and hydrogeological features during operational phase are assessed and described in accordance with IGI Guidance (2013) and EPA Guidance (2022) in Section 7.5.2.</p> <p>No significant adverse residual effects on relevant geological and hydrogeological features are predicted. As such, there will be no significant effects on the WFD status of the underlying groundwater bodies as a result of the Proposed Development.</p> |



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| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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|                      | <p>to any construction activities on site;</p> <p>Removal of hard standing will be delayed until commencement of the earthworks to minimise the period of time the ground is unprotected.</p> <p>In the event that unknown ground contamination is encountered during earthworks, excavation in the area will cease. Advice will be sought from an experienced contaminated land specialist. Contaminated soils encountered will be segregated, stockpiled and stored appropriately prior to removal off-site by licensed waste carriers and disposed of at appropriate licensed facilities.</p> <p>A <i>Materials Management Plan</i> will be prepared by the by the Environmental Consultant in advance of commencement of works for the excavation and re-use of the former waste process material at Stockpile 1, 2 and A, B and C to detail the management and sampling of the material to determine if it is unsuitable for disposal in the licenced onsite landfill. The document will include method statements for excavating, segregating, sampling, temporary stockpiling (as required), and for any material deemed unsuitable for disposal within the licenced onsite landfill, a register of all proposed hauliers and disposal facilities.</p> <p>In accordance with the outline CEMP included in this planning application, appropriate risk management measures will be implemented (e.g. stockpiling good practice including basal protection, bunding, cover systems, management of leachate water, capping layers).</p> <p>The deposition of materials in the landfill will be carried out in accordance with the site's IE Licence and the <i>Landfill Operational Plan</i> agreed with the EPA. A sampling programme according to the site-specific <i>Materials Management Plan</i> will be implemented to verify that the excavated material is suitable for placement within the onsite landfill. After reshaping, the landfill will be capped according to the <i>Closure Restoration and Aftercare Management Plan</i> (OCM, 2017) agreed with the EPA.</p> <p>Re-profiling and capping of the landfill will be completed such that the finished slopes of the landfill are structurally stable and resistant to erosion.</p> <p>Re-use of appropriate site won material will be maximised. Material will be re-used during earthworks to achieve formation levels, as capping of the landfill and as part of landscaping works. Any surplus clean excavated material that cannot be reused on site would be removed by licensed waste carriers and sent for disposal/recovery at appropriately licensed facilities in line with the outline <i>Resource and Waste Management Plan</i> (RWMP) submitted with this planning application.</p> <p>A final <i>Soil Management Report</i> will be prepared by the Environmental Consultant to document the scope of works undertaken, volume of material moved (and from where), relevant material testing results, and details of any material deemed unsuitable for re-use, including volumes and disposal destinations etc</p> <p>Standard mitigation measures detailed in the outline CEMP included in this planning application in relation to hazardous / polluting materials to protect soil and groundwater quality (e.g. bunding) will be implemented:</p> <ul style="list-style-type: none"> <li>- Mobile plant / vehicles will be refuelled on a hard stand refuelling area.</li> <li>- Fuels / chemicals will be stored in bunded areas and their location will take into account features such as drain systems. Spill kits will be maintained near to fuel / chemical storage and refuelling areas.</li> <li>- Vehicle washdown water will be recovered and recycled and will be tankered off-site weekly for final disposal/treatment by a licensed waste contractor.</li> <li>- Raw or uncured waste concrete will be collected and disposed of in an appropriate manner. Any concrete delivery trucks coming to the site to deliver concrete will only wash out their trucks at their own company depots.</li> </ul> <p><b>Operational Phase</b></p> <p>Mitigation measures to prevent adverse effects on geological and hydrogeological features during the operational phase include:</p> <p>As detailed in the Civil Engineering Planning Report included in this planning application, firewater run-off retention capacity, which automatically shuts off the outfall during a fire event, will be installed as part of the redevelopment works preventing loss of potentially contaminated fire water run-off to ground in the event of a fire.</p> <p>All hazardous storage areas will be, as a minimum, bunded, either locally or remotely, to a volume not less than the greater of 110% of the capacity of the largest tank or drum within the bunded area; or 25% of the total volume of substance that could be stored within the bunded area.</p> <p>As required by the site's IE Licence, an Environmental Management System (EMS), incorporating a set of measures / practices to minimise environmental impact, will be implemented at the Proposed Development and will include site maintenance which will involve integrity testing of drainage systems and secondary containment bunds as well as spill response management procedures.</p> <p>In line with the <i>Closure Restoration and Aftercare Management Plan</i> (OCM, 2017) as approved by the EPA, landfill aftercare will include routine monitoring of groundwater and surface water quality for at least 10 years post closure of the landfill. In the unlikely event that adverse effects are detected, further investigation will be completed and a remedial strategy will be devised and implemented in agreement with the EPA.</p> <p><b>Monitoring</b></p> |                  |

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| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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|                      | <p><b><u>Construction Phase (including Demolition)</u></b></p> <p>Prior to commencement of demolition works on-site the groundwater monitoring wells will be sampled and analysed for contaminants to establish baseline conditions. The wells will be monitored and sampled periodically during the demolition and construction works to identify any effect the works may have on the local groundwater quality. Groundwater Monitoring Reports will be prepared by the Environmental Consultant to document analytical results and trends.</p> <p>In line with current EPA licence requirements, groundwater monitoring of wells located in the landfill area (MW-1, MW-2, MW-3 and AGW-2) will be completed on a biannual basis.</p> <p><b><u>Operational Phase</u></b></p> <p>During the operational phase of the development, it is anticipated that routine groundwater monitoring will recommence with groundwater samples collected from 10 no. groundwater monitoring wells, as per current EPA licence requirements. It is also anticipated that the parameters analysed, compliance limit values and monitoring frequency of the groundwater monitoring programme currently in place at the PPL site will continue to apply.</p> <p>Any reduction in the scope of the monitoring programme to reflect the changes in site condition and site activities following redevelopment will be subject to agreement with the EPA under revision of the existing licence or under a new IE Licence, as appropriate. However, as part of landfill aftercare management, routine monitoring of groundwater quality at wells MW-1, MW-2, MW-3 and AGW-2 will continue for a period of at least 10 years post closure of the landfill.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Biodiversity         | <p><b><u>Construction Phase Mitigation</u></b></p> <p><b>European Sites</b></p> <p><b><u>Habitat Degradation – Surface Water Quality</u></b></p> <p>The Hydrological Risk Assessment outlines appropriate mitigation measures for the demolition and construction of the Proposed Development (SLR Hydrological Report assessment accompanying this planning application). The following mitigation measures were developed to address potential impacts that were identified during decommissioning, demolition, and construction of the Proposed Development.</p> <p><b><u>Measures to Protect Surface Water Quality during Decommissioning and Demolition</u></b></p> <p>This section presents the mitigation measures that will be implemented during Demolition and decommissioning to avoid the potential impacts of the Proposed Development on downstream European sites. All of the mitigation measures discussed below will be implemented in full. They are in accordance with best practice, and tried and tested, effective control measures to protect the receiving environment.</p> <p>The following proposed measures will be implemented during the demolition phase :</p> <p>All demolition and construction works will be carried out in accordance with the Construction Environmental Management Plan (CEMP) and Demolition Method Statement [AtkinsRéalis Report No. BEC231-ATK-A01-ZZZZ-XX-RP-EV-000003] which will reiterate those measures included in the NIS and EIAR chapters, to ensure that any contaminants resulting from the removal, dismantling, excavation, or construction will not enter the surface water or groundwater</p> <p>The CEMP has been prepared and includes all mitigation in respect of the NIS and EIAR for Biodiversity implementation taking into account relevant good site practice with respect to the handling of potentially contaminated material, which will be enforced and monitored throughout the demolition phase. This is to include both a surface water and groundwater protection management plan;</p> <p>additional site investigation including soil and groundwater has been undertaken to identify and assess potential contamination sources . Following the ground investigation, a generic quantitative risk assessment (AtkinsRéalis GQRA, 2024) has been prepared and is submitted as part of the planning submission. The following remediation strategy will be carried out, as recommended within the GQRA report:</p> <p>All excavation works from Stockpile 1, 2 and A, B and C will be supervised by an appropriately qualified Environmental Consultant with relevant contaminated land experience. Excavation works should be carried out carefully to allow visual screening of all material and segregation as required. A sampling programme will be implemented to verify that the excavated material is suitable for placement within the onsite landfill, and that all material deposited at the landfill, from Stockpile 1, 2 and A, B and C, fully meets the relevant landfill licence criteria. The proposed testing suite should include ACMs.</p> <p>A final Soil Management Report will be prepared by the Environmental Consultant to document the scope of works undertaken, volume of material moved (and from where), relevant material testing results, and details of any material deemed unsuitable for re-use, including volumes and disposal destinations etc.</p> <p>Following the direction of the CEMP, a Materials Management Plan will be prepared by the Environmental Consultant in advance of commencement of the proposed excavation and re-use of former waste process material at Stockpile 1 and 2, and A, B and C. This document shall provide further detail on the above preliminary management and sampling strategy. The document should also include method statements for excavating, segregating, temporary stockpiling (as required), and for any material deemed unsuitable for disposal within the licensed onsite landfill, a register of all proposed hauliers and disposal facilities. Copies of all valid National Waste Collection Permit Office (NWCPO) permits, waste facility permits, and EPA waste licences shall also be provided.</p> | <p><b><u>Construction Phase</u></b></p> <p>Following the implementation of the mitigation measures prescribed in Section 8.8, the Proposed Development will not result in any significant residual effects above the local scale on the KERs identified on its own, or cumulatively together with other Proposed and permitted developments during the Construction Phase.</p> <p>The GQRA report concludes that with the remedial works there will be no residual risk associated with the Proposed Development and no pollution linkages will remain at the site following remediation.</p> <p><b><u>Operational Phase</u></b></p> <p>Following the implementation of the mitigation measures prescribed in Section 8.9, the Proposed Development will not result in any significant residual effects on the KERs identified on its own, or cumulatively together with other Proposed and permitted developments during the Operational Phase. A summary of operational phase residual effects is presented in Table 8.15.</p> |

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| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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|                      | <p>Where site material is proposed to be segregated, screened, crushed and re-used, a Materials Management Plan (MMP) shall be developed by the appointed contractor before the commencement of construction to ensure the suitable re-use of material and the implementation of an auditable tracking system. Where required, appropriate risk management measures (e.g. regular soil testing, stockpiling good practice including basal protection, bunding, cover systems, management of leachate water, capping layers) will be incorporated into the Materials Management Plan requirements and the temporary works design as required.</p> <p>A watching brief will be implemented by the appropriate staff (environmental manager or similar) to be nominated by the appointed contractor, during the site-enabling excavation to ensure that any unexpected contamination within the made ground and around infrastructure such as drainage is rapidly identified, risk assessed and dealt with appropriately. On the completion of the works a Verification Report will be completed documenting works undertaken in accordance with the remediation strategy including material tracking, findings during the watching brief and details of import and disposal of material;</p> <p>Excavated material will be stored away from drains within the site and silt control measures put in place;</p> <p>Excavated material, where not being reused on site, will be removed off site as soon as practicable in accordance with the requirements of waste legislation;</p> <p>The Main Contractor will be responsible for the construction foundations, including the excavation and appropriate disposal of excavated material as well as the construction of the main building foundations and any piled foundations needed;</p> <p>The Main Contractor will be responsible for the management of excavated material and the safe disposal of this material to a suitably licenced waste disposal facility;</p> <p>Removal of existing hard standing at the site shall be undertaken in stages during the demolition phase, to avoid opening up the unprotected ground which could result in fluxes of mobilised contamination due to increased potential for surface water / rainwater infiltration. ;</p> <p>Direct discharge of sediment laden or contaminated water to adjacent surface water bodies will be forbidden;</p> <p>The existing storm water discharge to the River Boyne from the offices and car parking at the western end of the site will be closed off and all storm runoff during demolition and early construction phases will go to the settlement lagoon for treatment prior to discharge;</p> <p>A vehicle management system including strict speed limits and road markings will be put in place wherever possible to reduce the potential conflicts between vehicles and thereby reduce the risk of collision;</p> <p>Mobile plant / vehicles will be refuelled on a hard stand refuelling area;</p> <p>Waste oil from the site will be collected by a licensed waste management company and disposed of off- site at a licensed facility;</p> <p>An Environmental Emergency Response Plan (EERP) has been prepared and shall be finalised prior to works commencing to detail procedures in the event of the emergency release of any pollutant into a watercourse, or serious spillage of chemicals, fuel or other hazardous waste e.g. concrete;</p> <p>There are currently controls on site associated with consented discharge through the treatment plant to the monitored permitted discharge and, if an obvious spillage occurred, the discharge would be shut off prior to hydrocarbons reaching this far in the system;</p> <p>Prior to demolition works commencing, the appointed contractor will be appointed to nearby sample and monitor nearby boreholes to establish current background conditions within the local groundwater / perched water within the made ground. These same boreholes shall also be monitored and sampled during the demolition phase to monitor any effect the works may have on the local groundwater or perched water within the made ground. If there is a deterioration in water quality as a result of demolition or construction related activities then additional measures will be implemented to prevent the reduction in groundwater quality, such as alternative fuel management measures and the implementation of measures to prevent accidental leaks.</p> <p>All unrequired storm drainage removed as necessary and replace with new. Existing storm drainage may be retained in the short term to facilitate demolitions of the existing facility and its associated storm water management. Retained structures will also have their associated storm sewers retained. These measures are for the protection of local waterbodies.</p> <p>All of the above measures implemented on site will be monitored throughout the duration of construction/decommission in accordance with the terms of the CEMP and the Demolition Method Statement (DMS) to ensure that they are working effectively, to implement monitoring measures if required/applicable and to address any potential issues that may arise.</p> <p>The Demolition Method Statement [AtkinsRéalis Report No. BEC231-ATK-A01-ZZZZ-XX-RP-EV-000003] includes the following mitigation measures:</p> <p>Fuel oil for plant will be stored in double bunded tanks, their location will take into account features such as drain systems. This will ensure, in the event of catastrophic failure, released liquids will be contained locally. Spill kits will be maintained near to fuel storage and refuelling areas;</p> <p>Any chemicals will be stored in ventilated bunded areas. This will ensure, in the event of catastrophic failure, released liquids will be contained locally. Spill kits will be maintained near the storage area;</p> <p>Prior to commencing decommissioning and demolition works the existing site drainage network, including sumps and interceptors, shall be cleaned and inspected. Where necessary additional temporary drainage shall be installed to capture and control the run-off arising from the demolition works (road</p> |                  |

| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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|                      | <p>washing, dust control run-off, pipe-line cleaning etc.) in order to prevent contamination or deleterious materials entering water courses or the SAC/SPA.</p> <p>Drain points shall be identified prior to commencing and shall be managed as the works proceed to prevent flooding. Upon completion these are to be capped as required. Where it is expected that significant debris could enter the drains, they will be protected with filter material which is replaced regularly;</p> <p>During crushing activities water and dust controls will be in place.</p> <p>There will be no crushing of any demolition material at the wharf to prevent suspended sediment from going to the River Boyne.</p> <p>The GQRA Tier 2 assessment findings indicated that at the site there is a potential environmental risk has been identified from localised hydrocarbon 'hotspot' areas at the site, i.e. decommissioned fuel tanks and Stockpile no. 1, which could impact on groundwater and surface water quality.</p> <p>Proposed remediation measures were developed in the GQRA report to address these identified risks and include the following measures:</p> <p>The excavation of the shallow soils with elevated hydrocarbons and their removal offsite for disposal;</p> <p>A site-specific Soils Remediation Plan will be prepared for the required soil remediation works at the site;</p> <p>A Materials Management Plan will be prepared for the excavation and re-use of the former waste process material at Stockpiles 1 and 2 to include for the management and sampling of the material to determine if it is unsuitable for disposal in the licenced onsite landfill.</p> <p>The GQRA report concludes that with the remedial works there will be no residual risk associated with the Proposed Development and no pollution linkages will remain at the site following remediation.</p> <p>The SLR Hydrological Report assessment in support of Chapter 10 Water and Wastewater outlines the measures for the decommissioning of all wells located within the Proposed Development site and are included below.</p> <p>During demolition works, earthworks and construction works, existing groundwater monitoring wells within the development area at the site have the potential to act as preferential pathway for contaminant movement and may pose a risk to groundwater quality within the superficial deposits underlying the site.</p> <p>In order to prevent monitoring wells acting as a conduit for contamination of groundwater, it is proposed to decommission all wells located within the footprint of the Proposed Development prior to any construction activities on site. The monitoring wells located within the Proposed Development footprint include:</p> <p>Monitoring wells MW-9 and MW-11 currently monitored on a biannual basis as per EPA licence requirements;</p> <p>Monitoring well BH10178 installed in 2024 during project specific ground investigation; and</p> <p>Former monitoring wells, including AGW-1, MW-4, MW-10, MW-12 and the 'Deep Well' which are no longer part of the monitoring network at the site.</p> <p>The decommissioning of the wells will be completed by a suitably qualified well drilling contractor in line with best practice guidelines<sup>179</sup> and will include the following steps:</p> <p>Prior to decommissioning: the contractor will ensure that the well is free from all obstructions that may interfere with the sealing of the hole;</p> <p>Backfilling of the hole: In order to mimic the surrounding natural strata to the well, restoration will require a variety of materials to be used so that permeable aggregates (for example pea gravel and sand) are positioned adjacent to aquifer horizons, whilst low permeability materials (usually clay, bentonite cement grout or concrete) are positioned adjacent to low permeability horizons. Alternatively, the entire well may be backfilled with low permeability materials (such as bentonite) that will prevent the vertical or horizontal movement of groundwater through or along the borehole. All backfill materials used for the restoration will be clean, inert and non-polluting.</p> <p>Sealing of the top of the well: The restored well will be completed with an impermeable plug and cap to prevent entry of potentially contaminated surface run-off or other liquids. The top two metres will be filled with cement, concrete or bentonite grout.</p> <p>Groundwater monitoring wells located upgradient of the development (MW-8) and downgradient of the development (MW-6, MW-5 and MW-7) will be retained to allow periodic monitoring of groundwater quality during demolition and construction works and for the EPA licence requirements.</p> <p>Prior to commencement of demolition works on-site the groundwater monitoring wells will be sampled and analysed for contaminants of concern to establish the current background and baseline conditions. The wells will be monitored and sampled periodically during the demolition and construction works to identify any effect the works may have on the local groundwater quality at the wells. Groundwater Monitoring Reports will be prepared by the Environmental Consultant to document analytical results and trends.</p> <p>Similarly, groundwater monitoring wells located up-gradient of the landfill area (MW-1) and down-gradient of the Landfill Area (MW-3, MW-2 and AGW-2) will be retained to continue groundwater monitoring in line with EPA licence requirements.</p> |                  |

<sup>178</sup> Installed in April 2024, refer to Causeway Geotech (2024) Boyne Energy Campus, Ground Investigation Report, Report No. 24-0365, dated May 2024;

<sup>179</sup> Environment Agency (2012). Good practice for decommissioning redundant boreholes and wells;  
Scottish Environmental Protection Agency (2012). Good practice for decommissioning redundant boreholes and wells



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| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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|                      | <p><u>Measures to Protect Surface Water Quality during Construction</u></p> <p>In addition to the mitigation measures outlined above for the demolition phase, the following measures will be implemented for the construction phase,</p> <p>On-Site WaterCourse Protection:</p> <p>Where required, a set-back distance of 7m (from the kerb line) will be maintained from the adjacent River Boyne during the construction works.</p> <p>Temporary silt fences/covers will be put in place between the construction site and any nearby water features (such as the leased wharf) for the duration of the construction works.</p> <p>It is proposed to provide the site with a new storm sewer system which will be both gravity-fed and pumped due to the topographical nature of the site. The overall strategy is to direct stormwater from the central part of the site towards the sand hole to the south, from where the water will be pumped across the site using a duty/standby pump arrangement to the final settlement pond to the east of the site before being pumped over the weir outfall towards the offshore discharge into Irish Sea. The new storm sewer system shall incorporate flows from the existing storm line from an old factory to the north into the proposed storm network.</p> <p>The new site storm drainage network will include SuDS features such as rainwater harvesting, vortex controls, permeable paving, swales, tree pits, and attenuation tanks with flow controls; and</p> <p>An attenuation/soakaway will be installed close to the location where the drainage leaves the site at the main site entrance. The soakaway will be sized to accommodate a 100yr. rainfall event including 20% climate change factor of safety to provide for attenuation. The water will be allowed to infiltrate to the ground. An overflow will be provided connected to the existing outfall for cases where the inflow exceeds the 100yr rainfall events. The overflow will be controlled by the existing "Hydro International Downstream Defender". The hydrocarbon separator will be located before the infiltration/soakaway area to protect groundwater and surface water.</p> <p>Excavation and Infilling:</p> <p>Excavated materials are to be visually assessed for signs of possible contamination such as staining or strong odours before stockpiling. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of possible contaminants to ensure that historical pollution has not occurred. Should it be determined that any of the excavated material is contaminated, that will be dealt with appropriately as per the Waste Management Act of 1996 (as amended) and associated regulations.</p> <p>All paved areas shall be kept clear of earth material and debris. The site shall be maintained to prevent sediment laden run-off from migrating of site and into the storm drainage system.</p> <p>Stockpile Storage:</p> <p>All existing clean soil from excavations, clean crushed concrete, and other stockpiles will be positioned at a distance 35m to 60m from sensitive watercourses in accordance with the IFI 2020 guidance<sup>180</sup> Existing stockpiles present on site will be used as fill material or other uses once the End of Waste certification is received from the EPA.</p> <p>Concrete Waste Water:</p> <p>If offsite disposal of concrete wash water is required, the contractor must make provision for removal and disposal of any concrete wash water, by means of transfer off-site by an approved waste contractor to a facility licenced to treat/accept such waste. The relevant waste records must be provided to the Environmental Officer. No such waters are to be discharged to surface water/groundwater under any circumstances. Any concrete wash activities should be limited to the cleaning the concrete truck chute only.</p> <p>Where required, the pouring of concrete must take place using a geosynthetic material to prevent concrete runoff into the soil/groundwater media.</p> <p>In-situ concrete casting will be fully controlled to ensure that cement bound materials do not present any pollution risk. Trucks, mixers, and concrete pumps that have contained concrete will be washed out in a designated impermeable area to prevent pollution.</p> <p>Washout water will be stored and disposed of in line with the existing industrial emissions licence.</p> <p>No on-site batching will be permitted at the proposed works areas. Concrete will instead be transported to the site within a concrete truck. It will be ensured that covers are available for freshly poured concrete to avoid wash off in the event of rain. Waste concrete slurry will be allowed to dry and taken to a licensed waste depot for disposal.</p> <p>Concrete works will, in as far as is practical, be scheduled during dry weather conditions to reduce the elevated risk of runoff.</p> <p>Prevention of Accidental Spills and Leaks:</p> <p>All fuel, chemicals and lubricants will be stored on hard standing in the staging area that will be protected with designated drainage and equipped with a</p> |                  |

<sup>180</sup> Inland Fisheries Ireland (2020) Planning for watercourses in the urban environment Accessed on: <https://www.fisheriesireland.ie/sites/default/files/migrated/docman/IFIUrbanWatercoursesPlanningGuide.pdf>



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| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Residual Effects |
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|                      | <p>class 1 interceptor of suitable size.</p> <p>bulk chemicals or oil and fuel storage will be stored in bunded areas. All refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in the designated part of the staging area.</p> <p>Spill kits will be made available to all machinery and in designated areas at all times. Spill kits will be kept in all machines on the site and a large spill kit shall be made available in the site stores.</p> <p>Any hazardous waste residuals or potentially contaminated sludge from spill clean-up must be stored within appropriate metal or plastic containers in temporary bunded storage areas in the construction compounds prior to removal by an approved permitted/licensed waste management contractor for off-site treatment/recycling/disposal.</p> <p>Where mobile equipment is required e.g. generators, these will be housed in a suitably sized bund / plant nappy such that any leaks / spills are intercepted.</p> <p>All waste fuels, oils, and other hazardous wastes will be disposed of in accordance with the requirements of waste legislation.</p> <p>Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and at key/sensitive and clearly identified areas and operators will be fully trained during induction to site in the use of this equipment.</p> <p>Should use of a spill-kit be required it shall be immediately re-stocked.</p> <p>Groundwater or Surface Water Pollution from prior use:</p> <p>In the event that further ground contamination is encountered beneath the site during the enabling, demolition or construction works, excavation / ground works in the area of identified contamination will cease. Advice will be sought from an experienced contaminated land specialist and a phased environmental risk assessment (specifically to assess any associated potential environmental and/ or human health risks) will be undertaken in accordance with relevant EPA guidance 'Guidance On The Management Of Contaminated Land And Groundwater At EPA Licensed Sites' (EPA, 2013) and UK Environment Agency Guidance 'Land contamination risk management (LCRM)' (UK EA, 2023). An updated GQRA will be prepared by an experienced contaminated land specialist based on the findings of the risk assessment.</p> <p>Surface Water Management:</p> <p>Generation of silt-laden water run-off (and dust) from the stockpiles will be prevented through the use of covers and silt fences.</p> <p>In respect of fuels etc, that could accidentally enter unattenuated the surface water drainage, the following measures are proposed:</p> <p>Surface water runoff will be treated in accordance with Ciria C750 Groundwater Control – Design and Practice.</p> <p><u>Habitat Degradation – Groundwater</u></p> <p>The following mitigation measures which have been prescribed in the SLR hydro assessment accompanying this planning application in support of <i>Chapter 10 Water and Wastewater</i> - and are applicable will be implemented with regard to pollution of soil and groundwater:</p> <p>All demolition and construction works will be carried out in accordance with the Construction Environmental Management Plan (CEMP) which will reiterate those measures included in the NIS and EIAR chapter, to ensure that any contaminants resulting from the removal, dismantling, excavation, or construction will not enter the surface water or groundwater.</p> <p>The CEMP has been prepared which includes all mitigation in respect of the NIS and EIAR for Biodiversity implementation taking into account relevant good site practice with respect to the handling of potentially contaminated material, which will be enforced and monitored throughout the demolition phase. This is to include both a surface water and groundwater protection management plan.</p> <p>Mitigation measures prescribed above for surface water are applicable to groundwater.</p> <p>For concrete waste water;- See measures listed above for concrete waste water during surface water protection as same measures apply for groundwater.</p> <p>Additional mitigation measures to protect groundwater quantity and quality during the Construction Phase are also outlined in the CEMP.</p> <p><u>Habitat Degradation – Air Quality</u></p> <p>The mitigation measures relating to the containment of dust emissions during construction are prescribed in Chapter 11 Air Quality of this EIAR. These include;</p> <p>Standard good practice construction measures, such as water spray, atomisers etc. will be implemented to minimise the generation of dust. It will be a requirement to ensure sufficient dust control measures are in place during this phase;</p> <p>Works will only be carried out subject to an agreed and approved method statement;</p> <p>Water Cannons and dust buster units will be used during demolition activities;</p> <p>All structures will undergo internal wash down prior to demolition;</p> |                  |

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| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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|                      | <p>All construction vehicles will be driven on existing site roads and areas of hard standing and consequently will not transport mud or earth during movement;</p> <p>Internal site roads will be kept damp during dry periods;</p> <p>Concrete crushing facilities will be setup at locations away from sensitive areas and strictly controlled with dampening down;</p> <p>Wheel washing facilities will be in place for vehicles leaving site;</p> <p>External roads next to the site exits will be kept clean using road washer vehicles;</p> <p>All demolition and most of the construction work will be carried out within the confines of the existing production site;</p> <p>Vehicles using site roads will have their speed restricted, and this speed restriction will be enforced rigidly;</p> <p>Loose materials that are transported on or off site will be properly contained;</p> <p>Potentially dusty material being removed from the site will be transported in covered trucks, where the likelihood of emitting dust is high, and during dry weather conditions, the area of removal will be sprayed with a mobile tanker on a regular basis to control dust emissions;</p> <p>The Construction Management Team (CMT) will carry out regular inspections of all trucks and will be required to record any incidents or situations where adequate cleanliness is not achieved. The registration numbers of all trucks will be maintained by the contractor and this will ensure traceability;</p> <p>If cement is stored in a silo on site, a filter will be fitted to the silo; alternatively, ready-mix concrete will be supplied for just-in-time delivery;</p> <p>Good housekeeping and site management will be observed including the proper storage of spoil / loose materials on site;</p> <p>During dry periods, use of dust-dampening techniques (water dampening of dust on roads, use of low speed limits onsite, use of covers on dusty materials during transport and storage);</p> <p>Generation of silty water run-off (and dust) from the stockpiles will be prevented through the use of covers and silt fences;</p> <p>Exhaust emissions from construction plant and equipment operating within the site, including trucks, excavators, diesel generators and compressors, will be controlled by the contractor by ensuring that the equipment is well maintained and is operated in accordance with normal good practice.;</p> <p>All vehicles and combustion equipment will undergo appropriate inspection and maintenance to ensure proper functioning;</p> <p>Sweeping of hard road surfaces;</p> <p>Provision of a water bowser on site, regular spraying of haul roads;</p> <p>Public roads in the vicinity will be inspected and kept clean;</p> <p>Material stockpiling will be provided with adequate protection from the wind;</p> <p>Existing boundary screening planting will be retained until the newly planted hedgerow are established reducing of dust emanating Proposed Development.</p> <p>The following specific mitigation measures will be implemented for the demolition of the existing conveyor structure associated with the existing quay facility (wharf) that is directly adjacent to the River Boyne (and also the River Boyne &amp; River Blackwater SAC):</p> <p>the conveyor belt will undergo a wash down prior to demolition,</p> <p>water Cannons and dust buster units will be used through demolition of the conveyor belt,</p> <p>covers and silt fences will be used to capture potential sedimentation from run-off water generated during wash-down/demolition of the conveyor belt, and temporary dust screening will be in place during demolition of the conveyor structure.</p> <p>Dust monitoring units will be required to be in place at various locations on the site boundary perimeter during the construction phase.</p> <p>Regular inspections and audits of the construction activities will be carried out by the CMT to ensure that all mitigation measures outlined in this EIAR and the accompanying CEMP have been implemented in full.</p> <p><u>Habitat Degradation – Non- Native Invasive Plant Species</u></p> <p>As previously mentioned, although no Third Schedule non-native plant species were identified on site, the risk of accidentally introducing these species to the site by way of construction vehicles entering the site and the capping of the landfill, cannot be ruled out. Therefore, precautionary mitigation measures are required to prevent the introduction of, and potential spread of any third schedule invasive species on site. These measures include:</p> <p>A preconstruction confirmatory survey to check for the establishment of Third Schedule invasive species will be undertaken by a suitably qualified specialist to confirm the presence/absence and/or the extent of all third schedule invasive species within the Proposed Development site</p> <p>If Third Schedule invasive species are confirmed on the Proposed Development site during the pre-construction confirmatory survey, this will require the implementation of an Invasive Species Management Plan (ISMP), to be prepared by a Specialist with knowledge of treating Invasive Species;</p> |                  |

| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Residual Effects |
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|                      | <p>The ISMP will provide a detailed description of the infestations (e.g., approximate area of the respective colonies (m2), where feasible; approximate total number of stems, pattern of growth and information on other vegetation present), and where necessary, include calculations of volumes of infested soils to be excavated;</p> <p>If and where an infestation is confirmed or identified on site, any works within 7m buffer (the typical underground extent of Japanese knotweed) of the infestation will halt until such time the appointed contractor and their invasive species specialist prepare an ISMP for its management and or eradication. Depending on the methodology, and post treatment monitoring, this may extend into the Operational Phase of the site.</p> <p>In addition to the ISMP, where required, general site measures shall include:</p> <p>Wheel washing of any vehicles entering the site during construction</p> <p>Soil and other capping material brought onto site from another area will be verified by the soil producer to be free from foreign objects including third schedule invasive species.</p> <p><u>National Sites</u></p> <p>The mitigation measures in relation to potential impacts arising from the Proposed Development on pNHAs within the Zol, are as per those for European sites where the boundaries coincide with the SACs and SPAs. Therefore, the mitigation measures outlined in the CEMP and the SLR hydro assessment in support of <i>Chapter 10 Water and Wastewater</i> and the SLR Hydrological Report and as detailed in the NIS, will prevent the Proposed Development resulting in a significant effect on these pNHAs at the national geographic scale.</p> <p><b>Habitats</b></p> <p><u>Landscape design and Construction</u></p> <p>Given the nature of the modified site, the majority of the habitats are valued as being 'Local Importance-Lower Value' Most of these area will be built upon, or in the case of bare ground capped and vegetated. The proposed landscape design is included in this planning application.</p> <p>There are areas, largely around the perimeter of the Proposed Development site that are being retained (or in the case of the existing <i>Leylandii</i> screening treeline, will at later stage be removed after the successful establishment of new native hedgerow to screen the site.</p> <p><u>Habitat Degradation – Surface Water Quality</u></p> <p>Measures to protect surface water are described fully above in section 8.8.1 and in the SLR Hydrological Report accompanying this planning application.</p> <p><u>Habitat Degradation – Groundwater</u></p> <p>Measures to protect groundwater during construction are described fully above in section 8.8.1 and in the SLR Report accompanying this planning application.</p> <p><u>Habitat Degradation – Air Quality</u></p> <p>Measures to protect Air Quality are described fully above in section 8.8.1 and in <i>Chapter 11 Air Quality</i>.</p> <p><u>Habitat Degradation – Non- Native Invasive Plant Species</u></p> <p>Measures to prevent the spread of non-native invasive plant species are described fully above in section 8.8.1 and apply to habitats within the Proposed Development site.</p> <p><b>Bats</b></p> <p><u>Protection of Bats during Vegetation Clearance</u></p> <p>All bat species and their roost sites are strictly protected and it is an offence to kill a bat or to damage or destroy the breeding or resting place of any bat species, and it is not necessary that the action should be deliberate for an offence to occur. This puts an onus of due diligence on anyone proposing to carry out works that might result in such damage or destruction. Under Section 54 of the Birds and Habitats Regulations, a derogation may only be granted by the Minister where there is no satisfactory alternative, and the derogation is not detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range.</p> <p><u>Roost Loss</u></p> <p>There are no known roosts within the Proposed Development. Thus, there is no requirement for a Derogation licence from NPWS. Surveys carried out to assess the suitability of trees for bat roosting potential recorded no suitability in any tree on site. due to the possibility of trees weathering over time and new roost features emerging, as a precaution the removal of any trees should occur only between April – May, and September – October to avoid the most sensitive time periods for bats (i.e. during breeding season and hibernation). However, if the project timeframe does not allow for this and to ensure the protection of bats, the following mitigation will be undertaken.</p> <p><u>Pre-felling Survey for trees</u></p> <p>It is recommended that a pre-construction survey of trees indicated for removal is undertaken. If any PRFs are identified, then the following is</p> |                  |

| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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|                      | <p>recommended.</p> <p>In advance of any clearance, all trees deemed to contain PRFs which are subject to felling / clearance will be checked for the presence of bats by a suitably qualified / licensed bat specialist (using an endoscope);</p> <p>In the event that bats are found on the Proposed Development site during construction works such as vegetation clearance, works will immediately cease in that area and the local NPWS Conservation Ranger will be contacted;</p> <p>An application will then be made to the NPWS for a derogation licence seeking to permit actions affecting bats or their roosts that would normally be prohibited by law;</p> <p>After licence approval from the NPWS (which may include the necessity for additional mitigation measures to those recommended here) bats may be removed by a bat specialist licensed to handle bats and released in the area in the evening following capture; and</p> <p>Only then may PRF trees be felled, in the appropriate season, and this should be undertaken 'in sections' where the section can be handled to avoid sudden movements or jarring of the sections.</p> <p><u>Habitat Loss and Fragmentation</u></p> <p>Where practicable, habitats of importance to bats such as scattered trees and parkland, treeline and hedgerow habitat types, which lie within the footprint, or along the boundary of the Proposed Development, that are not directly impacted by the Proposed Development will be retained. These areas will be protected for the duration of construction works, and fenced off at an appropriate distance where they may be proximal to significant works or areas for where spoil may be deposited/stored. Vegetation to be retained is shown on the Landscaping drawings accompanying this planning application.</p> <p><u>Disturbance of Flight Patterns / Foraging Routes as a result of Lighting Impacts</u></p> <p>The construction phase lighting design has been cognisant of the following to reduce light spill and will include the following measures:</p> <p>All site lighting except security lighting will be turned off during non-working hours</p> <p>Security lighting to be fitted with shields and cowls to reduce light spill.</p> <p>No additional mitigation measures are necessary.</p> <p><b>Badger</b></p> <p>Badger, and their breeding and resting places, are protected under the Wildlife Acts and it is an offence under that legislation to intentionally kill or injure a badger or to wilfully interfere with or destroy their breeding or resting places (setts).</p> <p><u>Disturbance / Displacement</u></p> <p>There were no confirmed badger setts located within the Proposed Development site as recorded during surveys of accessible lands. Therefore, there is no potential for the permanent loss of any badger sett to occur. However, badger could potentially establish new territory within the ZoI of the Proposed Development. Therefore, a preconstruction survey will be undertaken no less than 12 months in advance of commencement of construction.</p> <p>The presence of any new setts or significant badger activity will be treated and / or protected in accordance with the <i>Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes</i> (NRA 2005), and as advised by an ecologist with experience of implementing a badger mitigation strategy.</p> <p><u>Loss of Habitat</u></p> <p>While the majority of the site is considered of limited foraging value to badger, there are areas in which badger could roam e.g. revegetated spoil heaps and peripheral landscape planting (<i>Leylandii</i>). The concentration of badger activity was noted at in the northern area of scrub, that is being retained.</p> <p>In order to minimise Construction impacts, this area within the site boundary (towards the construction area) will have mammal proof fencing installed, following the specifications in the NRA 2005 guidance. This will ensure that badger coming from the wider agricultural landscape can utilise this area unhindered, and without fear of significant potential for disturbance nor mortality impact from the adjacent construction site.</p> <p>Once operational, this area will be retained, although a pedestrian trail may be installed. Fencing may be removed post construction, as the operational phase imposes no likely threat to the badger population subject to a post construction survey and advice from an ecologist.</p> <p><u>Protection of Badgers from Accidental Harm During Construction (Excavations)</u></p> <p>Uncovered deep excavations could be potentially hazardous for badgers commuting / foraging in the area. Badgers could fall into these excavations, becoming trapped and potentially hurt and distressed.</p> <p>The installation of mammal-proof fencing should be sufficient to protect badger from accidental harm during construction, and the covering of deep excavations is an additional measure, that may be required as a result of the findings of the pre-construction survey to ensure no harm to the local badger population.</p> <p>To protect badgers from indirect harm during construction, where practicable, open excavations will be covered when not in use and backfilled as soon as</p> |                  |

| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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|                      | <p>practicable by the appointed contractor. Excavations will also be covered at night, and any deep excavations which must be left open will have either appropriate egress ramps in place to allow mammals to safely exit should they fall in or be fully fenced off to discourage entrance by badger.</p> <p><u>Lighting</u></p> <p>To reduce the impact of lighting on local badger population in these retained vegetated areas during the construction period, all site lighting except security will be turned off during non-working hours and security lighting will be fitted with shields and cowls.</p> <p><b>Otter</b></p> <p><u>Habitat Degradation/Reduced Prey Availability – Water Quality</u></p> <p>In terms of mitigation of water quality, see Section 8.8.1 (and the SLR Hydrological Report accompanying this planning application) which details control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the Construction Phase of the Proposed Development.</p> <p><u>Lighting</u></p> <p>To reduce the localised impact of lighting on otter within the River Boyne and where night works are required, the lighting design including security lighting will ensure that no excessive lighting will be placed near, nor aimed at the River Boyne and that any new light spill e.g. that over and above existing illumination (long established) does not spill over the watercourse.</p> <p><b>Marine Mammals</b></p> <p><u>Habitat Degradation/Reduced Prey Availability – Water Quality</u></p> <p>In terms of mitigation of water quality, see Section 8.9.1 (the SLR Hydrological Report accompanying this planning application) which details control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the Construction Phase of the Proposed Development</p> <p><b>Other Mammals</b></p> <p>No other protected mammal species were recorded during the multidisciplinary surveys carried out along the Proposed Development. The Construction Phase of the Proposed Development is not deemed likely to affect the local populations of other small, protected mammal species including the highly mobile Hare and will not result in a significant negative effect, at any geographic scale. No additional mitigation is proposed.</p> <p><b>Breeding Birds</b></p> <p><u>Habitat Loss and Fragmentation</u></p> <p>Many breeding bird species may not nest near the Proposed Development site due to disturbance (e.g., and the relative lack of suitable vegetation in the interior of the site. Whilst the planting will not fully offset the loss of open ground (due to it being built upon) it is likely that the Proposed Development will in the longer terms provide additional foraging habitat for some species.</p> <p>There will be the permanent loss of habitat in the area of scrub at the northwestern boundary (3457 m<sup>2</sup>) the majority of suitable habitat on site will be retained, and with the implementation of the landscaping plan (native hedgerows and wildflower meadows) this will over time enhance foraging and breeding opportunities for common bird species.</p> <p><u>Mortality Risk</u></p> <p>Where practical, vegetation removal (e.g., hedgerows, trees, scrub, bankside vegetation and grassland) will not be undertaken between the 01 March and the 31 August, to avoid direct impacts on nesting birds.</p> <p>Where the construction programme does not allow this seasonal restriction to be observed, then these areas will be inspected by a suitably qualified ecologist as engaged by the appointed contractor, for the presence of breeding birds prior to clearance.</p> <p>Areas found not to contain nests will be cleared within three days of the nest survey, otherwise repeat surveys will be required. Vegetation clearance will not commence where nests are present, works will resume when birds have fledged and nests are no longer in use.</p> <p><u>Disturbance and Displacement</u></p> <p>Similar to the requirements provided above in terms of reducing mortality risk, vegetation clearance undertaken in the appropriate time (i.e. outside of the breeding bird season) should ensure that breeding birds have adequate time in which to identify alternative vegetation in which to establish nests.</p> <p>To minimise disturbance and/or displacement to breeding birds from noise and vibration activities the relevant mitigation measures as described in Chapter 9 Noise &amp; Vibration and the NIS (Scott Cawley Ltd., 2024b) will be implemented by the appointed contractor. Noise baffling screening reduces noise spill to adjacent areas of open ground.</p> <p>There is no statutory guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Local authorities normally control construction activities by imposing limits on hours of operation and have also included conditions to limit noise levels to those in</p> |                  |



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| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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|                      | <p>BS 5228-1:2009+A1:2014 Code of Practice for noise and vibration control on construction and open sites.</p> <p>The demolition and construction phases of the development has the potential to cause an increase in noise levels in the immediate vicinity of the development site. However, the development contractor will be obliged to reduce as far as possible the potential noise impact of the activity. The main mitigation measures to be taken are as follows:</p> <p>Control of Working Hours. Construction noise will occur for a period of 24 months Normal construction working hours will be Monday to Saturday from 07:00hrs to 19:00hrs.. No work other than emergency work will be undertaken outside normal construction hours. Where emergency works are required these will be the subject of agreement with the Planning Authority;</p> <p>All construction equipment will be correctly operated and maintained to ensure optimal performance and minimise out of balance effects that may result in ground-borne vibration or excessive noise. Noisy equipment will be located as far as practicable from noise sensitive receptors;</p> <p>Machinery and equipment are to be appropriately maintained and operated in accordance with the manufacturer's recommendations and switched off when not in use. There will be preferable selection of plant with lower inherent potential for generation of noise and/or vibration;</p> <p>Records of equipment maintenance will be maintained on site;</p> <p>All construction equipment used will be required to comply with the relevant regulations on plant and equipment noise, namely the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulation, 1988 (SI No. 320 of 1988) &amp; Amendment Regulation, 1996 (SI No. 359 of 1996) and the European Communities (Noise Emission by Equipment of Use Outdoors) Regulations, 2001 (SI No. 632 of 2001) &amp; Amendment Regulations, 2006 (SI No. 241 of 2006);</p> <p>Minimisation of impulsive noise sources and activities, including reduction of material drop heights, minimising hammering activities, restricting rock breaking activities during morning-time hours together with regular checks during impulsive noise generating activities at the nearest noise sensitive locations such as the national schools and the nearest residential properties;</p> <p>Keeping all site access roads even to mitigate the potential for vibration from HGV movements;</p> <p>Establishing channels of communication between the principal contractor/developer, Louth County Council, Tredagh Lodge Day Care Centre, The Mill Enterprise Centre and other impacted businesses or residents.</p> <p><b>Wintering Birds</b></p> <p>Following on from the assessment presented in the NIS (Scott Cawley Ltd., 2024b) and as noted previously in this chapter, there will be no direct loss or fragmentation to any wintering bird habitat including <i>ex-situ</i> habitat as a result of the Construction Phase of the Proposed Development</p> <p><u>Disturbance and Displacement</u></p> <p>In terms of mitigation see section 8.8.4 breeding birds as same mitigation measures apply for wintering birds.</p> <p><u>Habitat Degradation – Surface Water Quality</u></p> <p>In terms of mitigation, see measures outlined in section 8.8.1 and the CEMP accompanying this planning application which details control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the Construction Phase of the Proposed Development. Specific mitigation measures which the appointed contractor will implement in relation to surface water quality are described in the SLR hydro assessment accompanying this planning application in support of <i>Chapter 10 Water and Wastewater</i>.</p> <p><b>Reptiles</b></p> <p>No reptile species were recorded during the multidisciplinary surveys carried out along the Proposed Development. The Construction Phase of the Proposed Development is not deemed likely to affect the local reptile population and will not result in a likely significant negative effect, at any geographic scale. As such, no specific mitigation is proposed.</p> <p><b>Amphibians</b></p> <p>No amphibians were noted on site and the potential for same was limited, However, standing water in open ground can be used by amphibians. For this reason, the surface water design mitigation details control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the Construction Phase of the Proposed Development. As such, no specific mitigation is proposed.</p> <p><b>Fish</b></p> <p>As no dedicated fish surveys were carried, no fish were recorded, nor is there potential for them to occur within the Proposed Development site. However the response from IFI (included in Attachment 1.1) outlines the importance of the River Boyne as a commuting pathway for migratory Salmonids, European eel, and sea Lamprey. Atlantic Salmon and River Lamprey are QI species for the River Boyne and River Blackwater SAC (freshwater stretches) further upstream also. Mitigation measures are discussed in section 8.8.1 in relation to surface water quality and relate directly to mitigation measures for fish species.</p> |                  |

| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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|                      | <p><b><u>Operational Phase Mitigation</u></b></p> <p><b>European sites</b></p> <p>The mitigation measures that are specifically required to ensure that the Proposed Development will not adversely affect the integrity of the European sites within the ZoI are presented in the NIS (Scott Cawley Ltd., 2024b). Following a consideration and assessment of the Proposed Development on the identified relevant European sites</p> <p><b>National Sites</b></p> <p>The mitigation measures in relation to potential impacts arising from the Proposed Development on pNHAs within the ZoI are as set out for European sites as the boundaries of the pNHAs follow those of the SACs and SPAs. Therefore, the mitigation measures outlined in Section 8.8.1 and as detailed in the NIS (which accompanies the application), will likewise prevent the Proposed Development resulting in a significant negative effect on these pNHAs and NHAs.</p> <p><b>Habitats</b></p> <p><b><u>Landscape design</u></b></p> <p>The landscape design included in this planning application includes a number of measures to maintain when feasible and where possible to enhance the habitats on site. Treelines, hedgerows, and areas of scrub are to be retained and protected at a number of areas around the site. The design includes proposals for the planting of standard and semi-mature trees to screen and infill planting mixes as well as areas of proposed biofiltration tree planting. Other planting proposals include wetland, groundcover, screen woodland, and native infill whip planting, as well as species rich grasslands and green walls. The species proposed include a diverse mix of native trees including Common alder <i>Alnus glutinosa</i>, Hazel <i>Corylus avellana</i>, goat willow <i>Salix caprea</i>, Hawthorn <i>Crataegus monogyna</i>, Blackthorn <i>Prunus spinosa</i>, Holly <i>Ilex aquifolium</i> and Scots Pine <i>Pinus sylvestris</i> as well as a diverse mix of native shrubs, grasses, sedges, and wildflowers. All works will be carried out in accordance with the landscaping mitigation measures set out in this EIAR.</p> <p><b><u>Habitat Degradation – Surface Water Quality</u></b></p> <p>The Hydrological Risk Assessment outlines appropriate mitigation measures for the Operational Phase of the Proposed Development (SLR Hydrological Report accompanying this planning application).</p> <p>Apart from related site preparation activities discussed above for the Demolition and Construction Phases, activities in the Operational Phase with potential impacts on the water environment include:</p> <p>leakage/spillage of hydrocarbons or other chemicals from operational machinery or storage into the subsurface or site runoff;</p> <p>firewater discharge in the event of an incident.</p> <p>In addition to the relevant mitigation measures outlined above for the demolition and construction phase, the following measures will be implemented for the operational phase, these are mitigation by avoidance and prevention:</p> <p>any hydrocarbon or chemical spillages will be directed to the foul drainage network and then subsequently through to the effluent treatment system. Whilst the intended operation is that all activities involving chemicals will be completed within areas that drain to the effluent system, there could be minor spillages of chemicals or hydrocarbons / oils outside of these areas. The risks in car parking and along roadways at the site entrance with moving vehicles are considered to be mitigated by the SuDS management train including an infiltration/soakaway and hydrocarbon separator in the event of a storm overflow to the River Boyne. The hydrocarbon separator will be located before the infiltration/soakaway area to protect groundwater and surface water;</p> <p>(SuDS) in the form of swales, permeable paving, porous asphalt and storage tanks will be used onsite</p> <p>A separate foul sewer will be installed under the DC and EC to collect contaminated firewater in the event of a fire, as detailed in the Civil Engineering Planning Report (PPL Ltd., June 2024). It is proposed to pump this water to the attenuation tank/contaminated water tank under the BESS which automatically shuts off the outfall during such an event to capture the contaminated water so that it may be pumped out and removed off site in tankers. The tank is fitted with a pH-controlled actuator on the outfall and in the event of detection of contaminated water from a fire, will close the tank turning it into a firewater storage tank such that the water can be pumped out at a later stage and disposed of off-site; and</p> <p>The existing firewater retention risk assessment will be revised and updated as appropriate for the Proposed Development. Firewater retention is provided for in the design of the Proposed Development, as detailed in the Engineering Report. The sizing of the attenuation tank under the BESS area includes storage of contaminated firewater in the case of a fire inside the DC or EC. The firewater retention storage volume for the chemical storage area is designed, in line with EPA guidance, to have 110% of the capacity of the largest tank or 25% of the total volume.</p> <p>The Proposed Development currently encompasses an integrated Environmental Emergency Response Plan (EERP) (which is included in the CEMP). PPL is currently engaged in consultation with the EPA to agree the most appropriate approach to licensing to accommodate the Proposed Development (the current Reg. No. for the site is P0376-02). The EERP includes:</p> <p>Roles and responsibilities for environmental management of the site;</p> |                  |

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| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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|                      | <p>Detailed methodology for managing of materials, process water and chemicals;</p> <p>Details of site drainage and water management including inspection and maintenance regimes;</p> <p>Measures for identifying and addressing any pollution incidents should these occur.</p> <p>The Proposed Development will consist predominantly of hard standing surface finishes, hence infiltration into underlying aquifers will not be increased;</p> <p>Attenuation tanks will be provided for storage and flow control around the site and two of these are of note as they serve twin purposes. The attenuation tank under the BESS area is sized to accommodate the critical 1 in 100 year storm event for general storm requirements, the 1 in 10 year, 24 hour event in case of a battery fire and sized for storing contaminated firewater in the case of a fire inside the DC or EC.</p> <p>In the event that the abstraction is to be temporarily, increased in volume, this would be carried out in discussion with the EPA, such that risk to the surface water sources is minimised. It is noted that the current upstream abstraction licence is only less than 1% of the 95%ile low flow in the upstream River Boyne; and</p> <p>The existing firewater retention risk assessment will be revised and updated as appropriate for the Proposed Development. Firewater retention is provided for in the design of the Proposed Development, as detailed in the Engineering Report. The sizing of the attenuation tank under the BESS area includes storage of contaminated firewater in the case of a fire inside the data centre or energy centre. The firewater retention storage volume for the chemical storage area will, in line with EPA guidance, be 110% of the capacity of the largest tank or 25% of the total volume.</p> <p><u>Emergency Remediation</u></p> <p>In the event of an operational fire incident, the Proposed Development has considerable onsite storage capacity for water to deal with such an emergency event.</p> <p>As mentioned above, the foul sewer will be installed under the Data Centre and Energy Centre to collect potentially contaminated fire water runoff in the event of a fire. It is proposed to pump this water to the attenuation tank/contaminated water tank under the BESS which automatically shuts off the outfall during such an event to capture the contaminated water so that it may be pumped out and removed off site in tankers. The tank is fitted with a pH-controlled actuator on the outfall and in the event of detection of contaminated water from a fire, will close the tank turning it into a fire water runoff storage tank such that the water can be pumped out at a later stage and disposed of off-site.</p> <p>Another location on the site that could have potentially contaminated fire water runoff in the event of a fire is the BESS itself. This location is external and will be provided with a sealed concrete pavement with an upstand to ensure that no contaminated runoff could to discharge to, and potentially contaminate, surface water and/or groundwater.</p> <p>The above system has been designed in accordance with the requirements of the <i>EPA Guidance on Retention Requirements for Firewater Run-off (2019)</i>. This is also detailed in <i>Chapter 2 Description of the Proposed Development</i> and which is applicable to the operational phase of the development.</p> <p>The proposed mitigation measures outlined above for the Construction and Operational phases would also be implemented during any future decommissioning of the site, where required.</p> <p><u>Habitat Degradation – Groundwater</u></p> <p>In addition to the relevant mitigation measures outlined above in Section 8.9 for the operation phase, attenuation has been proposed to help protect groundwater during the operational phase of the Proposed Development. As discussed above in detail in Section 8.8.2 it is proposed to install an attenuation/soakaway close to the location where the drainage leaves the site and enters the River Boyne. The soakaway will be sized to accommodate a 100year rainfall event including 20% climate change factor of safety. This water will be discharged to groundwater by infiltration. The soakaway will aim to reduce the water that discharges to the River Boyne.</p> <p><u>Habitat Degradation – Air Quality</u></p> <p>The Proposed Development includes nine gas engines. Engine operation load will be minimised through the implementation of energy conservation design measures and renewable energy sources. This site will be governed by an IE Licence from the EPA and all emissions to atmosphere will be controlled under this.</p> <p>CORE will adopt a number of technologies to both limit energy consumption and maximise sustainable energy generation. The proposal includes:</p> <p>Significant Photovoltaic (PV) arrays on the DC roof and southern façade, EC roof and on grade at capped Stockpile no. 3 and the Landfill;</p> <p>Building design with a high thermal performance of envelope;</p> <p>Passive water cooling will be utilised for the DC from the existing freshwater infrastructure at the PPL site to limit cooling load, contributing to a reduction in energy demand for cooling the DC;</p> <p>Monitoring of energy consumption of each fuel type will be implemented.</p> <p>The Proposed Development site will be governed by an IE Licence from the EPA and all emissions to atmosphere will be controlled under this.</p> <p>For further information on energy technologies proposed for the CORE, refer to Chapter 12 Climate of this EIAR and the Engineering report (document</p> |                  |

| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Residual Effects |
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|                      | <p>number BEC231-ATK-XXX-XXXX-XX-RP-CE-300001) submitted with this planning application. Refer to Chapter 1 Introduction of this EIAR regarding the EPA licensing requirements for the site.</p> <p><u>Monitoring Requirements</u></p> <p>The site's IE Licence will specify emission limit values for each gas engine which will need to be complied with and annual emissions monitoring requirements to confirm compliance.</p> <p><u>Habitat Degradation – Non-Native Invasive Plant Species</u></p> <p>Once the Proposed Development is in operation, and in the absence of any required management during the Construction Phase, which might extend into the Operational Phase depending on the method of eradication used, PPL or its appointed specialist contractor as necessary will implement a maintenance and management regime subject to their current management procedures for trackway maintenance, where any introduction of non-native invasive plant species are managed, across their assets or the ongoing control and management of invasive species at their facility. It will be a condition of operating on this site that adequate and robust measures are employed to ensure that should any non-native invasive plant species be inadvertently introduced to the site, rapid and effective measures will be undertaken to remove it. This requirement will form part of broader trackway maintenance obligations that include proactive management across all assets regarding invasive species.</p> <p><b>Mammals</b></p> <p><u>Indirect Disturbance of Flight Patterns Due to Operational Lighting</u></p> <p>The lighting design has identified sensitive areas for bats (Figure 8.9). In addition to the design elements outlined in section 8.8.2, the following shall be required in areas of light installation.</p> <p>Accessories such as baffles, hoods or louvres shall be used to further reduce light spill in these identified sensitive areas and direct it only where needed</p> <p>No further mitigation is required.</p> <p><b>Badger</b></p> <p>The Operational phase of the Proposed Development poses no likely threat to the badger population. However, as mammal proof fencing is to be installed for the construction phase, a post construction survey will be required by a suitably qualified ecologist prior to fence removal to ensure no harm to local badger population at operational phase. To ensure no disturbance effect from lighting at Operational Phase, Light spill from any newly installed lighting is to be kept off of area of scrub to the north where badger evidence was recorded.</p> <p><b>Otter</b></p> <p><u>Habitat Degradation – Surface Water Quality</u></p> <p>For mitigation to avoid the effects of habitat degradation as a result of impacts on surface water quality on otter, refer to Section 8.9.1.</p> <p><b>Marine Mammals</b></p> <p><u>Habitat Degradation – Surface Water Quality</u></p> <p>For mitigation to avoid the effects of habitat degradation as a result of impacts on surface water quality on otter, refer to Section 8.9.1.</p> <p><b>Other Mammal Species</b></p> <p>The Operational Phase of the Proposed Development is not predicted to result in any significant effects to populations of other terrestrial protected small mammal species in the vicinity of the Proposed Development. Therefore, no additional mitigation is proposed.</p> <p><b>Breeding Birds</b></p> <p>As there is no risk of a significant negative effect from Operational Impacts of the Proposed Development on breeding birds, including Breeding QI Annex I kingfisher, mitigation measures intended to avoid or reduce any harmful effects of their populations are not required.</p> <p><b>Wintering Birds</b></p> <p>As there is no risk of a significant negative effect from operational impacts of the Proposed Development on wintering SCI and non-SCI bird species, mitigation measures intended to avoid or reduce any harmful effects of their populations are not required.</p> <p><b>Reptiles</b></p> <p>The Operational Phase of the Proposed Development is not predicted to result in any significant effects to reptiles in the vicinity of the Proposed Development. Therefore, no mitigation is proposed.</p> |                  |

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| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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|                      | <p><b>Amphibians</b><br/><u>Habitat Degradation – Surface Water Quality</u><br/>For mitigation to avoid the effects of habitat degradation as a result of impacts on surface water quality, refer to Section 8.9.1.</p> <p><b>Fish</b><br/><u>Habitat Degradation – Surface Water Quality</u><br/>For mitigation to avoid the effects of habitat degradation as a result of impacts on surface water quality, refer to Section 8.9.1.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       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| Noise and Vibration  | <p><b><u>Construction Phase (including Demolition)</u></b><br/>The construction phase of the development will have the potential to cause an increase in noise levels and vibration in the immediate vicinity of the development site. However, as part of the construction contract and Construction Environmental Management Plan (CEMP), the development contractor will be obliged to reduce as far as possible the potential noise and vibration effects of the construction activity. The main mitigation measures to be taken are as follows:</p> <p>Control of Working Hours. Construction noise will occur for a period of ca. 38 months. Normal construction working hours will be Monday to Saturday 07:00 to 19:00. There will be no works on Sundays or public holidays;</p> <p>Construction works on Saturdays 13:00-19:00 will be scaled down in comparison to works during the rest of the week, and will not involve any noisy activities, such drilling, breaking, crunching or hammering, for example;</p> <p>Demolition activities will be limited to Monday to Saturday 07:00 to 19:00;</p> <p>All construction equipment will be correctly operated and maintained to ensure optimal performance and minimise out of balance effects that may result in ground-borne vibration or excessive noise. Noisy equipment will be located as far as practicable from noise sensitive receptors;</p> <p>Machinery and equipment shall be appropriately maintained and operated in accordance with the manufacturer's recommendations and switched off when not in use with preferable selection of plant with lower inherent potential for generation of noise and/or vibration;</p> <p>All construction equipment used will be required to comply with the relevant regulations on plant and equipment noise, namely the European communities (Noise Emission by Equipment of Use Outdoors) Regulations, 2001 (SI No. 632 of 2001) &amp; Amendment Regulations, 2006 (SI No. 241 of 2006);</p> <p>Minimisation of impulsive noise sources and activities, including demolition works, reduction of material drop heights, minimising hammering activities, restricting rock breaking activities during morning-time hours together with regular checks during impulsive noise generating activities at the nearest noise sensitive locations such as the national schools and the nearest residential properties;</p> <p>Erection of a 2.4m high hoarding around the construction area to provide screening between the works and offsite receptors;</p> <p>Noise and vibration monitors will be installed for the duration of the demolition and construction works. The locations of these monitors will be agreed with Louth County Council in advance of the works, but will include at a minimum monitors at the western boundary of the PPL site, adjacent to NSL1 (the permitted LRD to the west of the PPL site);</p> <p>Keeping all site access roads even so as to mitigate the potential for vibration from HGV movements;</p> <p>Establishing channels of communication between the Principal Contractor / Developer, Louth County Council, and neighbours (such as nearby residents and commercial properties); and</p> <p>All relevant stakeholder will be made aware of the proposed dates and times of any explosive demolition works well in advance of such works occurring.</p> <p><b><u>Operational Phase</u></b><br/>An Industrial Emissions licence will be required to allow PPL carry out the Proposed Development activities. The Site will then be governed by the conditions set out in this licence which will include noise emission limits and noise monitoring requirements.</p> <p>The following mitigation measures will be implemented:</p> <p>Design, procurement and installation of new equipment to relevant industry standards (IS, EN etc.);</p> <p>Specification of maximum noise limit criteria for new equipment in procurement contracts to ensure that the sound pressure levels predicted by this assessment will be met at NLSs, including the absence of tonal/impulsive components in external equipment;</p> <p>Inspection and maintenance of equipment as part of preventive maintenance programme to ensure continued normal operation and minimise any noise issues occurring;</p> <p>The condensers to be located on the roof of the DC building will be capable of operating at a lower rating during night-time hours, thereby reducing their sound power levels during this time;</p> | <p><b><u>Construction Phase (including Demolition)</u></b><br/>With the mitigation measures outlined in Section 9.7.1 in place, the effects of the construction phase of the Proposed Development on the noise environment are likely to be short-term, negative and slight (in accordance with the EPA (2022) Impact Assessment Criteria set out in Table 1.5 of this EIAR).</p> <p>As demonstrated in Section 9.5.1, there are no vibration effects associated with the construction phase of the development.</p> <p><b><u>Operational Phase</u></b><br/>With the mitigation measures outlined in Section 9.7.2 in place, the effects of the operational phase of the Proposed Development on the noise environment are likely to be long-term, negative and imperceptible (in accordance with the EPA (2022) Impact Assessment Criteria set out in Table 1.5 of this EIAR). The site will comply with the requirements of its Industrial Emissions Licence.</p> <p>As demonstrated in Section 9.5.3, there are no vibration effects associated with the operational phase of the development.</p> |



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| Environmental Factor          | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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|                               | <p>Restricting any specific noisy activities which could impact on ambient noise levels (e.g. heavy goods deliveries, heavy maintenance) to daytime hours only (07:00-19:00);</p> <p>Testing and maintenance of the alternative cooling systems will be restricted to day time hours only. No testing or maintenance will be carried out during evening time (19:00-23:00) or night-time (23:00-07:00) hours;</p> <p>As shown in the landscape plans accompanying this planning application, a berm with planting is proposed along the western boundary of the PPL site adjacent to the permitted LRD. This will provide a level of screening / noise attenuation, not taken into account in the potential effects section of this assessment in Section 9.5; and</p> <p>Periodic noise monitoring will be carried out during the operational phase in accordance with the Site's Industrial Emissions Licence.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Water &amp; Wastewater</b> | <p><b>Construction Works (including Demolition)</b></p> <p>Mitigation measures to prevent adverse effects on hydrological features during construction phase include:</p> <p>Prior to commencing decommissioning and demolition works the existing site drainage network, including sumps and interceptors, shall be cleaned and inspected. Where necessary additional temporary drainage shall be installed to capture and control the run-off arising from the demolition works (road washing, dust control run-off, pipe-line cleaning etc.) in order to prevent contamination or deleterious materials entering water courses or the adjacent SAC/SPA;</p> <p>Drain points shall be identified prior to commencing demolition works and shall be managed as the works proceed to prevent flooding. Upon completion these are to be capped as required. Where it is expected that significant debris could enter the drains, they will be protected with filter material which will be replaced regularly;</p> <p>During crushing activities water and dust controls will be in place;</p> <p>There will be no crushing of any demolition material at the wharf to prevent suspended sediment from going to the Boyne Estuary;</p> <p>Excavated material will be stored away from drains within the site and silt control measures put in place. Excavated material, where not being reused on site, will be removed off site as soon as possible in accordance with the requirements of waste legislation. The main contractor will be responsible for the management of excavated material and the safe disposal of this material to a suitably licenced waste disposal facility.</p> <p>During earthworks, appropriate risk management measures will be implemented (e.g. stockpiling good practice including basal protection, bunding, cover systems, management of leachate water, capping layers);</p> <p>Direct discharge of sediment laden or contaminated water to adjacent surface water bodies will be forbidden;</p> <p>Before commencement of construction and demolition works, localised temporary enabling works will be carried out at the existing stormwater pipeline, prior to the discharge point, to facilitate the installation of a temporary stormwater treatment system, as follows:</p> <ul style="list-style-type: none"> <li>- A Siltbuster treatment system or similar will be installed followed by a petrol interceptor, and the installation of a flap valve on the final manhole, prior to discharge to the River Boyne.</li> <li>- This temporary system will be in place for the full duration of the demolition and construction works, until the proposed drainage system has been installed and fully commissioned.</li> <li>- This will ensure that stormwater discharge from the site during the demolition and construction works will be treated prior to discharge to the River Boyne.</li> <li>- The temporary water treatment system will be subject to temporary works design by the Contractor, including all required system maintenance.</li> <li>- The temporary water treatment system will be subject to a daily visual inspection by the Contractor, to ensure optimum system performance.</li> </ul> <p>Fuel for plant will be stored in double bunded tanks, their location will take into account features such as drainage systems. This will ensure, in the event of catastrophic failure, released liquids will be contained locally. Spill kits will be maintained near to fuel storage and refuelling areas;</p> <p>Chemicals will be stored in ventilated bunded areas. This will ensure, in the event of catastrophic failure, released liquids will be contained locally. Spill kits will be maintained near the storage area;</p> <p>Raw or uncured waste concrete will be collected and disposed of in an appropriate manner, and will not be discharged to any storm water sewer, drainage ditches or watercourses. Any concrete delivery trucks coming to the site to deliver concrete will required to wash out their trucks at their own company depots;</p> <p>Vehicle washdown will take place in designated areas and water will be recovered and tankered off-site weekly for final disposal/treatment by a licensed waste contractor; and</p> <p>All conditions relating to water and wastewater contained within the site's existing IE Licence (Reg. No. P0376-02) will be adhered to during the construction phase.</p> | <p><b>Construction Works (including Demolition)</b></p> <p>Potential effects on relevant hydrological features during construction phase are assessed and described in accordance with NRA Guidance (2008) and EPA Guidance (2022) in Section 10.5.1.</p> <p>No significant adverse residual effects on relevant hydrological features are predicted. As such, there will be no significant effects on the WFD status of relevant water bodies as a result of the construction of the Proposed Development.</p> <p><b>Operational Phase</b></p> <p>Potential effects on relevant hydrological features during operational phase are assessed and described in accordance with NRA Guidance (2008) and EPA Guidance (2022) in Section 10.5.2.</p> <p>No significant adverse residual effects on relevant hydrological features are predicted. As such, there will be no significant effects on the WFD status of relevant water bodies as a result of the Proposed Development.</p> |

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| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Residual Effects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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|                      | <p><b><u>Operational Phase</u></b></p> <p>Mitigation measures to prevent adverse effects on hydrological features during operational phase include:</p> <p>As detailed in the Civil Engineering Planning Report included in this planning application, firewater run-off retention capacity, which automatically shuts off the tank outfall during a fire event, will be installed as part of the redevelopment works preventing loss of potentially contaminated firewater run-off to surface water in the event of a fire;</p> <p>All hazardous storage areas will be, as a minimum, bunded, either locally or remotely, to a volume not less than the greater of 110% of the capacity of the largest tank or drum within the bunded area; or 25% of the total volume of substance that could be stored within the bunded area;</p> <p>As required by the site IE Licence, an Environmental Management System (EMS), incorporating a set of measures / practices to minimise environmental impact, will be implemented at the Proposed Development and will include site maintenance which will involve integrity testing of drainage systems and secondary containment bunds as well as spill response management procedures;</p> <p>All conditions and emission limit values (ELVs) relating to water and wastewater contained within the site's IE Licence will be adhered to during the operational phase; and</p> <p>In addition to the mitigation measures proposed, design of the Proposed Development incorporates SuDS measures and attenuation structures with flow controls in the proposed storm water management system. This will control the quantity of runoff to support the management of flood risk.</p> <p><b><u>Monitoring</u></b></p> <p><b><u>Construction Works (including Demolition)</u></b></p> <p>Site discharges at IE Licenced emission point SW1 will be subject to an ongoing sampling and monitoring regime in compliance with the site's IE Licence with monitoring samples collected on site at the weir outfall prior to discharge.</p> <p><b><u>Operational Phase</u></b></p> <p>Following redevelopment of the site, site discharges at IE Licenced emission point SW1 will be subject to an ongoing sampling and monitoring regime in compliance with the site's IE Licence.</p>                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Air Quality          | <p><b><u>Construction Phase (including Demolition)</u></b></p> <p>Standard good practice construction measures, such as water spray, atomisers etc. will be implemented to minimise the generation of dust. It will be a requirement to ensure sufficient dust control measures are in place during this phase;</p> <p>Works will only be carried out subject to an agreed and approved method statement;</p> <p>Water Cannons and dust buster units will be used during demolition activities;</p> <p>All structures will undergo internal wash down prior to demolition;</p> <p>All construction vehicles will be driven on existing site roads and areas of hard standing and consequently will not transport mud or earth during movement;</p> <p>Internal site roads will be kept damp during dry periods;</p> <p>Concrete crushing facilities will be setup at locations away from sensitive areas and strictly controlled with dampening down;</p> <p>Wheel washing facilities will be in place for vehicles leaving site;</p> <p>External roads next to the site exits will be kept clean using road washer vehicles;</p> <p>All demolition and most of the construction work will be carried out within the confines of the existing production site;</p> <p>Vehicles using site roads will have their speed restricted, and this speed restriction will be enforced rigidly;</p> <p>Loose materials that are transported on or off site will be properly contained;</p> <p>Potentially dusty material being removed from the site will be transported in covered trucks, where the likelihood of emitting dust is high, and during dry weather conditions, the area of removal will be sprayed with a mobile tanker on a regular basis to control dust emissions;</p> <p>The Construction Management Team (CMT) will carry out regular inspections of all trucks and will be required to record any incidents or situations where adequate cleanliness is not achieved. The registration numbers of all trucks will be maintained by the contractor and this will ensure traceability;</p> <p>If cement is stored in a silo on site, a filter will be fitted to the silo; alternatively, ready-mix concrete will be supplied for just-in-time delivery;</p> <p>Good housekeeping and site management will be observed including the proper storage of spoil / loose materials on site;</p> <p>During dry periods, use of dust-dampening techniques (water dampening of dust on roads, use of low speed limits onsite, use of covers on dusty materials during transport and storage);</p> | <p><b><u>Construction Phase (including Demolition)</u></b></p> <p>With the mitigation measures outlined in Section 11.7 in place, the residual effects of the construction and demolition phase of the Proposed Development on air quality are likely to be short-term, neutral and not significant in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance.</p> <p><b><u>Operational Phase</u></b></p> <p>No significant effects were predicted for the operational phase of the Proposed Development. Based on predicted results and the conservative nature of the assessment, residual effects on air quality are likely to be long-term, neutral and imperceptible in accordance with the impact assessment criteria provided in Section 3.7.3 of the EPA (2022) Guidance.</p> |

| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Residual Effects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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|                      | <p>Generation of silty water run-off (and dust) from the stockpiles will be prevented through the use of covers and silt fences;</p> <p>Exhaust emissions from construction plant and equipment operating within the site, including trucks, excavators, diesel generators and compressors, will be controlled by the contractor by ensuring that the equipment is well maintained and is operated in accordance with normal good practice.;</p> <p>All vehicles and combustion equipment will undergo appropriate inspection and maintenance to ensure proper functioning;</p> <p>Sweeping of hard road surfaces;</p> <p>Provision of a water bowser on site, regular spraying of haul roads;</p> <p>Public roads in the vicinity will be inspected and kept clean;</p> <p>Material stockpiling will be provided with adequate protection from the wind;</p> <p>Road maintenance agreement will be detailed between operator and the Local Roads Authority to clarify responsibility for the upkeep and repair of access roads during the construction phase;</p> <p>Existing boundary screening planting will be retained until the newly planted hedgerow are established reducing of dust emanating Proposed Development.</p> <p>The following specific mitigation measures will be implemented for the demolition of the existing conveyor structure associated with the existing quay facility (wharf) that is directly adjacent to the River Boyne (and also the River Boyne &amp; Blackwater SAC):</p> <p>the conveyor belt will undergo a wash down prior to demolition, water Cannons and dust buster units will be used through demolition of the conveyor belt, covers and silt fences will be used to capture potential sedimentation from run-off water generated during wash-down/demolition of the conveyor belt, and temporary dust screening will be in place during demolition of the conveyor structure.</p> <p><b><u>Operational Phase</u></b></p> <p>Significant Photovoltaic (PV) arrays on the DC roof and southern façade, EC roof and on grade at capped Stockpile no. 3 and the Landfill;</p> <p>Building design with a high thermal performance of envelope;</p> <p>Passive water cooling will be utilised for the DC from the existing freshwater infrastructure at the PPL site to limit cooling load;</p> <p>Monitoring of energy consumption of each fuel type will implemented.</p> <p><b><u>Monitoring Requirements</u></b></p> <p><b><u>Construction Phase</u></b></p> <p>Dust monitoring units will be required to be in place at various locations on the site boundary perimeter during the construction phase.</p> <p>Regular inspections and audits of the construction activities will be carried out by the CMT to ensure that all mitigation measures outlined in this EIAR and CEMP have been implemented in full.</p> <p><b><u>Monitoring Requirements</u></b></p> <p>Appropriate emission limits and monitoring requirements will be set within the licensing regime for the site and these will be complied with in full.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Climate              | <p><b><u>Construction Phase</u></b></p> <p><b><u>Embodied Carbon Mitigation Measures</u></b></p> <p>The Proposed Development has focused on retention of existing buildings and infrastructure on site where possible including the Workshop Building, 3 no. silos, Partial Crane Shed, seawater tanks and existing pump houses. This has resulted in saving of carbon emissions which would have been generated from complete demolition of the existing site and construction of new buildings/infrastructure. This will result in significant carbon savings which are not quantified within this Chapter.</p> <p>A number of carbon reduction strategies have been incorporated into the design of the Proposed Development as detailed in Section 12.4.1 of this EIAR, and reiterated below :</p> <p>Concrete Specification: The Business as Usual (BAU) carbon model assumes a Portland cement concrete mix (CEM I) with no cement replacement content – in line with market average mixes in Ireland. The Proposed Development will specify a concrete mixture with 10% Cement replacement for foundations and beams (CEMII/A-V) and 60% Cement replacement for structural elements (CEMIII/A), equivalent to a saving of 23 kgCO<sub>2e</sub> per m<sup>3</sup> of concrete for foundations and beams, and 137 kgCO<sub>2e</sub> per m<sup>3</sup> for concrete slabs and frame elements.</p> <p>Steel Rebar Specification: Currently, the BAU carbon model assumes steel rebar that has not been recycled. The Proposed Development will specify the use of rebar which is made of 95% recycled steel, or equivalent.</p> <p>Design Efficiency: As part of the effort to reduce carbon emissions by minimising materials usage, one enhancement proposal included in the Proposed Development involves improving design efficiency to decrease steel tonnage by 10%. This initiative is expected to yield significant carbon reduction,</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p><b><u>Construction Phase</u></b></p> <p>The mitigation measures outlined in Section 12.11.1 ensure the development contributes positively to the achievement of the key targets for the Industrial Sector from CAP24 to decrease embodied carbon for materials produced and used in Ireland as it will create a demand for lower carbon materials thereby encouraging producers to work towards the supply of such materials.</p> <p>As the design of the Proposed Development progresses, the Design Team will explore alternative options aimed at enhancing efficiency, such as minimising the use of materials in the building. This approach will render the building more environmentally friendly and further mitigate the carbon emissions associated with its development.</p> <p>However, given the current estimated embodied carbon associated with the Proposed Development, the residual effect on climate change from the Proposed Development is deemed to be '<i>minor adverse</i>' and therefore '<i>not significant</i>' in accordance with the criteria outlined in Section 12.4.1 '<i>GHG Significance Criteria</i>' of this</p> |

| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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|                      | <p>considering that each tonne of steel typically accounts for 2.5 tCO<sub>2</sub></p> <p>PV Panels Specification: Currently, the BAU carbon model assumes PV panels which are procured from China with 77% recycled content. The Proposed Development will specify the use of PV panels with 89% recycled content (assumed to be procured from Europe).</p> <p>The energy consumption associated with the construction phase of the Proposed Development will be minimised through the implementation of energy conservation measures where possible.</p> <p>Contractors will be required to complete; pre-construction checks on vehicles; pre-start checklists for daily checks; and service of plant and machinery to ensure there is no excessive pollution from plant and machinery.</p> <p>The construction project contractor will operate a continuous incentive scheme to encourage car-pooling and lift sharing by all construction staff, with eligibility for the incentive scheme based on a minimum vehicle occupancy rate of two construction staff per vehicle.</p> <p><b><u>Embodied Carbon Monitoring</u></b></p> <p>As the design of the Proposed Development progresses, ongoing monitoring and optimisation of embodied carbon emissions will be implemented to ensure continued alignment with the projects carbon reduction goals and industry standards. The procurement stage has a very big influence on the actual embodied carbon impacts arising from the development, and therefore extra care should will be given to this stage. The procurement stage will focus on implementing the following elements:</p> <p>Responsibly sourced materials with certificates to prove their sustainable supply chain credentials;</p> <p>Materials with higher recycled content;</p> <p>Any re-useable/repurposed materials;</p> <p>Favouring products with Environmental Product Declarations (EPDs) to allow a clear comparison between different products, giving priority to products with a lower embodied carbon impact.</p> <p>Contractors will be required to monitor and report energy usage during construction including fuel, water, and transport emissions for materials and staff commuting to and from the site.</p> <p><b><u>Climate Change Resilience Assessment Mitigation Measures</u></b></p> <p>Climate change resilience impacts during the construction phase are expected to be short-term and negligible if correctly managed by the Construction Management Team with appropriate measures as dictated by weather forecasts during the construction phase. Examples of these measures include:</p> <p>Restricting access to site or working hours due to a severe weather event (storms, flooding, snow, ice);</p> <p>Postponement of planned activities during unsuitable conditions for certain construction activities due to extremes of hot, wet or cold weather.</p> <p>All contractors must have an Environmental Management System (EMS) in place which will consider all measures deemed necessary to manage extreme weather events.</p> <p>All contractors have emergency preparedness and contingency procedures in place for an extreme weather event on the construction site or within the supply chain as appropriate.</p> <p>All construction method statements must consider extreme weather events as appropriate.</p> <p><b><u>Operational Phase</u></b></p> <p><b><u>Operational Carbon Mitigation Measures</u></b></p> <p>Use of dry cooling for most of the year and water-based evaporative cooling only during peak summer temperatures allows for a more efficient cooling system contributing to reduction in freshwater use;</p> <p>Existing freshwater abstraction point from Littlegrange/Mell Quarry will be utilised for Fire Water supply and DC Cooling on site;</p> <p>The proposed Landscape Plan includes planting that does not require irrigation systems post establishment;</p> <p>Low flow and flush fixtures and fittings will be included during detailed design stages for the Proposed Development.</p> <p><b><u>Monitoring</u></b></p> <p><b><u>Operational Carbon Monitoring</u></b></p> <p>As a GHG permit holder, PPL will be required to monitor GHG emissions generated from the operation of the proposed gas engines at the site and report this on an annual basis to the EPA;</p> <p>&gt; 90% of regulated energy use will be targeted to be metered. The remaining quantity of energy consumed will be monitored;</p> | <p>Chapter.</p> <p><b><u>Operational Phase</u></b></p> <p>The mitigation measures implemented to ensure minimal generation of GHGs from the operation of the Proposed Development are included as part of the design of the proposed energy infrastructure at the site and are described in detail under Section 12.2.2 and 12.9.1 of this Chapter.</p> <p>With the implementation of the mitigation/offsetting of carbon emissions as set out in Section 12.9.1 of this Chapter, the residual effect of the operational phase of the Proposed Development would be '<i>negligible</i>' and therefore '<i>not significant</i>' in accordance with the criteria outlined in Section 12.4.1 '<i>GHG Significance Criteria</i>' of this Chapter. A project with 'negligible' effects has: GHG impacts which are mitigated beyond design standards, gone well beyond existing and emerging policy requirements; and is well '<i>ahead of the curve</i>' for Ireland's trajectory towards net zero.</p> |



| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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|                      | <p>Estimated energy consumption of each fuel will be identified, with 100% of all fuel types being continually monitored in real time;</p> <p>Unregulated energy such as this will form part of the overall energy campus efficiency.</p> <p>Water usage during the operation of the Proposed Development will be monitored through water metering.</p> <p><b><u>Climate Change Resilience Assessment Monitoring</u></b></p> <p>No specific monitoring is proposed at this time as mitigation measures for climate hazards will only be implemented in a severe weather event.</p> <p><b><u>Climate Change Resilience Assessment Mitigation Measures</u></b></p> <p>The Climate Change Resilience Risk Assessment will be reviewed and updated as necessary to include any additional design-related adaptation measures that have been implemented.</p>                                                                                                                                                        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| Waste Management     | <p><b><u>Construction Phase (including Demolition)</u></b></p> <p>Compliance with the CEMP and RWMP will ensure the mitigation of negative effects arising from wastes generated on site, outline versions of each accompany this planning application. Both documents will be updated prior to commencement of works by the contractor to include any mitigation included in the planning permission.</p> <p>In addition, the following mitigation measures will be adopted:</p> <p>Building materials will be chosen to ‘design out waste’ as stated in the AtkinsRéalis Design Statement which accompanies this planning application;</p> <p>On-site segregation of waste materials will be carried out, to increase opportunities for off-site reuse, recycling and recovery. All waste types will be segregated;</p> <p>Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials shall be re-used on-site, where possible; (alternatively, the waste will be sorted for recycling, recovery or disposal);</p> <p>All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;</p> <p>Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);</p> <p>A Resource Manager will be appointed by the main Contractor(s) prior to commencement of works to ensure effective management of waste during the excavation and construction works;</p> <p>All waste leaving the site will be transported by suitably licenced contractors and taken to suitably registered, permitted or licenced facilities;</p> <p>All waste leaving the site will be recorded and copies of relevant documentation maintained.</p> <p>The following mitigation measures are also proposed to reduce the risk to human health from the presence of asbestos at the site:</p> <p>A detailed asbestos survey of all underground services within areas proposed for excavation during the construction phase, shall be undertaken prior to commencement of works to determine the extent of asbestos pipework and other features buried underground when the services have been exposed.;</p> <p>A detailed Asbestos Management Plan (AMP) for any excavation works on the site shall be developed by an asbestos consultant prior to commencement of any demolition works with all mitigation measures, including site operative training and procedures, roles and responsibilities of individuals and monitoring measures detailed within the document.</p> <p>All excavation operations shall be undertaken on the assumption that asbestos containing materials (ACMs) or asbestos pipework could be encountered and appropriate health and safety including appropriate Personal Protection Equipment (PPE) provided to relevant site operatives working in these areas.</p> <p>The asbestos consultant shall advise if HSA notification is required prior to the commencement of any site excavation operations in accordance with <i>The Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations, 2006 &amp; 2010</i>.</p> <p>All asbestos material identified shall be carefully removed and appropriately double-bagged and safely stored on-site for off-site disposal by a suitable licenced waste haulage company to an asbestos licenced waste disposal facility.</p> <p>All excavation operations in areas suspected to contain ACMs shall be supervised by an asbestos consultant.</p> <p>Should additional unknown asbestos material be uncovered during the demolition of the site, all related works and works adjacent to the asbestos (the extent of which is to be determined in accordance with a risk assessment) will be suspended until the asbestos material is removed by a specialist contractor.</p> <p>All PPE shall be treated as a hazardous waste. Disposal of this waste should follow the process outlined above for removal of asbestos material identified at the site.</p> <p><b><u>Operational Phase</u></b></p> | <p><b><u>Construction Phase (including Demolition)</u></b></p> <p>The mitigation measures detailed in Section 13.7.1 of will ensure that all waste arising from the construction phase will be handled to comply with the provisions of the Waste Management Act 1996 (as amended), and associated regulations. Reuse and Recycling of waste produced during the construction phase will be maximised, in particular with respect of cut and fill material and the crushing of concrete for use as aggregate. Waste that cannot be used in the development will be recycled with the exception of hazardous waste such as asbestos which will be deposited in accordance with best practice.</p> <p>The measures proposed will optimise the levels of waste reduction, re-use and recycling during the construction phase. The residual impact is predicted to be negative, slight and short-term.</p> <p><b><u>Operational Phase</u></b></p> <p>The fulfilment of this Proposed Development will see a marked reduction in volume and the total removal of hazardous substances that are a necessary feature of the current enterprise. All future waste produced will be managed in accordance with regulatory requirements including compliance with the provisions of the Waste Management Act 1996 (as amended), and associated regulations, the Litter Pollution Acts of 1997 to 2009, The Circular Economy and Miscellaneous Provisions Act 2022 and the <i>National Waste Management Plan for a Circular Economy 2024-2030</i>.</p> <p>The PPL management team will bring their extensive knowledge and experience to bear to ensure waste reduction, reuse and recycling in congruence with the principles of the “Circular Economy”.</p> <p>The measures proposed will optimise the levels of waste reduction, re-use and recycling during the operational phase. The residual impact is predicted to be neutral, moderate and long-term.</p> |



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| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Residual Effects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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|                      | <p>All operational staff at the site will be required to conform to the site wide EMS.</p> <p>All waste and resource material that cannot be used on site will be sent to licenced recycling and recovery outlets (off-site), thus ensuring the potential long-term impact of waste generation will be minimised.</p> <p>A designated waste management/recycling area will be set up adjacent to the DC Loading dock as shown in the site plans accompanying this planning application. This area is an extensive HGV yard area between the DC and EC which has been designed for HGV/Truck access and turning.</p> <p>All bins and waste receptacles will be sealed and the surrounding area maintained in a clean and tidy manner to promote a clean and tidy work environment.</p> <p>All waste materials will be segregated into appropriate categories and will be temporarily stored in appropriate bins, skips or other suitable receptacles in a designated, easily accessible areas of the site. PPL as the site manager will be responsible for ensuring and allocating personnel and resources, as needed for the production, updating and implementation of an Operational Waste Management Strategy for the site, ensuring a high level of recycling, reuse and recovery at the Site of the Proposed Development.</p> <p>PPL will regularly audit the onsite waste storage facilities and infrastructure, and maintain a full paper trail of waste documentation for all waste movements from the site.</p> <p>PPL will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials. PPL will ensure that all waste collected from the Site of the Proposed Development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available. PPL will ensure that all waste leaving the site will be transported by suitably licenced contractors and taken to suitably registered, permitted or licenced facilities.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Material Assets      | <p><b>Construction Phase (including Demolition Works)</b></p> <p>Normal construction working hours will be Monday to Saturday 07:00 to 19:00. There will be no works on Sundays or public holidays. Construction works on Saturdays 13:00-19:00 will be scaled down in comparison to works during the rest of the week, and will not involve any noisy activities, such drilling, breaking, crunching or hammering, for example. Demolition activities will be limited to Monday to Saturday 07:00 to 19:00;</p> <p>Carry out continuous consultation with the ESB, Gas Networks Ireland and other service providers to time breaks in services to minimise disruption to local residences.</p> <p>Measures to minimise nuisance from the possibility of draw out of site material will include road sweeping, the use of vehicle wheel washes, rumble bar to dislodge clay and muck before exiting the site. Water sprays will be employed to reduce dust in dry weather. All trucks entering and leaving the site will be covered. Road washing will be undertaken as required.</p> <p>The reduction of noise and visual negative impacts, and for the protection of the public, the entire site will be fenced off to a height of 2.4m. Security will be present on the site at all times.</p> <p>A detailed Demolition Management Plan (DMP) has been prepared and a Construction Environmental Management Plan (CEMP). Both plans will be operated concurrently and will be updated as required during the construction and demolition works.</p> <p>A Project Supervisor Construction Stage (PSCS) is to be appointed following contracts award and it should be recognised that the responsibility for the construction works shall lie with them. The works will be carried out in line with the PSCS's own Method Statement together with their policies and procedures, including all relevant Task-Specific Safe Working Procedures. The PSCS will adhere to the main minimum environmental mitigation requirements as stated within this document, but under their own developed systems. During all works, the PSCS will be instructed to control all nuisance throughout the construction period. A monitoring programme will follow current licence requirements and continue to observe the set limits through the said monitoring programme.</p> <p>The PSCS shall execute the works sympathetically to the surrounding environment, and will ensure the mitigation measures are suitable and effective.</p> <p>The Proposed Development will specify the use of rebar which is made of 95% recycled steel, or equivalent. Additionally, the efficient design by the design team has also resulted in a 10% reduction in structural steel from the BAU (Business as Usual) scenario.</p> <p>Recycled Class 6 aggregate will not be incorporated in any structural elements, but will used to fill voids and landscaping purposes.</p> <p>On-site segregation of all waste materials will take place (see <i>Chapter 13 Waste Management</i>). It will be a priority to source materials from locations close to the site, where possible, in order to reduce transport distances.</p> <p>A DMP and Outline CEMP have been developed and detail the environmental controls to minimise demolition and construction effects. The appointed contractor will develop this further prior to demolition and construction. A traffic management plan will be put in place to mitigate the impacts of traffic movement of the R167 Strand Road, full details can found in <i>Chapter 6 Traffic and Transportation</i>. Construction traffic movements will be limited to outside normal rush hours. Dust from traffic movements will be managed by the use of water sprays and wheel washes at the site exits. However the movement of heavy goods vehicles is expected to be less than experienced during full production at PPL.</p> | <p><b>Construction Phase (including Demolition)</b></p> <p>With the mitigation measures outlined in Section 14.7.1 implemented, the residual effects of the Proposed Development on the material assets are likely to be short-term, neutral and imperceptible (in accordance with the EPA (2022) Impact Assessment Criteria set out in Table 1.5 of this EIAR).</p> <p><b>Operational Phase</b></p> <p>With the mitigation measures outlined in Section 14.7.2 in place, the effects of the operational phase of the Proposed Development on the material assets are likely to be long-term, positive and significant (in accordance with the EPA (2022) Impact Assessment Criteria set out in Table 1.5 of this EIAR). The site will comply with the requirements of its Industrial Emissions Licence.</p> |

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| Environmental Factor                           | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Residual Effects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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|                                                | <p><b><u>Operational Phase</u></b></p> <p>The European Energy Performance of Buildings Directive (EPBD) requires all new buildings to be nearly Zero Energy Buildings (nZEB) by 31st December 2020. An Energy Use Intensity (EUI) reduction, in comparison to Part L requirements is being targeted for the Data Centre.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Archaeology, Architectural & Cultural Heritage | <p><b><u>Demolition Phase</u></b></p> <p>The workshop (CH1), three silos (CH2) and three bays of a large steel-framed crane store shed (CH3), substantial structures within the site, will be retained and incorporated into the development to reflect the use of the site in the past. A comprehensive photographic and written record of all the structures across the site will be carried out to record the site's industrial origins prior to their demolition to form a record of the past.</p> <p>An interpretation area that includes signs and digital media linkages, such as QR codes, will provide a comprehensive history and backdrop of the site's industrial heritage development. This will enable visitors to understand and appreciate the cultural significance of the site and the value of the retained structures. The panels will include illustrations and text designed to be informative and readily accessible to the general public, fostering an interest and pride in the heritage of the area.</p> <p>In order to commemorate the railway that once ran through the site, a viewing platform shall be constructed in the southwestern most part of the site. This platform will not only offer a vantage point overlooking the historic Millmount and the Viaduct within the town. It will also preserve and display any fragmentary remains associated with the railway line that is recovered within the site (see <i>Chapter 5 Landscape and Visual</i>). Information panels in this location will detail the railway's significance, characteristics and role in the early operation of the cement factory, early photographs and maps of the railway will support this interpretation.</p> <p>Prior to demolition, a robust cordon will be placed inside the northern and eastern boundary of the site. This will safeguard the access path outside the boundary that leads to the church and graveyard site (RMP No.: LH0025-004) and the Newtownstalaban/Beaulieu townland boundary. The site contractors will be made aware of the heritage value of the boundaries.</p> <p><b><u>Construction Phase</u></b></p> <p>Full-time archaeological monitoring of the earthmoving works is not considered necessary at the site. An archaeologist shall be retained as part of the construction team. Their responsibility will be to assist and provide guidance on a strategy to recover any railway or other industrial objects found on the site during site clearance and demolition works in collaboration with the contractor. The archaeologist will assess these items to determine their suitability for exhibition in the viewing platform display area. Additionally, they will assist in the interpretation of the site for the signage panels.</p> <p><b><u>Operational Phase</u></b></p> <p>No mitigation measures are required during the operational phase of the development. All physical archaeological, architectural and cultural heritage issues will be resolved at the pre-construction stage of the development, and therefore, no potential effects, are envisioned at the operation stage of the development.</p> | <p><b><u>Construction Phase</u></b></p> <p>There are no residual effects during the construction phase. Once the mitigation measures are implemented in full, previously unknown subsurface archaeological features that are identified will be resolved and recorded in full.</p> <p><b><u>Operational Phase</u></b></p> <p>Upon the completion of the Proposed Development, there will be no negative residual effects on the archaeological or cultural heritage resource. The current site is a dominant industrial site within the town of Drogheda and on the banks of the river. The proposed landscaping and rehabilitation of the visually dominant mounds of spoil and structures on the site will improve the existing scenario.</p> |
| Major Accidents & Disasters                    | <p>Mitigation measures against the highest risk major accidents are detailed here. Mitigation measures against the remaining major accidents are detailed in the risk assessment in Tables 16.7 and 16.9 of <i>Chapter 16 Major Accidents and Disasters</i></p> <p><b><u>Construction Phase (including Demolition)</u></b></p> <p><b><u>Mitigation against Contamination of Water Bodies (C1)</u></b></p> <p>Set back distances from rivers and stream by at least 7m, protection and maintenance of set back area vegetation and construction of earth bund between the construction site and set back zone.</p> <p>Temporary silt fences/covers between the construction site and any on-site water course for the duration of the construction works.</p> <p>Prior to commencing decommissioning and demolition works the existing site drainage network, including sumps and interceptors, shall be cleaned and inspected. Temporary drainage shall be installed to capture and control the run-off arising from the demolition works (road washing, dust control run-off, pipe-line cleaning etc) in order to prevent contamination or deleterious materials entering water courses or the SAC/SPA.</p> <p>As outlined in CEMP, all paved areas shall be kept clear of earth material and debris. The site shall be maintained to prevent sediment laden run-off from migrating of site and into the storm drainage system.</p> <p>All existing clean soil from excavations, clean crushed concrete, and other stockpiles will be positioned at a suitable distance from water courses and drainage systems.</p> <p>Existing stockpiles present on site will be used as fill material or other uses once the End of Waste certification is received from the EPA.</p> <p>If offsite disposal of concrete wash water is required, the contractor must make provision for removal and disposal of any concrete wash water, by means of transfer off-site by an approved waste contractor.</p> <p>Where required, the pouring of concrete must take place using a geosynthetic material to prevent concrete runoff into the soil/groundwater media.</p> <p>All fuel, chemicals and lubricants will be stored on hard standing in the staging area that will be protected with designated drainage and equipped with a</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <p>No plausible major accidents or disaster were identified, to which the proposed development will be particularly vulnerable during the construction or operation phase. No plausible potential risks were identified which would result in the proposed development causing a major accident or disaster on or outside the site during construction or operation.</p>                                                                                                                                                                                                                                                                                                                                                                        |

| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Residual Effects |
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|                      | <p>class 1 interceptor of suitable size.</p> <p>No bulk chemicals or oil and fuel storage are to be stored in the construction area.</p> <p>All refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in the designated part of the staging area.</p> <p>Spill kits will be made available to all machinery and in designated areas at all times. Spill kits will be kept in all machines on the site and a large spill kit shall be made available in the site stores.</p> <p>Any hazardous waste residuals or potentially contaminated sludge from spill clean-up must be stored within appropriate metal or plastic containers in temporary bunded storage areas in the construction compounds prior to removal by an approved permitted/licensed waste management contractor for off-site treatment/recycling/disposal.</p> <p>IPC Guidance Note on the Storage and Transfer of Materials for Scheduled Activities (EPA 2004) shall be complied with.</p> <p>Divert uncontaminated stormwater away from the work area and into the stormwater system using flow diversion strategies and devices.</p> <p>Protect sand and soil stockpiles and other materials that may erode with waterproof coverings.</p> <p>Ensure waste is contained in covered bins or traps made from geotextile.</p> <p>Ensure building materials are stored away from drainage paths and up-slope of sediment barriers</p> <p>Install interceptors and silt fences to prevent silt from entering stormwater drains or surface water bodies.</p> <p>During demolition existing stormwater drains will be retained, with surface water diverted to stormwater retention basins for settlement and monitoring.</p> <p>In the event that further ground contamination is encountered beneath the site during the enabling, demolition or construction works, excavation / ground works in the area of identified contamination will cease. Advice will be sought from an experienced contaminated land specialist and a phased environmental risk assessment (specifically to assess any associated potential environmental and/ or human health risks) will be undertaken in accordance with relevant EPA guidance 'Guidance On The Management Of Contaminated Land And Groundwater At EPA Licensed Sites' (EPA, 2013) and UK Environment Agency Guidance 'Land contamination risk management (LCRM)' (UK EA, 2023). An updated GQRA will be prepared by an experienced contaminated land specialist based on the findings of the risk assessment.</p> <p>Any chemicals including sealed chemicals previously used on site will be returned to the suppliers if possible, otherwise disposed of as waste.</p> <p>Where possible material remaining onsite such as diesel will be used during the work phase.</p> <p>Clean to Shell will be carried out under a permitting system, which will include SPAs and/or Risk Assessment and Method Statements, to ensure clean out occurs in a controlled manner.</p> <p><b><u>Mitigation against Release of Asbestos to the Environment (C2)</u></b></p> <p>A refurbishment/demolition asbestos survey (RDAS) has been carried out for every structure to be demolished, which clearly identifies structures that contain asbestos materials.</p> <p>All asbestos will be removed by competent contractors prior to demolition. Asbestos-containing products will be removed in accordance with The Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations, 2006 &amp; 2010 and all amendments thereto. Any high-risk asbestos removal will be completed by the competent contractor under their task specific Asbestos Plan of Work.</p> <p>Separate Plan of Works will be produced by the specialist contractors and Asbestos Notification Form submitted to the HSA.</p> <p>All operatives carrying out works will require to be fully specialised Asbestos trained personnel for Licensed work and trained to at least Lower Risk Asbestos Removal Standard. All training must be ARCA (Asbestos Removal Contractors Association) approved.</p> <p>Control access to the building will be in place to essential personnel only.</p> <p>Asbestos to be removed will be identified and then removed as per Plan of Works.</p> <p>Some areas will require full asbestos enclosures built with air and bag locks, and under the correct negative pressure as per regulations. All enclosures will be smoke tested before use.</p> <p>Handheld spray will be used (wetting and surfactant agent) to dampen the area down as asbestos removed.</p> <p>Injection systems may be required on areas of lagging.</p> <p>Asbestos waste will be double bagged or sealed in 1000-gauge sheeting.</p> <p>Strict control of asbestos transit routes will be put in place.</p> <p>Asbestos waste will be placed into secure lockable asbestos skips and located nearby the asbestos removal activity to minimise transit of materials.</p> <p>Disposal of material will be to an approved waste disposal facility transported using ADR regulations (European Communities (Carriage of Dangerous</p> |                  |

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| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Residual Effects |
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|                      | <p>Goods by Road and Use of Transportable Pressure Equipment) Regulations, 2011 (S.I. No. 349 of 2011), as amended</p> <p>Independent Asbestos analysts will certify areas when asbestos removal is finished and provide clearance certifications for reoccupation and use.</p> <p>All asbestos waste removed will be recorded.</p> <p>All remediation works will be supervised by an appropriately qualified Environmental Consultant and excavation works will be carried out carefully to ensure no potential for cross-contamination occur.</p> <p>All excavation works from Stockpiles 1 and 2 will be supervised by an appropriately qualified Environmental Consultant with relevant contaminated land experience to allow visual screening of all material and segregation as required.</p> <p>A sampling programme will be implemented to verify that the excavated material is suitable for placement within the onsite landfill, and that all material deposited at the landfill, from Stockpile 1 and Stockpile 2 and any other onsite mounds, fully meets the relevant landfill licence criteria. The proposed testing suite shall include ACMs.</p> <p>A detailed Asbestos Management Plan (AMP) for any excavation works on the site will be developed by an asbestos consultant and all recommend mitigation measures will be incorporated in the final CEMP.</p> <p>All excavation operations shall be undertaken on the assumption that ACMs or asbestos pipework could be encountered and appropriate health and safety including appropriate Personal Protection Equipment (PPE) provided. All excavation operations in areas suspected to contain ACMs should be supervised by an asbestos consultant.</p> <p><b><u>Mitigation against Fire and Explosion (C4)</u></b></p> <p>During the demolition and construction phase, the quantities of flammable or explosive materials required, which could ignite or spill, will be minimal and will be confined to the construction compound.</p> <p>In any areas with electrical equipment, or hydrocarbons, water will not be used for firefighting. As part of the CEMP the contractor will ensure that all relevant fire safety requirements are in place prior to commencement of works.</p> <p>All fuel, chemicals and lubricants will be stored on hard standing in the staging area that will be protected with designated drainage and equipped with a class 1 interceptor of suitable size.</p> <p>No bulk chemicals or oil to be stored in the construction area, and limited fuel storage are to facilitate refuelling.</p> <p>All refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in the designated part of the staging area.</p> <p>Spill kits will be made available to all machinery and kept in designated areas at all times. Spill kits will be kept in all machines on the site and a large spill kit will be made available in the site stores.</p> <p>Any hazardous waste residuals or potentially contaminated sludge from spill clean-up must be stored within appropriate metal or plastic containers in temporary bunded storage areas in the construction compounds prior to removal by an approved permitted/licensed waste management contractor for off-site treatment/recycling/disposal at a permitted or licenced facility.</p> <p>IPC Guidance Note on the Storage and Transfer of Materials for Scheduled Activities (EPA 2004) shall be complied with.</p> <p>All pipework etc. will be cleaned by licenced contractors.</p> <p>Any hazardous steel structures such as oil or chemical tanks will be cleaned and gas-freed prior to demolition.</p> <p><b><u>Mitigation against Dust Expollosion (C7)</u></b></p> <p>A system will be enabled to ensure clean out occurs in a controlled manner. SPAs (Safe Plans of Action) and/or Risk and Method Statements will accompany permits, to show that every eventuality is considered when assessing an approach to clean-out.</p> <p>ATEX procedures will be in place to ensure suppression of dust and removal of ignition sources while clean-out occurs.</p> <p>Standard good practice construction measures, such as water spray, atomisers etc. will be implemented to minimise the generation of dust.</p> <p>Works will only be carried out subject to an agreed and approved method statement.</p> <p>Water Cannons and dust buster units will be used during demolition activities.</p> <p>All structures will undergo internal wash down prior to demolition.</p> <p>Concrete crushing facilities will be setup at locations away from residential areas and strictly controlled with dampening down;</p> <p>If cement is stored in a silo on site, a filter will be fitted to the silo; alternatively, ready-mix concrete will be supplied for just-in-time delivery</p> |                  |

| Environmental Factor | Mitigation measures and/or monitoring proposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Residual Effects |
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|                      | <p>Good housekeeping and site management will be observed including the proper storage of spoil / loose materials on site.</p> <p><b><u>Operational Phase</u></b></p> <p><b><u>Mitigation against Contamination of Water Bodies (Op1)</u></b></p> <p>No manufacturing facility at proposed plant, therefore there will be no process effluent.</p> <p>All new sewers that will collect foul effluent from the various buildings as part of the Proposed Development will be designed in accordance with the latest Uisce Éireann Code of Practice and Standard Details.</p> <p>All surface water runoff from the site will be collected in the site's storm water system. Abstracted seawater from Baltray Reservoir will be used to reduce the pH of surface water runoff to comply with IEL limits, as required. This licensing arrangement with EPA will be updated as necessary and the project will comply in full with all requirements of the licensing regime in place. The surface water undergoes a settlement treatment process before being combined with seawater and is then discharged to sea via licenced emission point, SW1.</p> <p>There is 1 no. existing storm water discharge point to the Boyne River at the main entrance to the site. An attenuation/soakaway will be installed close to the location where the drainage leaves the site. The soakaway will be sized to accommodate a 100 year rainfall event including a 20% climate change safety factor, and store all the water, resulting in no discharge from the existing discharge point to the Boyne River for rainfall events less than 100 years. This water will discharge to groundwater by infiltration. An overflow will be connected to the existing outfall for cases where the inflow exceeds the 100 year rainfall events. The overflow will be fitted with a bypass separator to filter out any hydrocarbons.</p> <p>The Site Environmental Management System (EMS) and Site Protection Management Plan (SPMP) under the site's IE will include site maintenance, which will involve infrastructure performance checks that will capture integrity loss in drainage systems and secondary forms of containment. If an effect is identified under the licence, remediation would be undertaken.</p> <p>The existing site emergency response procedure will be updated to include the Proposed Development. Trained emergency response and spill response teams are in place at the site. Emergency Stop Devices (ESD's), activated locally or remotely, will close all of the controls valves to automatically shutdown station in less than 5 seconds</p> <p><b><u>Mitigation against Fire/Explosion (Op2)</u></b></p> <p>No significant quantities of flammable material will be used or stored on the site.</p> <p>The occupied buildings will have the appropriate fire detection and abatement systems installed as per the relevant Building Regulations.</p> <p>BESS battery racks are monitored by a fire detection and suppression system. Cabinets will be UL1973 certified and compliant with NFPA855 and NFPA68.</p> <p>The BESS is external and will be provided with sealed concrete pavements with upstands to ensure that no contaminated runoff could discharge to, and potentially contaminate, surface water and/or groundwater. In the event of a fire at the BESS, firewater runoff will drain to the attenuation tank under the BESS. This retention tank will be fitted with a pH-controlled actuator on the outfall. Once contaminated water from a fire is detected, the outfall will close automatically turning it into a firewater run-off storage tank. A foul sewer will be installed under the DC and EC to collect potentially contaminated fire water runoff in the event of a fire. It is proposed to pump this water to the attenuation tank/contaminated water tank under the BESS. Contaminated firewater collected in the attenuation tank will be pumped out and removed off site in tankers.</p> <p><b><u>Monitoring during Construction Phase (Including Demolition)</u></b></p> <p>The monitoring measures to be carried out by the contractor during construction are detailed in the outline Construction and Environmental Management Plan (PM Group document reference no. IE0313391-22-RP-0003, Issue A). The monitoring relevant to the risks identified in this chapter are summarised in Table 16.12.</p> <p><b><u>Monitoring during Operational Phase</u></b></p> <p>As described in previous sections, the proposed site will operate under an IE Licence. This licence will detail significant monitoring measures. It is assumed that no additional monitoring will be necessary during the operational phase of the Proposed Development.</p> |                  |



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## Appendix A

### Chapter 8 Biodiversity Appendices

- Desktop Records
- Examples of Valuing Important Ecological Features
- Wintering Bird Survey Results
- Breeding Bird Survey Results

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## Desktop Records

Desktop records of protected, rare, or other notable fauna species are listed below in Tables A1-A4. Table A.1 relate to the Proposed Development Site, whilst Tables A2-A4 cover the three auxiliary sites (Barray reservoirs, Mell Quarry and Littlegrange abstraction site) discussed in the EIAR biodiversity chapter. In relation to amphibian, reptile and mammal species those which are protected under the Wildlife Acts, the Habitats Directive and/or are listed as threatened (Vulnerable to Critically Endangered) on the relevant national Red Lists are included. In the case of bird species, only those species listed in Annex I of the Birds Directive or on the Birds of Conservation Concern in Ireland (BoCCI) Red List are included in the table below. For invertebrate species, those which are listed as threatened (Vulnerable to Critically Endangered) on the relevant national Red List are included.

**Table A.1:** Desktop records within 2km Proposed Development Site

| Common Name<br>Scientific Name                         | Legal Status       | Species Red List Status or BoCCI status (for Birds) | Source                      | Location in Relation to Proposed Development (NBDC Grid Ref) | Date of Last Record |
|--------------------------------------------------------|--------------------|-----------------------------------------------------|-----------------------------|--------------------------------------------------------------|---------------------|
| <b>Amphibians</b>                                      |                    |                                                     |                             |                                                              |                     |
| Common Frog<br><i>Rana temporaria</i>                  | HD_V, WA           | Least concern                                       | NBDC online database record | Within 2km N (O17D)                                          | 04/04/2023          |
| Smooth Newt<br><i>Lissotriton vulgaris</i>             | WA                 |                                                     | NBDC online database record | Within 2km NE (O17I)                                         | 04/04/2018          |
| <b>Birds</b>                                           |                    |                                                     |                             |                                                              |                     |
| Barn Owl<br><i>Tyto alba</i>                           | WA                 | Red                                                 | NBDC online database record | Within 2km N (O17D)                                          | 31/12/2011          |
| Barn Swallow<br><i>Hirundo rustica</i>                 | WA                 | Amber                                               | NBDC online database record | Within 2km SE (O17H)                                         | 28/05/2018          |
| Black-headed Gull<br><i>Chroicocephalus ridibundus</i> | SCI_WA             | Amber                                               | NBDC online database record | Within 2km SE (O17H)                                         | 12/06/2017          |
| Black-tailed Godwit<br><i>Limosa limosa</i>            | SCI_WA             | Red                                                 | NBDC online database record | Within 2km SE (O17H)                                         | 26/12/2020          |
| Light-bellied Brent Goose<br><i>Branta bernicla</i>    | SCI_WA             | Amber                                               | NBDC online database record | Within 2km SE (O17H)                                         | 23/02/2019          |
| Common Coot<br><i>Fulica atra</i>                      | SCI_WA             | Amber                                               | NBDC online database record | Within 2km NE (O17I)                                         | 31/12/2011          |
| Common Goldeneye<br><i>Bucephala clangula</i>          | SCI_WA, BD_II (II) | Red                                                 | NBDC online database record | Within 2km NE (O17I)                                         | 31/12/2011          |
| Common Greenshank<br><i>Tringa nebularia</i>           | SCI_WA             | Green                                               | NBDC online database record | Within 2km NE (O17I)                                         | 04/12/2017          |

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| Common Name<br>Scientific Name                         | Legal Status                   | Species<br>Red List<br>Status or<br>BoCCI<br>status (for<br>Birds) | Source                         | Location in<br>Relation to<br>Proposed<br>Development<br>(NBDC Grid<br>Ref) | Date of<br>Last<br>Record |
|--------------------------------------------------------|--------------------------------|--------------------------------------------------------------------|--------------------------------|-----------------------------------------------------------------------------|---------------------------|
| Common Kestrel<br><i>Falco tinnunculus</i>             | WA                             | Red                                                                | NBDC online<br>database record | Within 2km S<br>(O17C)                                                      | 31/12/2011                |
| Common Linnet<br><i>Carduelis cannabina</i>            | WA                             | Amber (if<br>applicable)                                           | NBDC online<br>database record | Within 2km S<br>(O17C)                                                      | 31/12/2011                |
| Common Moorhen<br><i>Gallinula chloropus</i>           | WA                             | Green                                                              | NBDC online<br>database record | Within 2km NE<br>(O17I)                                                     | 27/04/2023                |
| Common Redshank<br><i>Tringa totanus</i>               | SCI_WA                         | Red                                                                | NBDC online<br>database record | Within 2km NE<br>(O17I)                                                     | 22/01/2023                |
| Common Shelduck<br><i>Tadorna tadorna</i>              | SCI_WA                         | Amber                                                              | NBDC online<br>database record | Within 2km SE<br>(O17H)                                                     | 22/01/2023                |
| Common Snipe<br><i>Gallinago gallinago</i>             | WA, BD_II (I), III<br>(III)    | Red                                                                | NBDC online<br>database record | Within 2km N<br>(O17D)                                                      | 31/12/2011                |
| Common Starling<br><i>Sturnus vulgaris</i>             | WA                             | Amber                                                              | NBDC online<br>database record | Within 2km S<br>(O17C)                                                      | 03/04/2023                |
| Common Swift<br><i>Apus apus</i>                       | WA                             | Red                                                                | NBDC online<br>database record | Within 2km S<br>(O17C)                                                      | 31/07/1991                |
| Common Wood Pigeon<br><i>Columba palumbus</i>          | WA, BD_II (I), III<br>(I)      | Green                                                              | NBDC online<br>database record | Within 2km S<br>(O17C)                                                      | 28/04/2019                |
| Dunlin<br><i>Calidris alpina</i>                       | SCI_WA, BD_I                   | Red                                                                | NBDC online<br>database record | Within 2km NE<br>(O17I)                                                     | 16/02/2019                |
| Eurasian Curlew<br><i>Numenius arquata</i>             | SCI_WA, BD_II<br>(II)          | Red                                                                | NBDC online<br>database record | Within 2km NE<br>(O17I)                                                     | 22/01/2023                |
| Eurasian Oystercatcher<br><i>Haematopus ostralegus</i> | SCI_WA                         | Red                                                                | NBDC online<br>database record | Within 2km N<br>(O17D)                                                      | 23/02/2019                |
| Eurasian Teal<br><i>Anas crecca</i>                    | SCI_WA, BD_II<br>(I) III (II)  | Amber                                                              | NBDC online<br>database record | Within 2km NE<br>(O17I)                                                     | 27/04/2023                |
| Eurasian Tree Sparrow<br><i>Passer montanus</i>        | WA                             | Amber                                                              | NBDC online<br>database record | Within 2km S<br>(O17C)                                                      | 08/04/2023                |
| Eurasian Wigeon<br><i>Anas penelope</i>                | SCI_WA, BD_II<br>(I), III (II) | Amber                                                              | NBDC online<br>database record | Within 2km NE<br>(O17I)                                                     | 22/01/2023                |

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| Common Name<br>Scientific Name                       | Legal Status               | Species<br>Red List<br>Status or<br>BoCCI<br>status (for<br>Birds) | Source                      | Location in<br>Relation to<br>Proposed<br>Development<br>(NBDC Grid<br>Ref) | Date of<br>Last<br>Record |
|------------------------------------------------------|----------------------------|--------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------|---------------------------|
| European Golden Plover<br><i>Pluvialis apricaria</i> | SCI_WA, BD_I, II (II)      | Red                                                                | NBDC online database record | Within 2km NE (O17I)                                                        | 16/02/2019                |
| European Shag<br><i>Phalacrocorax aristotelis</i>    | SCI_WA                     | Amber                                                              | NBDC online database record | Within 2km NE (O17I)                                                        | 12/06/2017                |
| Gadwall<br><i>Anas strepera</i>                      | SCI_WA                     | Amber                                                              | NBDC online database record | Within 2km NE (O17I)                                                        | 31/12/2011                |
| Great Black-backed Gull<br><i>Larus marinus</i>      | WA                         | Green                                                              | NBDC online database record | Within 2km NE (O17I)                                                        | 27/05/2019                |
| Great Cormorant<br><i>Phalacrocorax carbo</i>        | SCI_WA                     | Amber                                                              | NBDC online database record | Within 2km NE (O17I)                                                        | 23/02/2019                |
| Great Crested Grebe<br><i>Podiceps cristatus</i>     | SCI_WA                     | Amber                                                              | NBDC online database record | Within 2km NE (O17I)                                                        | 31/12/2011                |
| Grey Heron<br><i>Ardea cinerea</i>                   | SCI_WA                     | Green                                                              | NBDC online database record | Within 2km NE (O17I)                                                        | 27/04/2023                |
| Herring Gull<br><i>Larus argentatus</i>              | SCI_WA                     | Amber                                                              | NBDC online database record | Within 2km NE (O17I)                                                        | 12/06/2017                |
| House Martin<br><i>Delichon urbicum</i>              | WA                         | Amber                                                              | NBDC online database record | Within 2km S (O17C)                                                         | 31/07/1991                |
| House Sparrow<br><i>Passer domesticus</i>            | WA                         | Amber                                                              | NBDC online database record | Within 2km S (O17C)                                                         | 23/04/2023                |
| Little Egret<br><i>Egretta garzetta</i>              | WA, BD_I                   | Green                                                              | NBDC online database record | Within 2km NE (O17I)                                                        | 27/04/2023                |
| Little Grebe<br><i>Tachybaptus ruficollis</i>        | SCI_WA                     | Green                                                              | NBDC online database record | Within 2km NE (O17I)                                                        | 23/02/2019                |
| Little Tern<br><i>Sternula albifrons</i>             | SCI_WA, BD_I               | Amber                                                              | NBDC online database record | Within 2km SE (O17H)                                                        | 31/12/2011                |
| Mallard<br><i>Anas platyrhynchos</i>                 | SCI_WA, BD_II (I), III (I) | Amber                                                              | NBDC online database record | Within 2km NE (O17I)                                                        | 27/04/2023                |
| Mew Gull<br><i>Larus canus</i>                       | SCI_WA                     | Amber                                                              | NBDC online database record | Within 2km N (O17D)                                                         | 31/12/2011                |
| Mute Swan<br><i>Cygnus olor</i>                      | WA                         | Amber                                                              | NBDC online database record | Within 2km NE (O17I)                                                        | 27/04/2023                |

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| Common Name<br>Scientific Name                         | Legal Status                 | Species<br>Red List<br>Status or<br>BoCCI<br>status (for<br>Birds) | Source                      | Location in<br>Relation to<br>Proposed<br>Development<br>(NBDC Grid<br>Ref) | Date of<br>Last<br>Record |
|--------------------------------------------------------|------------------------------|--------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------|---------------------------|
| Northern Lapwing<br><i>Vanellus vanellus</i>           | SCI_WA, BD_II (II)           | Red                                                                | NBDC online database record | Within 2km NE (O17I)                                                        | 22/01/2023                |
| Northern Pintail<br><i>Anas acuta</i>                  | SCI_WA                       | Amber                                                              | NBDC online database record | Within 2km NE (O17I)                                                        | 31/12/2011                |
| Northern Shoveler<br><i>Anas clypeata</i>              | SCI_WA, BD_II (I), III (III) | Red                                                                | NBDC online database record | Within 2km NE (O17I)                                                        | 31/12/2011                |
| Ringed Plover<br><i>Charadrius hiaticula</i>           | SCI_WA                       | Amber                                                              | NBDC online database record | Within 2km NE (O17I)                                                        | 28/05/2018                |
| Sand Martin<br><i>Riparia riparia</i>                  | WA                           | Amber                                                              | NBDC online database record | Within 2km S (O17C)                                                         | 31/12/2011                |
| Sandwich Tern<br><i>Sterna sandvicensis</i>            | SCI_WA, BD_I                 | Amber                                                              | NBDC online database record | Within 2km NE (O17I)                                                        | 14/05/2018                |
| Sky Lark<br><i>Alauda arvensis</i>                     | WA                           | Amber                                                              | NBDC online database record | Within 2km NE (O17I)                                                        | 05/06/2018                |
| Spotted Flycatcher<br><i>Muscicapa striata</i>         | WA                           | Amber                                                              | NBDC online database record | Within 2km N (O17D)                                                         | 31/12/2011                |
| Stock Pigeon<br><i>Columba oenas</i>                   | WA                           | Red                                                                | NBDC online database record | Within 2km S (O17C)                                                         | 31/12/2011                |
| Whooper Swan<br><i>Cygnus cygnus</i>                   | SCI_WA, BD_I                 | Amber                                                              | NBDC online database record | Within 2km S (O17C)                                                         | 31/12/2011                |
| Yellowhammer<br><i>Emberiza citrinella</i>             | WA                           | Red                                                                | NBDC online database record | Within 2km NE (O17I)                                                        | 11/07/2021                |
| <b>Mammal</b>                                          |                              |                                                                    |                             |                                                                             |                           |
| Common Seal<br><i>Phoca vitulina</i>                   | HD_WA_II_V                   |                                                                    | NBDC online database record | Within 2km NE (O17I)                                                        | 16/02/2019                |
| Grey Seal<br><i>Halichoerus grypus</i>                 | HD_WA_II_V                   |                                                                    | NBDC online database record | Within 2km NE (O17I)                                                        | 27/08/2018                |
| Brown Long-eared Bat<br><i>Plecotus auritus</i>        | HD_WA_IV                     |                                                                    | NBDC online database record | Within 2km NE (O17I)                                                        | 25/06/1998                |
| Common Pipistrelle<br><i>Pipistrellus pipistrellus</i> | HD_WA_IV                     |                                                                    | NBDC online database record | Within 2km NE (O17I)                                                        | 15/07/2008                |



| Common Name<br>Scientific Name                                    | Legal Status | Species<br>Red List<br>Status or<br>BoCCI<br>status (for<br>Birds) | Source                         | Location in<br>Relation to<br>Proposed<br>Development<br>(NBDC Grid<br>Ref) | Date of<br>Last<br>Record |
|-------------------------------------------------------------------|--------------|--------------------------------------------------------------------|--------------------------------|-----------------------------------------------------------------------------|---------------------------|
| Daubenton's Bat<br><i>Myotis daubentonii</i>                      | HD_WA_IV     |                                                                    | NBDC online<br>database record | Within 2km NE<br>(O17I)                                                     | 06/08/2012                |
| Eurasian Badger<br><i>Meles meles</i>                             | WA           |                                                                    | NBDC online<br>database record | Within 2km S<br>(O17C)                                                      | 24/04/2009                |
| European Otter<br><i>Lutra lutra</i>                              | HD_WA_II_IV  |                                                                    | NBDC online<br>database record | Within 2km NE<br>(O17I)                                                     | 22/07/2012                |
| Irish Hare<br><i>Lepus timidus</i><br>subsp.<br><i>hibernicus</i> |              |                                                                    | NBDC online<br>database record | Within 2km NE<br>(O17I)                                                     | 09/05/2009                |
| Pine Marten<br><i>Martes martes</i>                               | HD_WA_V      |                                                                    | NBDC online<br>database record | Within 2km N<br>(O17D)                                                      | 12/06/2021                |
| Red Fox<br><i>Vulpes vulpes</i>                                   |              |                                                                    | NBDC online<br>database record | Within 2km S<br>(O17C)                                                      | 22/10/2011                |
| Soprano<br>Pipistrelle<br><i>Pipistrellus pygmaeus</i>            | HD_WA_IV     |                                                                    | NBDC online<br>database record | Within 2km NE<br>(O17I)                                                     | 15/07/2008                |
| West European<br>Hedgehog<br><i>Erinaceus europaeus</i>           | WA           |                                                                    | NBDC online<br>database record | Within 2km S<br>(O17C)                                                      | 07/09/2022                |

**Table A.2:** Desktop records within 2km of Baltray Reservoir

| Common Name<br>Scientific Name               | Legal Status | Species<br>Red List<br>Status or<br>BoCCI<br>status (for<br>Birds) | Source                         | Location in<br>Relation to<br>Baltray<br>Reservoir<br>(NBDC Grid<br>Ref) | Date of Last<br>Record |
|----------------------------------------------|--------------|--------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------|------------------------|
| <b>Bird</b>                                  |              |                                                                    |                                |                                                                          |                        |
| Barn Swallow<br><i>Hirundo rustica</i>       | WA           | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 10/06/2022             |
| Bar-tailed Godwit<br><i>Limosa lapponica</i> | SCI_WA, BD_I | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 05/01/2018             |
| Black Guillemot<br><i>Cephus grylle</i>      | WA           | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 27/08/2018             |

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| Common Name<br>Scientific Name                             | Legal Status                     | Species<br>Red List<br>Status or<br>BoCCI<br>status (for<br>Birds) | Source                         | Location in<br>Relation to<br>Baltray<br>Reservoir<br>(NBDC Grid<br>Ref) | Date of Last<br>Record |
|------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------|------------------------|
| Black-headed Gull<br><i>Chroicocephalus<br/>ridibundus</i> | SCI_WA                           | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 04/05/2021             |
| Black-tailed<br>Godwit<br><i>Limosa limosa</i>             | SCI_WA                           | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 16/02/2019             |
| Light-bellied Brent<br>Goose<br><i>Branta bernicla</i>     | SCI_WA                           | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 02/04/2023             |
| Common<br>Goldeneye<br><i>Bucephala<br/>clangula</i>       | SCI_WA, BD_II<br>(II)            | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2001             |
| Common<br>Greenshank<br><i>Tringa nebularia</i>            | SCI_WA                           | Green                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2001             |
| Common Kestrel<br><i>Falco tinnunculus</i>                 | WA                               | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 25/07/2018             |
| Common<br>Kingfisher<br><i>Alcedo atthis</i>               | SCI, WA, BD_I                    | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2001             |
| Common Linnet<br><i>Carduelis<br/>cannabina</i>            | WA                               | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 19/05/2023             |
| Common<br>Moorhen<br><i>Gallinula<br/>chloropus</i>        | WA                               | Green                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2001             |
| Common Pochard<br><i>Aythya ferina</i>                     | SCI_WA                           | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2001             |
| Common<br>Redshank<br><i>Tringa totanus</i>                | SCI_WA                           | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 16/02/2019             |
| Common<br>Sandpiper <i>Actitis<br/>hypoleucos</i>          | WA                               | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 10/07/2018             |
| Common Scoter<br><i>Melanitta nigra</i>                    | SCI_WA, BD_II<br>(II), III (III) | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 05/01/2018             |
| Common<br>Shelduck<br><i>Tadorna tadorna</i>               | SCI_WA                           | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 02/04/2023             |
| Common Snipe<br><i>Gallinago<br/>gallinago</i>             | WA, BD_II (I), III<br>(III)      | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2011             |

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| Common Name<br>Scientific Name                                | Legal Status                   | Species<br>Red List<br>Status or<br>BoCCI<br>status (for<br>Birds) | Source                         | Location in<br>Relation to<br>Baltray<br>Reservoir<br>(NBDC Grid<br>Ref) | Date of Last<br>Record |
|---------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------|------------------------|
| Common Starling<br><i>Sturnus vulgaris</i>                    | WA                             | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 29/06/2018             |
| Common Wood<br>Pigeon <i>Columba<br/>palumbus</i>             | WA, BD_II (I), III<br>(I)      | Green                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 02/04/2023             |
| Curlew Sandpiper<br><i>Calidris ferruginea</i>                | WA                             | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2001             |
| Dunlin<br><i>Calidris alpina</i>                              | SCI_ WA, BD_I                  | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 04/05/2021             |
| Eurasian Collared<br>Dove <i>Streptopelia<br/>decaocto</i>    | WA                             | Green                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 10/07/2018             |
| Eurasian Curlew<br><i>Numenius arquata</i>                    | SCI_ WA, BD_II<br>(II)         | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 02/04/2023             |
| Eurasian<br>Oystercatcher<br><i>Haematopus<br/>ostralegus</i> | SCI_WA                         | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 02/04/2023             |
| Eurasian Teal<br><i>Anas crecca</i>                           | SCI_WA, BD_II<br>(I) III (II)  | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 02/02/2019             |
| Eurasian Tree<br>Sparrow<br><i>Passer montanus</i>            | WA                             | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2011             |
| Eurasian Wigeon<br><i>Anas penelope</i>                       | SCI_WA, BD_II<br>(I), III (II) | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 02/04/2023             |
| European Golden<br>Plover <i>Pluvialis<br/>apricaria</i>      | SCI_ WA, BD_I,<br>II (II)      | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 22/02/2018             |
| Great Black-<br>backed Gull<br><i>Larus marinus</i>           | WA                             | Green                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 03/06/2019             |
| Great Cormorant<br><i>Phalacrocorax<br/>carbo</i>             | SCI_WA                         | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 19/05/2023             |
| Great Crested<br>Grebe<br><i>Podiceps cristatus</i>           | SCI_WA                         | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2001             |
| Great Northern<br>Diver <i>Gavia<br/>immer</i>                | SCI_ WA, BD_I                  | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2001             |

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| Common Name<br>Scientific Name                            | Legal Status                  | Species<br>Red List<br>Status or<br>BoCCI<br>status (for<br>Birds) | Source                         | Location in<br>Relation to<br>Baltray<br>Reservoir<br>(NBDC Grid<br>Ref) | Date of Last<br>Record |
|-----------------------------------------------------------|-------------------------------|--------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------|------------------------|
| Great Skua<br><i>Stercorarius skua</i>                    | WA                            | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 24/07/2019             |
| Greater White-<br>fronted Goose<br><i>Anser albifrons</i> | SCI_WA, BD_I                  | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2001             |
| Grey Heron<br><i>Ardea cinerea</i>                        | SCI_WA                        | Green                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 10/07/2018             |
| Grey Plover<br><i>Pluvialis<br/>squatarola</i>            | SCI_WA                        | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 02/02/2019             |
| Greylag Goose<br><i>Anser anser</i>                       | SCI_WA                        | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2001             |
| Herring Gull<br><i>Larus argentatus</i>                   | SCI_WA                        | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 04/05/2021             |
| House Martin<br><i>Delichon urbicum</i>                   | WA                            | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 18/05/2018             |
| House Sparrow<br><i>Passer<br/>domesticus</i>             | WA                            | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 10/07/2018             |
| Jack Snipe<br><i>Lymnocyptes<br/>minimus</i>              | WA                            | Green                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2011             |
| Lesser Black-<br>backed Gull <i>Larus<br/>fuscus</i>      | SCI_WA                        | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 19/04/2018             |
| Little Egret<br><i>Egretta garzetta</i>                   | WA, BD_I                      | Green                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 17/02/2018             |
| Little Grebe<br><i>Tachybaptus<br/>ruficollis</i>         | SCI_WA                        | Green                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2001             |
| Little Tern<br><i>Sternula albifrons</i>                  | SCI_WA, BD_I                  | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 19/05/2023             |
| Mallard<br><i>Anas<br/>platyrhynchos</i>                  | SCI_WA, BD_II<br>(I), III (I) | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 02/02/2019             |
| Merlin<br><i>Falco columbarius</i>                        | SCI_WA, BD_I                  | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/07/1991             |

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| Common Name<br>Scientific Name                       | Legal Status                    | Species<br>Red List<br>Status or<br>BoCCI<br>status (for<br>Birds) | Source                         | Location in<br>Relation to<br>Baltray<br>Reservoir<br>(NBDC Grid<br>Ref) | Date of Last<br>Record |
|------------------------------------------------------|---------------------------------|--------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------|------------------------|
| Mew Gull<br><i>Larus canus</i>                       | SCI_WA                          | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 10/07/2018             |
| Mute Swan<br><i>Cygnus olor</i>                      | WA                              | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 27/08/2018             |
| Northern Lapwing<br><i>Vanellus vanellus</i>         | SCI_WA, BD_II<br>(II)           | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 16/02/2019             |
| Northern Pintail<br><i>Anas acuta</i>                | SCI_WA                          | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2011             |
| Northern Shoveler<br><i>Anas clypeata</i>            | SCI_WA, BD_II<br>(I), III (III) | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2001             |
| Northern<br>Wheatear<br><i>Oenanthe<br/>oenanthe</i> | WA                              | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 21/08/2022             |
| Red Knot<br><i>Calidris canutus</i>                  | WA                              | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 04/05/2021             |
| Red-breasted<br>Merganser<br><i>Mergus serrator</i>  | SCI_WA, BD_II<br>(II)           | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2011             |
| Ringed Plover<br><i>Charadrius<br/>hiaticula</i>     | SCI_WA                          | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 24/07/2019             |
| Ruff<br><i>Calidris pugnax</i>                       | WA, BD_I                        | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2001             |
| Sand Martin<br><i>Riparia riparia</i>                | WA                              | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 05/04/2016             |
| Sanderling<br><i>Calidris alba</i>                   | SCI_WA                          | Green                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 09/04/2022             |
| Sandwich Tern<br><i>Sterna<br/>sandvicensis</i>      | SCI_WA, BD_I                    | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 24/07/2019             |
| Short-eared Owl<br><i>Asio flammeus</i>              | WA, BD_I                        | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2011             |
| Sky Lark<br><i>Alauda arvensis</i>                   | WA                              | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 19/05/2023             |



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| Common Name<br>Scientific Name                                   | Legal Status                   | Species<br>Red List<br>Status or<br>BoCCI<br>status (for<br>Birds) | Source                         | Location in<br>Relation to<br>Baltray<br>Reservoir<br>(NBDC Grid<br>Ref) | Date of Last<br>Record |
|------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------|------------------------|
| Tufted Duck<br><i>Aythya fuligula</i>                            | SCI_WA, BD_II<br>(I), III (II) | Amber                                                              | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 31/12/2001             |
| Velvet Scoter<br><i>Melanitta fusca</i>                          | WA                             | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 17/09/2016             |
| Yellowhammer<br><i>Emberiza citrinella</i>                       | WA                             | Red                                                                | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 02/04/2023             |
| <b>Flora</b>                                                     |                                |                                                                    |                                |                                                                          |                        |
| Hound's-tongue<br><i>Cynoglossum<br/>officinale</i>              |                                | Near<br>Threatened                                                 | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 29/06/2018             |
| Pointed Beard-<br>moss <i>Didymodon<br/>acutus</i>               | FPO                            | Endangered                                                         | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 12/09/2007             |
| Side-fruited Crisp-<br>moss<br><i>Pleurochaete<br/>squarrosa</i> |                                | Near<br>Threatened                                                 | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 12/09/2007             |
| <b>Mammal</b>                                                    |                                |                                                                    |                                |                                                                          |                        |
| Common Dolphin<br><i>Delphinus delphis</i>                       | HD_WA_IV                       |                                                                    | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 01/08/1914             |
| Common<br>Porpoise<br><i>Phocoena<br/>phocoena</i>               | HD_WA_II_IV                    | Threatened                                                         | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 26/06/2019             |
| Common Seal<br><i>Phoca vitulina</i>                             | HD_WA_II_V                     |                                                                    | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 05/01/2018             |
| Grey Seal<br><i>Halichoerus<br/>grypus</i>                       | HD_WA_II_V                     |                                                                    | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 23/05/2018             |
| Minke Whale<br><i>Balaenoptera<br/>acutorostrata</i>             | HD_WA_IV                       |                                                                    | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 10/07/2018             |
| Striped Dolphin<br><i>Stenella<br/>coeruleoalba</i>              | HD_WA_IV                       |                                                                    | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 02/09/2006             |
| European Otter<br><i>Lutra lutra</i>                             | HD_WA_II_IV                    |                                                                    | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 10/12/2014             |
| Irish Hare<br><i>Lepus timidus<br/>subsp. hibernicus</i>         |                                |                                                                    | NBDC online<br>database record | Within 2km of<br>site<br>(O17N)                                          | 08/07/2013             |

| Common Name<br>Scientific Name                                   | Legal Status | Species Red List Status or BoCCI status (for Birds) | Source                      | Location in Relation to Baltray Reservoir (NBDC Grid Ref) | Date of Last Record |
|------------------------------------------------------------------|--------------|-----------------------------------------------------|-----------------------------|-----------------------------------------------------------|---------------------|
| Irish Stoat<br><i>Mustela erminea</i><br><i>subsp. hibernica</i> |              |                                                     | NBDC online database record | Within 2km of site (O17N)                                 | 22/06/2013          |
| Red Fox<br><i>Vulpes vulpes</i>                                  |              |                                                     | NBDC online database record | Within 2km of site (O17N)                                 | 27/06/2013          |
| West European Hedgehog<br><i>Erinaceus europaeus</i>             | WA           |                                                     | NBDC online database record | Within 2km of site (O17N)                                 | 18/07/2022          |
| <b>Reptile</b>                                                   |              |                                                     |                             |                                                           |                     |
| Common Lizard<br><i>Zootoca vivipara</i>                         | WA           |                                                     | NBDC online database record | Within 2km of site (O17N)                                 | 20/06/2020          |

**Table A.3:** Desktop Records within 2km of Littlegrange site

| Common Name<br>Scientific Name               | Legal Status | Species Red List Status or BoCCI status (for Birds) | Source                      | Location in Relation to Little Grange (NBDC Grid Ref) | Date of Last Record |
|----------------------------------------------|--------------|-----------------------------------------------------|-----------------------------|-------------------------------------------------------|---------------------|
| <b>Birds</b>                                 |              |                                                     |                             |                                                       |                     |
| Barn Swallow<br><i>Hirundo rustica</i>       | WA           | Amber                                               | NBDC online database record | Within 2km W (O07H)                                   | 02/05/2018          |
| Common Greenshank<br><i>Tringa nebularia</i> | SCI_WA       | Green                                               | NBDC online database record | Within 2km E (O07M)                                   | 31/12/2011          |
| Common Kestrel<br><i>Falco tinnunculus</i>   | WA           | Red                                                 | NBDC online database record | Within 2km E (O07M)                                   | 28/02/2016          |
| Common Kingfisher<br><i>Alcedo atthis</i>    | SCI_WA, BD_I | Amber                                               | NBDC online database record | Within 2km W (O07H)                                   | 22/05/2010          |
| Common Linnet<br><i>Carduelis cannabina</i>  | WA           | Amber                                               | NBDC online database record | Within 2km E (O07M)                                   | 31/12/2011          |

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| Common Name<br>Scientific Name                  | Legal Status           | Species Red List Status or BoCCI status (for Birds) | Source                      | Location in Relation to Little Grange (NBDC Grid Ref) | Date of Last Record |
|-------------------------------------------------|------------------------|-----------------------------------------------------|-----------------------------|-------------------------------------------------------|---------------------|
| Common Moorhen<br><i>Gallinula chloropus</i>    | WA                     | Green                                               | NBDC online database record | Within 2km W (O07H)                                   | 17/01/2018          |
| Common Redshank<br><i>Tringa totanus</i>        | SCI_WA                 | Red                                                 | NBDC online database record | Within 2km E (O07M)                                   | 31/12/2011          |
| Common Starling<br><i>Sturnus vulgaris</i>      | WA                     | Amber                                               | NBDC online database record | Within 2km E (O07M)                                   | 31/12/2011          |
| Common Swift<br><i>Apus apus</i>                | WA                     | Red                                                 | NBDC online database record | Within 2km E (O07M)                                   | 31/12/2011          |
| Common Wood Pigeon<br><i>Columba palumbus</i>   | WA, BD_II (I), III (I) | Green                                               | NBDC online database record | Within 2km E (O07M)                                   | 31/12/2011          |
| Eurasian Tree Sparrow<br><i>Passer montanus</i> | WA                     | Amber                                               | NBDC online database record | Within 2km E (O07M)                                   | 31/12/2011          |
| Great Cormorant<br><i>Phalacrocorax carbo</i>   | SCI_WA                 | Amber                                               | NBDC online database record | Within 2km W (O07H)                                   | 17/01/2018          |
| Grey Heron<br><i>Ardea cinerea</i>              | SCI_WA                 | Green                                               | NBDC online database record | Within 2km W (O07H)                                   | 31/12/2011          |
| Herring Gull<br><i>Larus argentatus</i>         | SCI_WA                 | Amber                                               | NBDC online database record | Within 2km E (O07M)                                   | 31/12/2011          |
| House Martin<br><i>Delichon urbicum</i>         | WA                     | Amber                                               | NBDC online database record | Within 2km E (O07M)                                   | 31/12/2011          |
| House Sparrow<br><i>Passer domesticus</i>       | WA                     | Amber                                               | NBDC online database record | Within 2km E (O07M)                                   | 31/12/2011          |
| Little Egret<br><i>Egretta garzetta</i>         | WA, BD_I               | Green                                               | NBDC online database record | Within 2km E (O07M)                                   | 24/03/2014          |

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| Common Name<br>Scientific Name                         | Legal Status               | Species Red List Status or BoCCI status (for Birds) | Source                      | Location in Relation to Little Grange (NBDC Grid Ref) | Date of Last Record |
|--------------------------------------------------------|----------------------------|-----------------------------------------------------|-----------------------------|-------------------------------------------------------|---------------------|
| Mallard<br><i>Anas platyrhynchos</i>                   | SCI_WA, BD_II (I), III (I) | Amber                                               | NBDC online database record | Within 2km W (O07H)                                   | 31/12/2011          |
| Mute Swan<br><i>Cygnus olor</i>                        | WA                         | Amber                                               | NBDC online database record | Within 2km W (O07H)                                   | 22/05/2010          |
| Northern Lapwing<br><i>Vanellus vanellus</i>           | SCI_WA, BD_II (II)         | Red                                                 | NBDC online database record | Within 2km E (O07M)                                   | 18/11/2022          |
| Sand Martin<br><i>Riparia riparia</i>                  | WA                         | Amber                                               | NBDC online database record | Within 2km W (O07H)                                   | 25/04/2010          |
| Sky Lark<br><i>Alauda arvensis</i>                     | WA                         | Amber                                               | NBDC online database record | Within 2km E (O07M)                                   | 31/12/2011          |
| Spotted Flycatcher<br><i>Muscicapa striata</i>         | WA                         | Amber                                               | NBDC online database record | Within 2km E (O07M)                                   | 31/12/2011          |
| Yellowhammer<br><i>Emberiza citrinella</i>             | WA                         | Red                                                 | NBDC online database record | Within 2km W (O07H)                                   | 05/11/2016          |
| <b>Fish</b>                                            |                            |                                                     |                             |                                                       |                     |
| European Eel<br><i>Anguilla anguilla</i>               | OSPAR I, II, III, IV       | Critically Endangered                               | NBDC online database record | Within 2km W (O07H)                                   | 03/07/2006          |
| <b>Mammal</b>                                          |                            |                                                     |                             |                                                       |                     |
| Brown Long-eared Bat<br><i>Plecotus auritus</i>        | HD_WA_IV                   |                                                     | NBDC online database record | Within 2km E (O07M)                                   | 14/09/2017          |
| Common Pipistrelle<br><i>Pipistrellus pipistrellus</i> | HD_WA_IV                   |                                                     | NBDC online database record | Within 2km E (O07M)                                   | 13/05/2003          |
| Daubenton's Bat<br><i>Myotis daubentonii</i>           | HD_WA_IV                   |                                                     | NBDC online database record | Within 2km E (O07M)                                   | 13/09/2017          |

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| Common Name<br>Scientific Name                              | Legal Status | Species Red List Status or BoCCI status (for Birds) | Source                      | Location in Relation to Little Grange (NBDC Grid Ref) | Date of Last Record |
|-------------------------------------------------------------|--------------|-----------------------------------------------------|-----------------------------|-------------------------------------------------------|---------------------|
| Eastern Grey Squirrel<br><i>Sciurus carolinensis</i>        |              |                                                     | NBDC online database record | Within 2km E (O07M)                                   | 11/06/1981          |
| Eurasian Badger<br><i>Meles meles</i>                       | WA           |                                                     | NBDC online database record | Within 2km W (O07H)                                   | 30/07/2015          |
| European Otter<br><i>Lutra lutra</i>                        | HD_WA_II_IV  |                                                     | NBDC online database record | Within 2km W (O07H)                                   | 16/09/2018          |
| Irish Hare<br><i>Lepus timidus</i> subsp. <i>hibernicus</i> |              |                                                     | NBDC online database record | Within 2km W (O07H)                                   | 02/08/2018          |
| Lesser Noctule<br><i>Nyctalus leisleri</i>                  | HD_WA_IV     |                                                     | NBDC online database record | Within 2km E (O07M)                                   | 13/09/2017          |
| Pine Marten<br><i>Martes martes</i>                         | HD_WA_V      |                                                     | NBDC online database record | Within 2km E (O07M)                                   | 07/08/2018          |
| Pipistrelle<br><i>Pipistrellus pipistrellus sensu lato</i>  | HD_WA_IV     |                                                     | NBDC online database record | Within 2km E (O07M)                                   | 04/06/2015          |
| Red Deer<br><i>Cervus elaphus</i>                           | WA           |                                                     | NBDC online database record | Within 2km E (O07M)                                   | 15/06/2015          |
| Soprano Pipistrelle<br><i>Pipistrellus pygmaeus</i>         | HD_WA_IV     |                                                     | NBDC online database record | Within 2km E (O07M)                                   | 14/09/2017          |
| West European Hedgehog<br><i>Erinaceus europaeus</i>        | WA           |                                                     | NBDC online database record | Within 2km W (O07H)                                   | 29/08/2011          |
| <b>Reptile</b>                                              |              |                                                     |                             |                                                       |                     |
| Common Lizard<br><i>Zootoca vivipara</i>                    | WA           |                                                     | NBDC online database record | Within 2km E (O07M)                                   | 01/09/1974          |



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**Table A.4:** Desktop Records within 2km of Mell Quarry

| Common Name<br><i>Scientific Name</i>         | Legal Status             | Species Red List Status or BoCCI status (for Birds) | Source                      | Location in Relation to Mell Quarry (NBDC Grid Ref) | Date of Last Record |
|-----------------------------------------------|--------------------------|-----------------------------------------------------|-----------------------------|-----------------------------------------------------|---------------------|
| <b>Amphibian</b>                              |                          |                                                     |                             |                                                     |                     |
| Common Frog<br><i>Rana temporaria</i>         | HD_V, WA                 | Least concern                                       | NBDC online database record | Within 2km SW (O07S)                                | 09/03/2003          |
| Smooth Newt<br><i>Lissotriton vulgaris</i>    | WA                       |                                                     | NBDC online database record | Within 2km SW (O07S)                                | 04/07/2013          |
| <b>Bird</b>                                   |                          |                                                     |                             |                                                     |                     |
| Barn Swallow<br><i>Hirundo rustica</i>        | WA                       | Amber                                               | NBDC online database record | Within 2km SW (O07S)                                | 22/06/2022          |
| Black-headed Gull<br><i>Larus ridibundus</i>  | SCI_WA                   | Amber                                               | NBDC online database record | Within 2km SW (O07S)                                | 22/05/2018          |
| Common Coot<br><i>Fulica atra</i>             | SCI_WA                   | Amber                                               | NBDC online database record | Within 2km SW (O07S)                                | 03/03/2023          |
| Common Goldeneye<br><i>Bucephala clangula</i> | SCI_WA, BD_II (II)       | Red                                                 | NBDC online database record | Within 2km SW (O07S)                                | 31/12/2011          |
| Common Kestrel<br><i>Falco tinnunculus</i>    | WA                       | Red                                                 | NBDC online database record | Within 2km SW (O07S)                                | 31/12/2011          |
| Common Linnet<br><i>Carduelis cannabina</i>   | WA                       | Amber                                               | NBDC online database record | Within 2km SW (O07S)                                | 31/03/2022          |
| Common Moorhen<br><i>Gallinula chloropus</i>  | WA                       | Green                                               | NBDC online database record | Within 2km SW (O07S)                                | 03/03/2023          |
| Common Pochard<br><i>Aythya ferina</i>        | SCI_WA                   | Red                                                 | NBDC online database record | Within 2km SW (O07S)                                | 22/06/2022          |
| Common Shelduck<br><i>Tadorna tadorna</i>     | SCI_WA                   | Amber                                               | NBDC online database record | Within 2km SW (O07S)                                | 02/05/2018          |
| Common Snipe<br><i>Gallinago gallinago</i>    | WA, BD_II (I), III (III) | Red                                                 | NBDC online database record | Within 2km SW (O07S)                                | 31/12/2011          |
| Common Starling<br><i>Sturnus vulgaris</i>    | WA                       | Amber                                               | NBDC online database record | Within 2km SW (O07S)                                | 02/07/2019          |
| Common Swift<br><i>Apus apus</i>              | WA                       | Red                                                 | NBDC online database record | Within 2km SW (O07S)                                | 02/08/2023          |

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| Common Name<br><i>Scientific Name</i>                  | Legal Status                | Species Red List Status or BoCCI status (for Birds) | Source                      | Location in Relation to Mell Quarry (NBDC Grid Ref) | Date of Last Record |
|--------------------------------------------------------|-----------------------------|-----------------------------------------------------|-----------------------------|-----------------------------------------------------|---------------------|
| Common Tern<br><i>Sterna hirundo</i>                   | SCI_WA, BD_I                | Amber                                               | NBDC online database record | Within 2km SW (O07S)                                | 10/07/2016          |
| Common Wood Pigeon<br><i>Columba palumbus</i>          | WA, BD_II (I), III (I)      | Green                                               | NBDC online database record | Within 2km SE (O07X)                                | 07/06/2019          |
| Eurasian Oystercatcher<br><i>Haematopus ostralegus</i> | SCI_WA                      | Red                                                 | NBDC online database record | Within 2km NE (O07Y)                                | 31/12/2011          |
| Eurasian Teal<br><i>Anas crecca</i>                    | SCI_WA, BD_II (I) III (II)  | Amber                                               | NBDC online database record | Within 2km NW (O07T)                                | 31/12/2001          |
| Eurasian Wigeon<br><i>Anas penelope</i>                | SCI_WA, BD_II (I), III (II) | Amber                                               | NBDC online database record | Within 2km NW (O07T)                                | 21/06/2022          |
| Goosander<br><i>Mergus merganser</i>                   | WA                          | Amber                                               | NBDC online database record | Within 2km NW (O07T)                                | 31/12/2001          |
| Great Black-backed Gull<br><i>Larus marinus</i>        | WA                          | Green                                               | NBDC online database record | Within 2km SW (O07S)                                | 22/05/2018          |
| Great Cormorant<br><i>Phalacrocorax carbo</i>          | SCI_WA                      | Amber                                               | NBDC online database record | Within 2km SW (O07S)                                | 22/05/2018          |
| Great Crested Grebe<br><i>Podiceps cristatus</i>       | SCI_WA                      | Amber                                               | NBDC online database record | Within 2km NW (O07T)                                | 31/12/2011          |
| Grey Heron<br><i>Ardea cinerea</i>                     | SCI_WA                      | Green                                               | NBDC online database record | Within 2km SW (O07S)                                | 08/02/2018          |
| Herring Gull<br><i>Larus argentatus</i>                | SCI_WA                      | Amber                                               | NBDC online database record | Within 2km SW (O07S)                                | 03/03/2019          |
| House Martin<br><i>Delichon urbicum</i>                | WA                          | Amber                                               | NBDC online database record | Within 2km NE (O07Y)                                | 31/12/2011          |
| House Sparrow<br><i>Passer domesticus</i>              | WA                          | Amber                                               | NBDC online database record | Within 2km NE (O07Y)                                | 28/06/2019          |
| Little Egret<br><i>Egretta garzetta</i>                | WA, BD_I                    | Green                                               | NBDC online database record | Within 2km SW (O07S)                                | 16/03/2023          |
| Little Grebe<br><i>Tachybaptus ruficollis</i>          | SCI_WA                      | Green                                               | NBDC online database record | Within 2km SW (O07S)                                | 22/06/2022          |
| Mallard<br><i>Anas</i>                                 | SCI_WA, BD_II (I), III      | Amber                                               | NBDC online database record | Within 2km SW (O07S)                                | 03/03/2023          |

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| Common Name<br><i>Scientific Name</i>          | Legal Status                | Species Red List Status or BoCCI status (for Birds) | Source                      | Location in Relation to Mell Quarry (NBDC Grid Ref) | Date of Last Record |
|------------------------------------------------|-----------------------------|-----------------------------------------------------|-----------------------------|-----------------------------------------------------|---------------------|
| <i>platyrhynchos</i>                           | (I)                         |                                                     |                             |                                                     |                     |
| Mew Gull<br><i>Larus canus</i>                 | SCI_WA                      | Amber                                               | NBDC online database record | Within 2km SW (O07S)                                | 13/11/2016          |
| Mute Swan<br><i>Cygnus olor</i>                | WA                          | Amber                                               | NBDC online database record | Within 2km SW (O07S)                                | 16/03/2023          |
| Northern Lapwing<br><i>Vanellus vanellus</i>   | SCI_WA, BD_II (II)          | Red                                                 | NBDC online database record | Within 2km NE (O07Y)                                | 31/12/2011          |
| Peregrine Falcon<br><i>Falco peregrinus</i>    | SCI_WA, BD_I                | Green                                               | NBDC online database record | Within 2km NW (O07T)                                | 31/12/2011          |
| Redwing<br><i>Turdus iliacus</i>               | WA                          | Red                                                 | NBDC online database record | Within 2km NW (O07T)                                | 31/12/2011          |
| Rock Pigeon<br><i>Columba livia</i>            | WA, BD_II (I)               | Green                                               | NBDC online database record | Within 2km SE (O07X)                                | 11/07/2019          |
| Sky Lark<br><i>Alauda arvensis</i>             | WA                          | Amber                                               | NBDC online database record | Within 2km NW (O07T)                                | 31/12/2011          |
| Spotted Flycatcher<br><i>Muscicapa striata</i> | WA                          | Amber                                               | NBDC online database record | Within 2km NW (O07T)                                | 31/07/1991          |
| Stock Pigeon<br><i>Columba oenas</i>           | WA                          | Red                                                 | NBDC online database record | Within 2km NW (O07T)                                | 31/12/2011          |
| Tufted Duck<br><i>Aythya fuligula</i>          | SCI_WA, BD_II (I), III (II) | Amber                                               | NBDC online database record | Within 2km NW (O07T)                                | 16/03/2023          |
| Yellowhammer<br><i>Emberiza citrinella</i>     | WA                          | Red                                                 | NBDC online database record | Within 2km NW (O07T)                                | 07/06/2019          |
| <b>Mammal</b>                                  |                             |                                                     |                             |                                                     |                     |
| Daubenton's Bat<br><i>Myotis daubentonii</i>   | HD_WA_IV                    |                                                     | NBDC online database record | Within 2km SE (O07X)                                | 26/08/2020          |
| Eurasian Badger<br><i>Meles meles</i>          | WA                          |                                                     | NBDC online database record | Within 2km NW (O07T)                                | 08/03/2023          |
| European Otter<br><i>Lutra lutra</i>           | HD_WA_II_I V                |                                                     | NBDC online database record | Within 2km SE (O07X)                                | 14/01/2018          |
| Irish Hare<br><i>Lepus timidus</i> subsp.      | WA_HD_V                     |                                                     | NBDC online database record | Within 2km NW (O07T)                                | 08/02/2015          |

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| Common Name<br>Scientific Name                         | Legal Status | Species Red List Status or BoCCI status (for Birds) | Source                      | Location in Relation to Mell Quarry (NBDC Grid Ref) | Date of Last Record |
|--------------------------------------------------------|--------------|-----------------------------------------------------|-----------------------------|-----------------------------------------------------|---------------------|
| <i>hibernicus</i>                                      |              |                                                     |                             |                                                     |                     |
| Lesser Noctule<br><i>Nyctalus leisleri</i>             | HD_WA_IV     |                                                     | NBDC online database record | Within 2km SE (O07X)                                | 21/08/2009          |
| Pine Marten<br><i>Martes martes</i>                    | HD_WA_V      |                                                     | NBDC online database record | Within 2km SE (O07X)                                | 02/12/2020          |
| Red Fox<br><i>Vulpes vulpes</i>                        | N/A          |                                                     | NBDC online database record | Within 2km SE (O07X)                                | 01/09/2015          |
| Soprano Pipistrelle<br><i>Pipistrellus pygmaeus</i>    | HD_WA_IV     |                                                     | NBDC online database record | Within 2km SE (O07X)                                | 01/08/2010          |
| West European Hedgehog<br><i>Erinaceus europaeus</i>   | WA           |                                                     | NBDC online database record | Within 2km NE (O07Y)                                | 06/09/2022          |
| <b>Mollusc</b>                                         |              |                                                     |                             |                                                     |                     |
| Common Whorl Snail<br><i>Vertigo (Vertigo) pygmaea</i> |              |                                                     | NBDC online database record | Within 2km SW (O07S)                                | 14/09/1998          |
| <i>Sphaerium nucleus</i>                               |              |                                                     | NBDC online database record | Within 2km SW (O07S)                                | 08/10/2008          |
| <b>Reptile</b>                                         |              |                                                     |                             |                                                     |                     |
| Common Lizard<br><i>Zootoca vivipara</i>               | WA           |                                                     | NBDC online database record | Within 2km SE (O07X)                                | 11/09/1976          |

Desktop records of invasive plant species which are scheduled under articles 49 and 50 of the Birds and Habitats Regulations are considered as a potential threat in respect of biodiversity. S.I.477 species within the vicinity of the Proposed Development are listed in Table A.5 below

**Table A.5:** Non-Native invasive species listed under S.I 477 of the Birds and Habitats Directive

| Common Name<br>Scientific Name                   | Legal Status                                          | Source                      | Date of Last Record |
|--------------------------------------------------|-------------------------------------------------------|-----------------------------|---------------------|
| <b>Flora</b>                                     |                                                       |                             |                     |
| Giant Hogweed<br><i>Heracleum mantegazzianum</i> | Third schedule of S.I. 477 / Species of Union concern | NBDC online database record | 18/07/2005          |
| Rhododendron<br><i>Rhododendron ponticum</i>     | Third schedule of S.I. 477 / Species of Union concern | NBDC online database record | 18/07/2005          |
| Sea-buckthorn<br><i>Hippophae rhamnoides</i>     | Third schedule of S.I. 477 / Species of Union concern | NBDC online database record | 21/10/2013          |

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| Common Name<br>Scientific Name            | Legal Status                                          | Source                      | Date of Last Record |
|-------------------------------------------|-------------------------------------------------------|-----------------------------|---------------------|
|                                           | concern                                               |                             |                     |
| Common Cord-Grass <i>Spartina anglica</i> | Third schedule of S.I. 477 / Species of Union concern | NBDC online database record | 11/07/2014          |



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## Examples of Valuing Important Ecological Features

**Table A.6:** Examples of Valuing Important Ecological Features

| International Importance:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.</li> <li>• Proposed Special Protection Area (pSPA).</li> <li>• Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).</li> <li>• Features essential to maintaining the coherence of the Natura 2000 Network.<sup>181</sup></li> <li>• Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.</li> <li>• Resident or regularly occurring populations (assessed to be important at the national level)<sup>182</sup> of the following: <ul style="list-style-type: none"> <li>– Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or</li> <li>– Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.</li> </ul> </li> <li>• Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).</li> <li>• World Heritage Site (Convention for the Protection of World Cultural &amp; Natural Heritage, 1972).</li> <li>• Biosphere Reserve (UNESCO Man &amp; The Biosphere Programme).</li> <li>• Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).</li> <li>• Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).</li> <li>• Biogenetic Reserve under the Council of Europe.</li> <li>• European Diploma Site under the Council of Europe.</li> <li>• Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 1988).<sup>183</sup></li> </ul> |
| National Importance:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• Site designated or proposed as a Natural Heritage Area (NHA).</li> <li>• Statutory Nature Reserve.</li> <li>• Refuge for Fauna and Flora protected under the Wildlife Acts.</li> <li>• National Park.</li> <li>• Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.</li> <li>• Resident or regularly occurring populations (assessed to be important at the national level)<sup>184</sup> of the</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

<sup>181</sup> See Articles 3 and 10 of the Habitats Directive

<sup>182</sup> It is suggested that, in general, 1% of the national population of such species qualifies as an internationally important population. However, a smaller population may qualify as internationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

<sup>183</sup> Note that such waters are designated based on these waters' capabilities of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*)

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>following:</p> <ul style="list-style-type: none"> <li>– Species protected under the Wildlife Acts; and/or</li> <li>– Species listed on the relevant Red Data list.</li> <li>• Site containing 'viable areas'<sup>185</sup> of the habitat types listed in Annex I of the Habitats Directive</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <p><b>County Importance:</b></p> <ul style="list-style-type: none"> <li>• Area of Special Amenity.<sup>186</sup></li> <li>• Area subject to a Tree Preservation Order.</li> <li>• Area of High Amenity, or equivalent, designated under the County Development Plan.</li> <li>• Resident or regularly occurring populations (assessed to be important at the County level)<sup>187</sup> of</li> <li>• the following: <ul style="list-style-type: none"> <li>– Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;</li> <li>– Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;</li> <li>– Species protected under the Wildlife Acts; and/or</li> <li>– Species listed on the relevant Red Data list.</li> </ul> </li> <li>• Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.</li> <li>• County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local Biodiversity Action Plan, if this has been prepared.</li> <li>• Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.</li> <li>• Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.</li> </ul> |
| <p><b>Local Importance (higher value):</b></p> <ul style="list-style-type: none"> <li>• Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;</li> <li>• Resident or regularly occurring populations (assessed to be important at the Local level)<sup>188</sup> of the following: <ul style="list-style-type: none"> <li>– Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;</li> <li>– Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

<sup>184</sup> It is suggested that, in general, 1% of the national population of such species qualifies as a nationally important population. However, a smaller population may qualify as nationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

<sup>185</sup> A 'viable area' is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change (for example, as a result of climatic variation).

<sup>186</sup> It should be noted that whilst areas such as Areas of Special Amenity, areas subject to a Tree Preservation Order and Areas of High Amenity are often designated on the basis of their ecological value, they may also be designated for other reasons, such as their amenity or recreational value. Therefore, it should not be automatically assumed that such sites are of County importance from an ecological perspective.

<sup>187</sup> It is suggested that, in general, 1% of the County population of such species qualifies as a County important population. However, a smaller population may qualify as County important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

<sup>188</sup> It is suggested that, in general, 1% of the local population of such species qualifies as a locally important population. However, a smaller population may qualify as locally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

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- Species protected under the Wildlife Acts; and/or
- Species listed on the relevant Red Data list.
- Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
- Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

**Local Importance (lower value):**

- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;
- Sites or features containing non-native species that are of some importance in maintaining habitat links.

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## Wintering Bird Survey Results

**Table A.7:** Species identified during the wintering bird surveys across the main site and three auxiliary sites

| Species                                                | BoCCI | Annex I | Status                   | SCI | Location Description           |
|--------------------------------------------------------|-------|---------|--------------------------|-----|--------------------------------|
| Snipe <i>Gallinago gallinago</i>                       | Red   | No      | WA, BD_II (I), III (III) | No  | Baltray satellite              |
| Red-breasted merganser <i>Mergus serrator</i>          | Amber | No      | WA, BD_II (II)           | Yes | Baltray satellite              |
| Little grebe <i>Tachybaptus ruficollis</i>             | Amber | No      | WA                       | Yes | Baltray satellite              |
| Peregrine <i>Falco peregrinus</i>                      | Green | Yes     | WA, BD_I                 | Yes | Throughout                     |
| Buzzard <i>Buteo buteo</i>                             | Green | No      | WA                       | No  | Throughout                     |
| Mallard <i>Anas platyrhynchos</i>                      | Amber | No      | WA, BD_II (I), III (I)   | Yes | Throughout                     |
| Redwing <i>Turdus iliacus</i>                          | Red   | No      | WA                       | No  | Throughout                     |
| Fieldfare <i>Turdus pilaris</i>                        | Green | No      | WA                       | No  | Main site                      |
| Shelduck <i>Tadorna tadorna</i>                        | Amber | No      | WA                       | Yes | Estuary and surrounding fields |
| Black-headed gull <i>Chroicocephalus ridibundus</i>    | Amber | No      | WA                       | Yes | Estuary and surrounding fields |
| Herring gull <i>Larus argentatus</i>                   | Amber | No      | WA                       | Yes | Throughout                     |
| Little egret <i>Egretta garzetta</i>                   | Green | Yes     | WA, BD_I                 | No  | Estuary                        |
| Lapwing <i>Vanellus vanellus</i>                       | Red   | No      | WA, BD_II (II)           | Yes | Estuary and surrounding fields |
| Redshank <i>Tringa totanus</i>                         | Red   | No      | WA                       | Yes | Estuary                        |
| Grey heron <i>Ardea cinerea</i>                        | Green | No      | WA                       | Yes | Throughout                     |
| Common gull <i>Larus canus</i>                         | Amber | No      | WA                       | Yes | Estuary and surrounding fields |
| Kestrel <i>Falco tinnunculus</i>                       | Red   | No      | WA                       | No  | Quarry site                    |
| Curlew <i>Numenius arquata</i>                         | Red   | No      | WA, BD_II (II)           | Yes | Estuary                        |
| Black-tailed godwit <i>Limosa limosa</i>               | Red   | No      | WA                       | Yes | Estuary                        |
| Cormorant <i>Phalacrocorax carbo</i>                   | Amber | No      | WA                       | Yes | Throughout                     |
| Light-bellied Brent geese <i>Branta bernicla hrota</i> | Amber | No      | WA                       | Yes | Estuary                        |
| Greenshank <i>Tringa nebularia</i>                     | Green | No      | WA                       | Yes | Estuary                        |
| Great black-backed gull <i>Larus marinus</i>           | Green | No      | WA                       | No  | Estuary                        |
| Teal <i>Anas crecca</i>                                | Amber | No      | WA, BD_II (I) III (II)   | Yes | Estuary and Baltray site       |
| Wigeon <i>Mareca penelope</i>                          | Amber | No      | WA, BD_II (I), III (II)  | Yes | Estuary and Baltray site       |
| Oystercatcher <i>Haematopus ostralegus</i>             | Red   | No      | WA                       | Yes | Estuary and Baltray site       |
| Mute swan <i>Cygnus olor</i>                           | Amber | No      | WA                       | No  | Estuary and Boyne site         |
| Moorhen <i>Gallinula chloropus</i>                     | Green | No      | WA                       | No  | Quarry site                    |
| Greenshank <i>Tringa nebularia</i>                     | Green | No      | WA                       | Yes | Estuary and Boyne site         |

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## Breeding Bird Survey Results

**Table A.8:** Species identified during the Breeding bird surveys (carried out by Altermar) across the main site and three auxiliary sites

| Species                                  | BoCCI | Annex I | Status                 | SCI | Location Description           |
|------------------------------------------|-------|---------|------------------------|-----|--------------------------------|
| Blackbird <i>Turdus merula</i>           | Green | No      | WA                     | No  | Boyne (Littlegrange Site)      |
| Blackbird <i>Turdus merula</i>           | Green | No      | WA                     | No  | Factory (Proposed Development) |
| Blackcap <i>Sylvia atricapilla</i>       | Green | No      | WA                     | No  | Boyne (Littlegrange Site)      |
| Blackcap <i>Sylvia atricapilla</i>       | Green | No      | WA                     | No  | Factory (Proposed Development) |
| Blue Tit <i>Cyanistes caeruleus</i>      | Green | No      | WA                     | No  | Factory (Proposed Development) |
| Chaffinch <i>Fringilla coelebs</i>       | Green | No      | WA                     | No  | Factory (Proposed Development) |
| Chaffinch <i>Fringilla coelebs</i>       | Green | No      | WA                     | No  | Mell (Mell Quarry Site)        |
| Chiffchaff <i>Phylloscopus collybita</i> | Green | No      | WA                     | No  | Factory (Proposed Development) |
| Chiffchaff <i>Phylloscopus collybita</i> | Green | No      | WA                     | No  | Mell (Mell Quarry Site)        |
| Dunnock <i>Prunella modularis</i>        | Green | No      | WA                     | No  | Factory (Proposed Development) |
| Goldcrest <i>Regulus regulus</i>         | Amber | No      | WA                     | No  | Factory (Proposed Development) |
| Goldcrest <i>Regulus regulus</i>         | Amber | No      | WA                     | No  | Mell (Mell Quarry Site)        |
| Goldfinch <i>Carduelis carduelis</i>     | Green | No      | WA                     | No  | Factory (Proposed Development) |
| Goldfinch <i>Carduelis carduelis</i>     | Green | No      | WA                     | No  | Mell (Mell Quarry Site)        |
| Jackdaw <i>Corvus monedula</i>           | Green | No      | WA                     | No  | Mell (Mell Quarry Site)        |
| Linnet <i>Linaria cannabina</i>          | Amber | No      | WA                     | No  | Factory (Proposed Development) |
| Mallard <i>Anas platyrhynchos</i>        | Amber | Yes     | WA, BD_II (I), III (I) | Yes | Boyne (Littlegrange Site)      |
| Mistle Thrush <i>Turdus viscivorus</i>   | Green | No      | WA                     | No  | Factory (Proposed Development) |
| Moorhen <i>Gallinula chloropus</i>       | Green | No      | WA                     | No  | Mell (Mell Quarry Site)        |
| Peregrine Falcon <i>Falco peregrinus</i> | Green | Yes     | WA, BD_I               | Yes | Mell (Mell Quarry Site)        |
| Robin <i>Erithacus rubecula</i>          | Green | No      | WA                     | No  | Boyne (Littlegrange Site)      |



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| Species                                            | BoCCI | Annex I | Status                 | SCI | Location Description           |
|----------------------------------------------------|-------|---------|------------------------|-----|--------------------------------|
| Robin<br><i>Erithacus rubecula</i>                 | Green | No      | WA                     | No  | Factory (Proposed Development) |
| Rook<br><i>Corvus frugilegus</i>                   | Green | No      | WA                     | No  | Factory (Proposed Development) |
| Rook<br><i>Corvus frugilegus</i>                   | Green | No      | WA                     | No  | Mell (Mell Quarry Site)        |
| Sedge Warbler<br><i>Acrocephalus schoenobaenus</i> | Green | No      | WA                     | No  | Boyne (Littlegrange Site)      |
| Song Thrush<br><i>Turdus philomelos</i>            | Green | No      | WA                     | No  | Boyne (Littlegrange Site)      |
| Song Thrush<br><i>Turdus philomelos</i>            | Green | No      | WA                     | No  | Factory (Proposed Development) |
| Song Thrush<br><i>Turdus philomelos</i>            | Green | No      | WA                     | No  | Mell (Mell Quarry Site)        |
| Starling<br><i>Sturnus vulgaris</i>                | Amber | No      | WA                     | No  | Factory (Proposed Development) |
| Swallow<br><i>Hirundo rustica</i>                  | Amber | No      | WA                     | No  | Factory (Proposed Development) |
| Willow Warbler<br><i>Phylloscopus trochilus</i>    | Amber | No      | WA                     | No  | Boyne (Littlegrange Site)      |
| Willow Warbler<br><i>Phylloscopus trochilus</i>    | Amber | No      | WA                     | No  | Factory (Proposed Development) |
| Wood Pigeon<br><i>Columba palumbus</i>             | Green | Yes     | WA, BD_II (I), III (I) | No  | Factory (Proposed Development) |
| Wood Pigeon<br><i>Columba palumbus</i>             | Green | Yes     | WA, BD_II (I), III (I) | No  | Mell (Mell Quarry Site)        |
| Wren<br><i>Troglodytes troglodytes</i>             | Green | No      | WA                     | No  | Boyne (Littlegrange Site)      |
| Wren<br><i>Troglodytes troglodytes</i>             | Green | No      | WA                     | No  | Factory (Proposed Development) |
| Wren<br><i>Troglodytes troglodytes</i>             | Green | No      | WA                     | No  | Mell (Mell Quarry Site)        |
| Yellowhammer<br><i>Emberiza citrinella</i>         | Red   | No      | WA                     | No  | Factory (Proposed Development) |

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## Appendix B

### Air Dispersion Modelling Contour Plots

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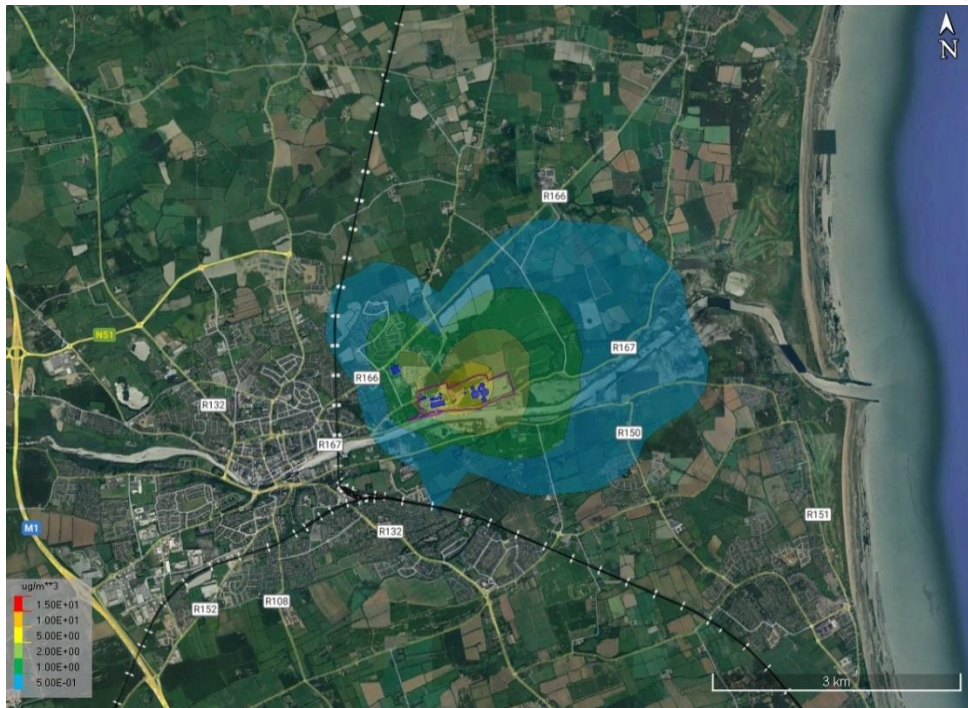


**Figure B.1:** Site only Annual Average Ground Level Concentrations for NO<sub>x</sub>/NO<sub>2</sub> (2017 Met Year)

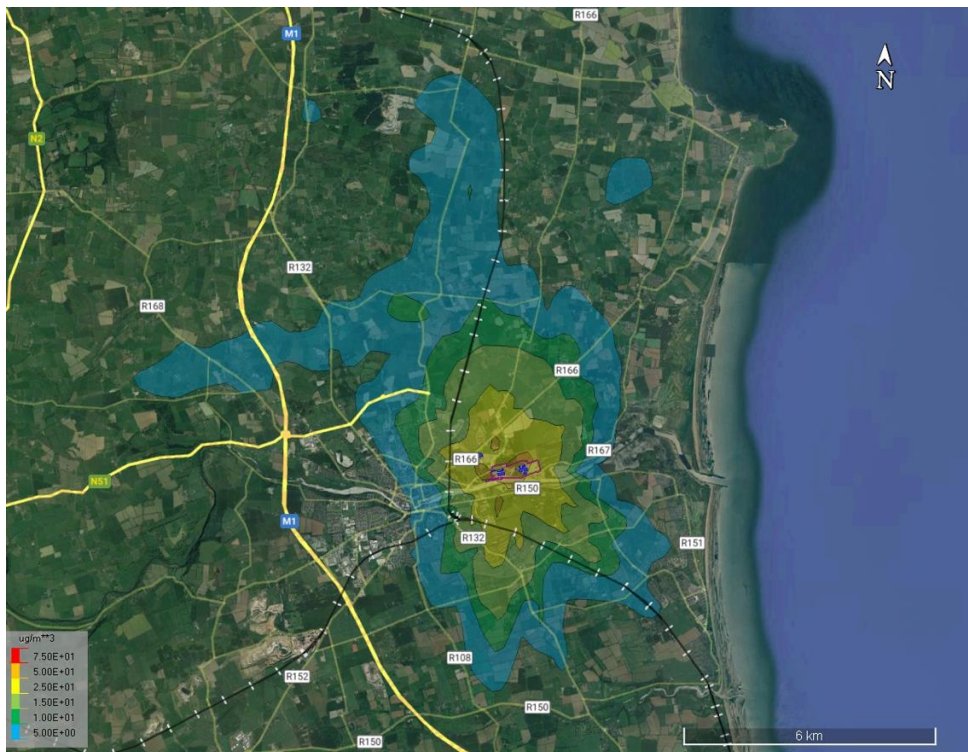


**Figure B.2:** Site only 99.8%ile Hourly Average Ground Level Concentrations for NO<sub>2</sub> (2021 Met Year)



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**Figure B.3:** Site only 8-Hour Average Ground Level Concentrations for CO (2019 Met Year)

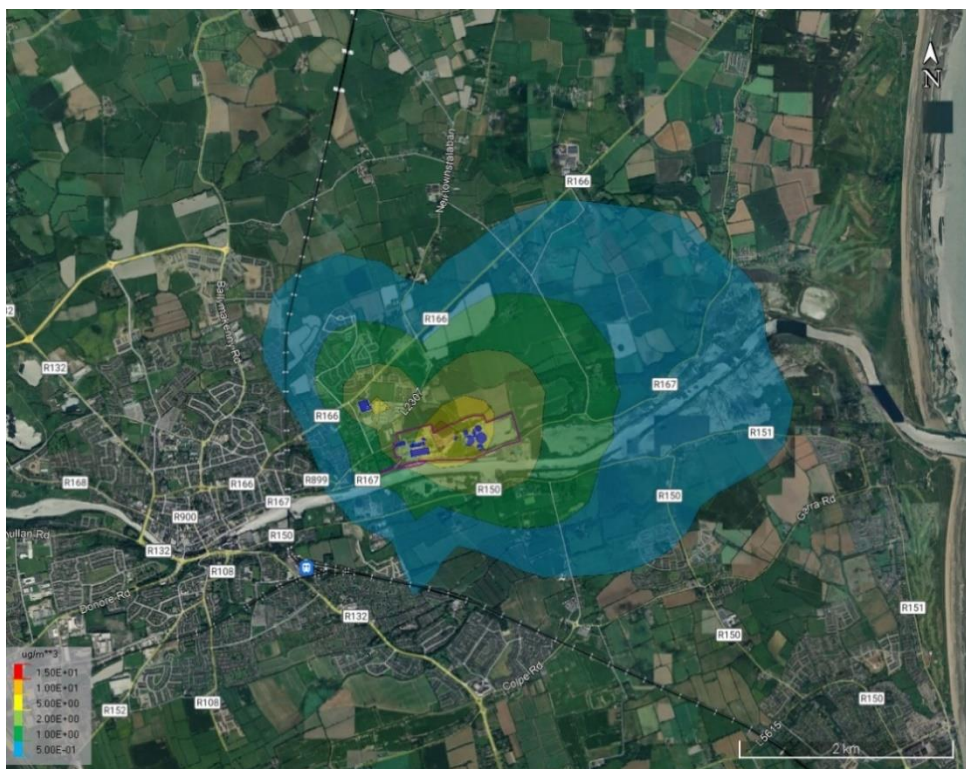


**Figure B.4:** Cumulative Annual Average Ground Level Concentrations for NO<sub>x</sub>/NO<sub>2</sub> (2017 Met Year)



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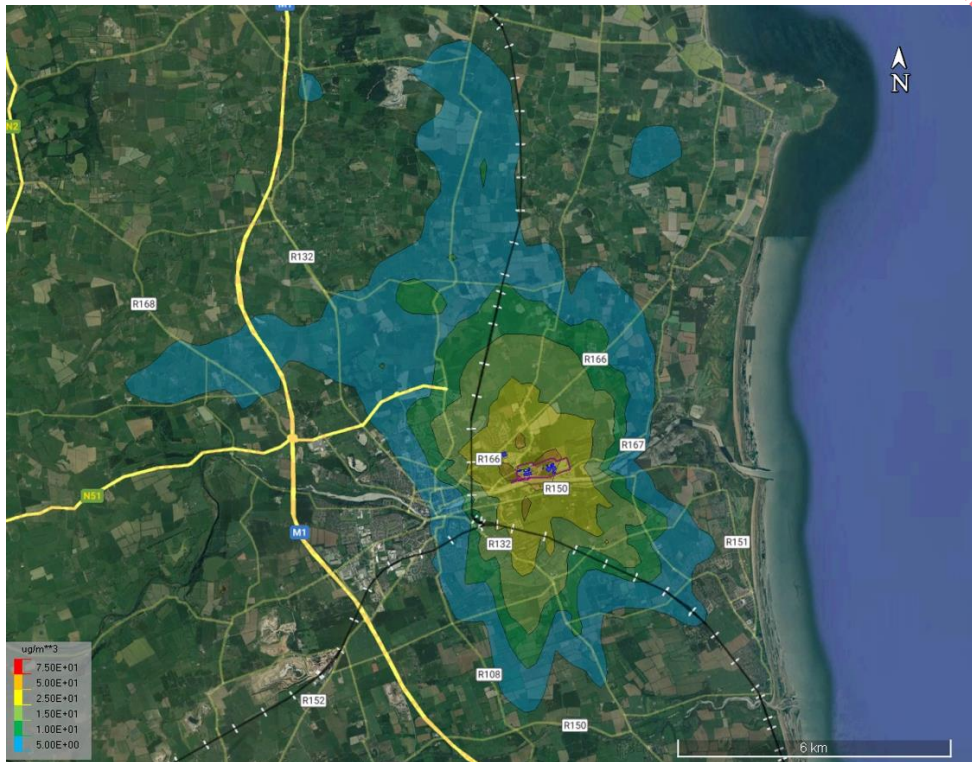


**Figure B.5:** Cumulative 99.8%ile Hourly Average Ground Level Concentrations for NO<sub>2</sub> (2021 Met Year)



**Figure B.6:** Cumulative 8-Hour Average Ground Level Concentrations for CO (2019 Met Year)



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## Appendix C

### Climate Change Resilience Risk Assessment

Potential climate change impact hazards, likelihood of occurrence and potential consequence of each impact is assessed using the risk framework provided in the *TII Climate Guidance for National Roads, Light Rail, and Rural Cycleways (2022)* which is based on the framework detailed in the *European Union Technical Guidance on climate proofing (2021)*.

Table C.1: Assessment of Likelihood

| Likelihood (L) Categories | Qualitative               | Quantative |
|---------------------------|---------------------------|------------|
| 1 Rare                    | Highly unlikely to occur  | 5%         |
| 2 Unlikely                | Unlikely to occur         | 20%        |
| 3 Moderate                | As likely to occur as not | 50%        |
| 4 Likely                  | Likely to occur           | 80%        |
| 5 Almost Certain          | Very likely to occur      | 95%        |

Table C.2: Assessment of Consequence

| Risk Areas                             | Magnitude of Consequence                                                                             |                                                                                          |                                                                                 |                                                                                                                                             |                                                                                                                  |
|----------------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
|                                        | 1 Insignificant                                                                                      | 2 Minor                                                                                  | 3 Moderate                                                                      | 4 Major                                                                                                                                     | 5 Catastrophic                                                                                                   |
| Asset damage, engineering, operational | Impact can be absorbed through normal activity.                                                      | Adverse event that can be absorbed by taking business continuity actions.                | A serious event that requires additional emergency business continuity actions. | A critical event that requires extraordinary / emergency business continuity action.                                                        | Disaster with the potential to lead to shut down or collapse or loss of the asset / network.                     |
| Health and Safety                      | First aid case.                                                                                      | Minor injury, medical Treatment.                                                         | Serious injury or lost work.                                                    | Major or multiple injuries, permanent injury or disability.                                                                                 | Single or multiple Fatalities.                                                                                   |
| Environmental                          | No impact on baseline environment.<br><br>Localised in the source area.<br><br>No recovery required. | Localised within site boundaries.<br><br>Recovery measurable within one month of impact. | Moderate harm with possible wider effect<br><br>Recovery in one Year.           | Significant harm with local effect<br><br>Recovery longer than one year.<br><br>Failure to comply with environmental regulations / consent. | Significant harm with widespread effect.<br><br>Recovery longer than one year. Limited prospect of full recovery |
| Financial                              | < 2% of turnover                                                                                     | 2-10% of turnover                                                                        | 10-25% of turnover                                                              | 25-50% of turnover                                                                                                                          | > 50% of turnover                                                                                                |

Table C.3: Impact Criteria to Establish Significance

| Likelihood       | Magnitude of Consequence |         |            |         |                |
|------------------|--------------------------|---------|------------|---------|----------------|
|                  | 1 Insignificant          | 2 Minor | 3 Moderate | 4 Major | 5 Catastrophic |
| 1 Rare           | Low                      | Low     | Medium     | High    | Extreme        |
| 2 Unlikely       | Low                      | Low     | Medium     | High    | Extreme        |
| 3 Moderate       | Low                      | Medium  | High       | Extreme | Extreme        |
| 4 Likely         | Medium                   | High    | High       | Extreme | Extreme        |
| 5 Almost Certain | High                     | High    | Extreme    | Extreme | Extreme        |

Table C.4: Risk Assessment and Mitigation Measures

| Risk ID No. | Climate Hazard                                                                   | Risk Narrative<br><br><i>Description of climate change impact risks associated with climate hazard and indication of likelihood</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Consequences<br><br><i>All possible consequences associated with the risk of the climate hazard on buildings/spaces/infrastructure /services/biodiversity/operational workers</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Gross Risk |   |        | Proposed Adaptation/ Mitigation Measures<br><br><i>Description of controls in place to mitigate climate variable risk.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Net Risk |   |     |
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|             |                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | L          | M | R      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | L        | S | R   |
| 1.          | Extreme Heat / Increasing Temperature s including increase in Annual Temperature | <b>Building Overheating</b><br>Building overheating contributes to: <ul style="list-style-type: none"><li>Poor indoor air quality</li><li>Decreased relative humidity</li><li>Increased energy demand for cooling</li></ul> <b>Urban heat island effect</b><br>Urban heat islands contribute to: <ul style="list-style-type: none"><li>Higher daytime temperatures</li><li>Increased summertime peak energy demand</li><li>Reduced night-time cooling</li><li>Higher air-pollution levels</li><li>Increased GHG emissions</li><li>Loss of biodiversity<ul style="list-style-type: none"><li>By the middle of this century (2041 – 2060) the average annual temperatures in Ireland are projected to increase by between 1–1.2°C and 1.3–1.6°C depending on the emissions trajectory<sup>189</sup>. The number of warm days is expected to increase and heat waves are expected to occur more frequently.</li></ul></li></ul> | <ul style="list-style-type: none"><li>Negative effect on the thermal comfort of occupants, leading to poor quality of work/output.</li><li>Poor indoor air quality due to humidity levels (&lt;25% feels uncomfortably dry), leading to poor quality of work/output.</li><li>Increased energy costs due to increased cooling demand.</li><li>Increased air intake temperatures leading to operations running out of temperature specification if equipment has not sufficient capacity.</li><li>Heat-related illnesses such as general discomfort, respiratory difficulties, heat cramps, heat exhaustion, and non-fatal heat stroke.</li><li>Destruction of habitats.</li><li>Reduction in CO<sub>2</sub> sinks due to the destruction of habitats (trees/hedges/planting).</li><li>Temperature rises are also likely to influence the behaviour and lifecycles of animal and plant species. This could in turn lead to increased numbers of pests and invasive species, and a higher incidence of certain human diseases.</li></ul> | 3          | 2 | Medium | The following design measures are proposed to mitigate the risk of buildings included in the Proposed Development overheating: <ul style="list-style-type: none"><li>Provision of appropriate ventilation</li><li>DC design has few external windows.</li><li>In the office zones where natural daylighting is beneficial, PV cells/ panels also act as sun shading devices on the DC roof and southern façade, EC Roof and on grade at capped Stockpile 3 and the Landfill.</li><li>Bio-Solar façade on DC will lead to decreased surface temperature due to evapotranspiration,</li><li>Weather analysis used to inform façade design with integrated PVs</li><li>Office portion of DC is fully glazed façade with Brise Soleil (an architectural feature of a building that reduces heat gain within that building by deflecting sunlight)</li><li>Selecting materials with high surface reflectance index (SRI) values for the BESS and Thermal Storage compounds (concrete), Substation Compound (mix concrete and hardcore), area between DC and Utility Yard (concrete).</li><li>Where relevant, use of materials that won't fade or warp in high heat</li><li>Proposed external soft landscape planting, including trees is likely to have local microclimate benefits in external spaces by providing cooling in paved spaces occupied by and adjacent to buildings.</li><li>The increase in green (soft) surface cover of the site (over the existing baseline industrial development) in reducing the local heat island effect.</li><li>The proposed Landscape Plan includes a broad range of plant species which have been selected to ensure resilience to the potential effects of climate change including changes/extremes of weather including rainfall, pests and diseases.</li></ul> | 2        | 2 | Low |

<sup>189</sup> Met Éireann (2020) "New Climate Projections 2020", <https://www.met.ie/epa-climate-projections-2020>, accessed 20 February 2023

| Risk ID No. | Climate Hazard                   | Risk Narrative<br><br><i>Description of climate change impact risks associated with climate hazard and indication of likelihood</i>                                                                                                                      | Consequences<br><br><i>All possible consequences associated with the risk of the climate hazard on buildings/spaces/infrastructure /services/biodiversity/operational workers</i> | Gross Risk                                                              |   |     | Proposed Adaptation/ Mitigation Measures<br><br><i>Description of controls in place to mitigate climate variable risk</i>                                                                                                                                                                                                                                                                                                                                                    | Net Risk                                                                |   |     |
|-------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|---|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|---|-----|
|             |                                  |                                                                                                                                                                                                                                                          |                                                                                                                                                                                   | <i>Refer to Likelihood and Severity Categories and Risk Matrix</i><br>L | M | R   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <i>Refer to Likelihood and Severity Categories and Risk Matrix</i><br>L | S | R   |
| 2.          | Extreme Cold / Low Temperature s | <b>Lower Temperatures</b><br><br>Lower temperatures (< 0°C) could results in snow / ice at the site.<br><br><u>Likelihood</u><br><br>It is expected that the number of frost and ice days will decrease by approximately 50% by mid-century (2041-2060). | Low temperatures < 0°C may result in snow and/or ice that disrupts access to site for critical personnel or critical supplies.<br>Potential for ice slips and falls.              | 2                                                                       | 2 | Low | The gross risk of extreme cold / low temperature conditions is considered low for the Proposed Development therefore additional mitigation measures are not deemed necessary. Buildings included in the Proposed Development have been designed with a high thermal performance of building envelope.<br>During extreme cold / low temperature conditions at the site, the onsite pathways will be cleared/salted and external routes to site via main roads will be salted. | 2                                                                       | 2 | Low |

| Risk ID No. | Climate Hazard                                                                                                                                                      | Risk Narrative<br><br><i>Description of climate change impact risks associated with climate hazard and indication of likelihood</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Consequences<br><br><i>All possible consequences associated with the risk of the climate hazard on buildings/spaces/infrastructure /services/biodiversity/operational workers</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Gross Risk |   |     | Proposed Adaptation/ Mitigation Measures<br><br><i>Description of controls in place to mitigate climate variable risk</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Net Risk |   |     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---|-----|
|             |                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | L          | M | R   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | L        | S | R   |
| 3.          | Flooding / Increases in Rainfall<br>Coastal flooding including sea level rise and storm surge<br>Fluvial/River flooding<br>Groundwater flooding<br>Pluvial flooding | <b>Flooding</b><br>Increased rainfall contributes to:<br><ul style="list-style-type: none"> <li>Coastal flooding</li> <li>Fluvial flooding</li> <li>Pluvial (surface water) flooding</li> <li>Groundwater flooding</li> <li>Sewer flooding</li> <li>Flash flooding</li> </ul> <b>Likelihood</b><br>For Ireland Mid-century (2041-2060) predictions for precipitation in Ireland state that it is expected to become more variable, with substantial projected increases in the occurrence of both dry periods and heavy precipitation events. Projections indicate a substantial increase in the frequency of heavy precipitation events in Winter and Autumn (approx. 20%) <sup>190</sup> .<br>In addition, the frequency and size of flooding is expected to increase with new areas not already subject to flooding being affected <sup>191</sup> .<br>Neither the LCDP 2021-2027 Strategic Flood Risk Assessment or the Office of Public Works(OPW) Flood Risk Maps identify the site as having any flood risk issues. A Stage 1 Flood Risk Assessment has been completed by AtkinsRéalis for the subject site which confirmed the site is not at risk of flooding currently or in future. The site is considered to be located within a Flood Zone C (where the probability of flood is low or negligible – less than 0.1% or 1 in 1000 year for both watercourse and coastal flooding). Residual risks from more extreme events have been considered and it is concluded that these will not affect the site. The River Boyne is approximately 35 m from the site and approx. 7 m lower than the site. | <b>Flooding</b><br>Rainwater may lay/flow over the ground instead of draining away from the site through normal drainage systems, which could result in:<br><ul style="list-style-type: none"> <li>Water in the underlying strata rises to the surface</li> <li>Damage to property</li> <li>Operational disruption</li> <li>Rainwater penetration to building</li> <li>Condensation/damp/mould</li> </ul> Increased rainfall and heavy rain events causes additional exposure to Plant related safety events due to:<br><ul style="list-style-type: none"> <li>Reduced visibility</li> <li>Icy or wet conditions</li> <li>Local flooding</li> <li>Pollutant load from washing operational areas</li> <li>Accidental release of pollution from storage facilities or separators</li> <li>Restriction of essential supplies to the plant.</li> <li>Transport routes for key supplies disrupted.</li> </ul> - | 2          | 2 | Low | The gross risk of flooding conditions are considered low for the Proposed Development therefore additional flood resistant and flood resilient design measures are not deemed necessary. However the implementation of the below measures will further reduce the risk of flooding at the site. The Proposed Development includes a combination of nature based solutions with SUDs strategies including:<br><ul style="list-style-type: none"> <li>Green roof areas,</li> <li>Biofiltration planting,</li> <li>Tree Pits,</li> <li>Primary areas of swales included to the south of the DC,</li> <li>Permeable paving,</li> <li>Vortex stormwater discharge flow control</li> <li>Underground modular attenuation structure</li> </ul> A hybrid approach has been developed to include reuse of existing drainage systems, combined with the proposed new green/blue infrastructure. | 1        | 2 | Low |



| Risk ID No. | Climate Hazard                  | Risk Narrative<br><br>Description of climate change impact risks associated with climate hazard and indication of likelihood                                                                                                                                                                                                                                                 | Consequences<br><br>All possible consequences associated with the risk of the climate hazard on buildings/spaces/infrastructure /services/biodiversity/operational workers                                                                                                                       | Gross Risk |   |        | Proposed Adaptation/ Mitigation Measures<br><br>Description of controls in place to mitigate climate variable risk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Net Risk |   |     |
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|             |                                 |                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                  | L          | M | R      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | L        | S | R   |
| 4.          | Decreases in Rainfall / Drought | <b>Drought</b><br><br>Drought can lead to reduced water availability.<br><br><u>Likelihood</u><br><br>Climate projections for Ireland indicate that water resources will become depleted both in terms of water supply and quality and this is against a background of increasing demand due to, amongst others, increased irrigation requirements <sup>192</sup> .<br><br>- | <ul style="list-style-type: none"><li>- Environmental damage.</li><li>- Higher water rates.</li><li>- Reduced water availability.</li><li>- Extended periods of drought may lead to mandatory water reductions and limitations.</li><li>- Restrictions may be posed to water supplies.</li></ul> | 3          | 2 | Medium | The following mitigation measures have been proposed to reduce water usage required by the Proposed Development: <ul style="list-style-type: none"><li>- Use of dry cooling for most of the year and water-based evaporative cooling only during peak summer temperatures allows for a more efficient cooling system contributing to reduction in freshwater use;</li><li>- Existing freshwater abstraction point from Mel Quarry to be utilised for cooling water and firewater supply on site.</li><li>- The proposed Landscape Plan includes:<ul style="list-style-type: none"><li>- planting that does not require irrigation systems post establishment;</li><li>- species of plant species that are selected as part of bio-filtration beds as part of nature-based surface water management that are tolerant of drought as well as high rainfall events;</li><li>- a broad range of plant species selected to ensure resilience to the potential effects of climate change including changes/extremes of weather including rainfall and pests and diseases.</li></ul></li><li>- It is the intention to include water metering and low flow and flush fixtures and fittings during detailed design stages for the Proposed Development.</li></ul> | 2        | 2 | Low |

| Risk ID No. | Climate Hazard                                                                         | Risk Narrative<br><br>Description of climate change impact risks associated with climate hazard and indication of likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Consequences<br><br>All possible consequences associated with the risk of the climate hazard on buildings/spaces/infrastructure /services/biodiversity/operational workers                                                                                                                                                                                                           | Gross Risk |   |     | Proposed Adaptation/ Mitigation Measures<br><br>Description of controls in place to mitigate climate variable risk                                                                                   | Net Risk |   |     |
|-------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---|-----|
|             |                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                      | L          | M | R   |                                                                                                                                                                                                      | L        | S | R   |
| 5.          | Extreme Wind / Increase in Storm Intensity and Frequency including and Coastal Erosion | <p><b>Extreme Wind</b></p> <p>Extreme wind Can lead to:</p> <ul style="list-style-type: none"><li>- Pedestrian discomfort</li><li>- Pedestrian safety</li><li>- Risk of collapse/building damage in extreme storm conditions</li><li>- Destruction of habitat due to high winds blowing trees</li><li>- Risks to safety due to high winds damaging trees</li></ul> <p><u>Likelihood</u></p> <p>An overall reduction of ~10% in the numbers of storms affecting Ireland is predicted, with an eastward extension of the more severe wind storms over Ireland and the UK<sup>15</sup>.</p> <p>The Proposed Development site is not located at a coastal location (located approximately 4km from the Irish eastern coast.)</p> | <ul style="list-style-type: none"><li>- Wind speeds in excess of 10 m/s more than 5% of the time are unsuitable for all pedestrian activities.</li><li>- Mean wind speeds in excess of 20 m/s exceeded once per year (unsuitable for general public and able-bodied).</li><li>- Storms may cause prevention of access to site for critical personnel or critical supplies.</li></ul> | 2          | 2 | Low | The gross risk of extreme wind speed/storm conditions are considered low for the Proposed Development therefore specific mitigation measures are not required. There are five access routes to site. | 2        | 2 | Low |

| Risk ID No. | Climate Hazard      | Risk Narrative<br><br>Description of climate change impact risks associated with climate hazard and indication of likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Consequences<br><br>All possible consequences associated with the risk of the climate hazard on buildings/spaces/infrastructure /services/biodiversity/operational workers                                                                                                                                                                                                                                  | Gross Risk |   |     | Proposed Adaptation/ Mitigation Measures<br><br>Description of controls in place to mitigate climate variable risk                                                                                                       | Net Risk |   |     |
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|             |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                             | L          | M | R   |                                                                                                                                                                                                                          | L        | S | R   |
| 6.          | Sea Level Increases | <p><b>Tidal and Coastal Flooding</b></p> <p>Sea level increases may lead to more regular and significant Tidal and Coastal Flooding.</p> <p><u>Likelihood</u></p> <p>By the end of the 21st century, global mean sea level is expected to rise. With the increased warming of the ocean, the frequency of coastal storms is expected to increase and in combination, these changes are expected to exacerbate existing problems of coastal erosion and flooding<sup>193</sup>.</p> <p>The site is not at a coastal location (approx. 4km from the Irish eastern coast), however the River Boyne is under tidal influence at this location. As the site is 7m above the Boyne water levels, the risk of tidal flooding is considered very remote.</p> | <p><b>Tidal and Coastal Flooding</b></p> <ul style="list-style-type: none"><li>- Damage to property</li><li>- Damage to infrastructure</li><li>- Operational disruption</li><li>- Rainwater penetration to building</li><li>- Condensation/damp/mould</li><li>- Remote impacts could restrict the flow of essential supplies to the plant.</li><li>- Transport routes for key supplies disrupted.</li></ul> | 1          | 1 | Low | The gross risk of sea level increases and tidal and coastal flooding conditions are considered low for the Proposed Development, therefore specific mitigation in relation to tidal or coastal flooding is not required. | 1        | 1 | Low |

<sup>193</sup> Climate Ireland, <https://www.climateireland.ie/#!/tools/sectors/coastalAreas> , accessed 07 May 2024

| Risk ID No. | Climate Hazard    | Risk Narrative<br><br><i>Description of climate change impact risks associated with climate hazard and indication of likelihood</i>                                                                                                                                                                                                                                                                                                                                                                                                                                              | Consequences<br><br><i>All possible consequences associated with the risk of the climate hazard on buildings/spaces/infrastructure /services/biodiversity/operational workers</i> | Gross Risk |   |     | Proposed Adaptation/ Mitigation Measures<br><br><i>Description of controls in place to mitigate climate variable risk</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Net Risk |   |     |
|-------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---|-----|
|             |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                   | L          | M | R   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | L        | S | R   |
| 7.          | Biodiversity Loss | <p><b><u>Loss of habitats and extinction of species.</u></b></p> <p>A decline or disappearance of biological diversity can lead to loss of habitats and extinction of species.</p> <p><u>Likelihood</u></p> <p>Biodiversity loss is not a likely risk for the subject site of the Proposed Development is a brownfield site and does not currently hold a significant biodiversity value. Landscaping associated with the redevelopment of the site will likely improve biodiversity.</p> <p>Risk will be to the future redeveloped site with improved green infrastructure.</p> | <ul style="list-style-type: none"> <li>Potential negative impact on biodiversity at the subject site.</li> </ul>                                                                  | 1          | 1 | Low | <p>An Ecological Impact Assessment has been produced by Scott Cawley Limited for the Proposed Development and is included as <i>Chapter 8 Biodiversity</i> of this EIAR. This study identifies mitigation measures required for the Proposed Development to protect biodiversity. In addition, the following design measures have been incorporated in the Proposed Development to enhance biodiversity at the site.</p> <ul style="list-style-type: none"> <li>Bio-Solar façade on the DC will help to improve plant diversity &amp; resilience due to shading range.</li> <li>Development is designed with a focus on green and blue infrastructure connections with the wider landscape, prioritising habitat and existing trees retention and enhancement.</li> <li>Development is designed to support Biodiversity Net Gain target</li> <li>The Landscape Plan for the Proposed Development includes the following specific measures as part of a multi-functional landscape design response: <ul style="list-style-type: none"> <li>a landscape framework that will establish green infrastructure corridors along the northern and southern boundaries of the Proposed Development site that will connect to the wider established hedgerow and woodland network to the east of the site.</li> <li>a rich mix of seasonal herbaceous, perennial plant species and species rich grassland areas that support insects and pollinators in accordance with the All Ireland Pollinator Plan 2021-2025.</li> <li>a broad range of native tree species as part of new woodland clumps and corridors to support biodiversity and connectivity.</li> </ul> </li> </ul> | 1        | 1 | Low |

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## Appendix D

### Carbon Assessment Inputs



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**Table D.1:** Assumptions made for the EC Embodied Carbon model (provided by AtkinsRéalis)

| RICS Category                            | Material Element                                             | Assumption Made in Embodied Carbon Model                                             |
|------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 5.6 MEP                                  | Pressurisation units 4kW                                     | This was assumed as water pressure regulators                                        |
| 5.6 MEP                                  | Circulation Heat Rejection Pump 7.5 kW                       | This was assumed as an electric heat pump 14kW                                       |
| 5.6 MEP                                  | Quenching Circuit Pump 15kW and Tank Stratification Pump 4kW | Heat pumps 14kW                                                                      |
| 2.8 Internal Doors<br>2.6 External Doors | No specification given                                       | Assumed to be fire rated doors                                                       |
| 3.1 Wall Finishes                        | No specification given                                       | Layer of render covered by layers of paint                                           |
| 5.8 Electrical Services                  | Photovoltaic (PV) Panels on roof                             | Assumes 50% of roof area is covered with PV panels, equivalent to 948 m <sup>2</sup> |
| 2.5 External Walls                       | SFS framing for the metal louvre screen                      | Framing area assumed to be 15,229 kg for the external wall facades                   |
| 2.7 Internal Wall Finishes               | No specification given                                       | Assumed render for internal walls                                                    |

**Table D.2:** Assumptions made for the DC Embodied Carbon model (provided by AtkinsRéalis)

| RICS Category                            | Material Element                        | Assumption Made in Embodied Carbon Model                                             |
|------------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------------|
| 5.6 MEP                                  | CRAC Units for Data Hall cooling        | Replaced with Air Conditioning System                                                |
| 5.6 MEP                                  | Emergency Chiller 1850 kW               | Replaced with Chiller 500kW                                                          |
| 2.8 Internal Doors<br>2.6 External Doors | No specification given                  | Assumed to be fire rated doors                                                       |
| 3.1 Wall Finishes                        | No specification given                  | Layer of render covered by layers of paint                                           |
| 2.5 External Walls                       | SFS framing for the metal louvre screen | Framing area assumed to be 2,346 kg for the framing of metal louvres on the facades. |
| 2.7 Internal Wall Finishes               | No specification given                  | Assumed render for internal walls                                                    |
| 3.3 Ceiling Finishes                     | No specification given                  | Modular ceiling system                                                               |
| 5.8 Electrical Services                  | Photovoltaic (PV) Panels on roof        | Assumes 40% of roof area is covered with PV panels, equivalent to 660 m <sup>2</sup> |

**Table D.3:** List of Materials included in the EC Embodied Carbon model (provided by AtkinsRéalis)

| Building Element                                                                            | RICS Code | Material Name                           | Quantity | Unit  |
|---------------------------------------------------------------------------------------------|-----------|-----------------------------------------|----------|-------|
|                                                                                             | 1.1       | Substructure                            |          |       |
|                                                                                             | 1.1.1     | Foundations                             |          |       |
| Foundations                                                                                 | 1.1.1.1   | Steel Reinforcement (0% Recycled Steel) | 131622.0 | kg    |
| Foundations                                                                                 | 1.1.1.2   | Concrete                                | 1316.2   | m3    |
|                                                                                             | 2         | Superstructure                          |          |       |
|                                                                                             | 2.1       | Frame                                   |          |       |
| Beams                                                                                       | 2.1.4.1   | Concrete                                | 20.2     | m3    |
| Beams                                                                                       | 2.1.4.2   | Steel Reinforcement (0% Recycled Steel) | 1817.1   | kg    |
| Internal Walls                                                                              | 2.1.5.1   | Concrete                                | 2676.48  | m3    |
| Internal Walls                                                                              | 2.1.5.2   | Steel Reinforcement (0% Recycled Steel) | 267648.0 | kg    |
|                                                                                             | 2.2       | Upper floors                            |          |       |
| Floors                                                                                      | 2.2.1     | Concrete                                | 3415.2   | m3    |
| Floors                                                                                      | 2.2.2     | Steel Reinforcement (0% Recycled Steel) | 375672.0 | kg    |
|                                                                                             | 2.5       | External Walls                          |          |       |
|                                                                                             | 2.5.1     | Concrete                                | 481.7    | m3    |
|                                                                                             | 2.5.2     | Steel Reinforcement (0% Recycled Steel) | 48172.0  | kg    |
|                                                                                             | 2         | Superstructure                          |          |       |
|                                                                                             | 2.4       | Stairs and Ramps                        |          |       |
| Level 2                                                                                     | 2.4.1     | Stairs Space                            | 34       | m2    |
| Level 1                                                                                     | 2.4.1     | Stairs Space                            | 34       | m2    |
| Level 0                                                                                     | 2.4.1     | Stairs Space                            | 34       | m2    |
| Additional Extra Space                                                                      | 2.4.1     | Stairs Space                            | 34       | m2    |
|                                                                                             | 2.5       | External Walls                          |          |       |
| South Elevation                                                                             | 2.5.3     | Metal Louvre (over exposed concrete)    | 3007.1   | m2    |
| North Elevation                                                                             | 2.5.3     | Metal Louvre Screen                     | 520.0    | m2    |
| South Elevation                                                                             | 2.5.3     | Metal Louvre Screen                     | 508.0    | m2    |
| East Elevation                                                                              |           | Exposed Concrete                        | 1257.6   | m2    |
| East Elevation                                                                              | 2.5.3     | Metal Louvre Screen                     | 157.3    | m2    |
| West Elevation                                                                              | 2.5.3     | Metal Louvre Screen                     | 157.3    | m2    |
|                                                                                             | 2.5.5     | SFS Frame for Metal Screen              | 147.7    | m2    |
|                                                                                             | 2.5.4     | Paint for External Walls                | 9387.1   | m2    |
|                                                                                             | 2.6       | Windows and External Doors              |          |       |
| Floor 1                                                                                     | 2.6.1     | External Doors Floor 1                  | 6        | Unit  |
| Floor 2                                                                                     | 2.6.2     | External Windows                        | 0        | m2    |
| Floor 3                                                                                     | 2.6.2     | External Windows                        | 0        | m2    |
|                                                                                             | 2.7       | Internal Walls and Partitions           |          |       |
|                                                                                             | 2.8.1     | Internal Doors                          | 82.0     | Unit  |
|                                                                                             | 3         | Finishes                                |          |       |
|                                                                                             | 3.1       | Wall Finishes                           |          |       |
| Assumption                                                                                  | 3.1.1     | Paint                                   | 17843.2  | m2    |
|                                                                                             | 3.2       | Floor Finishes                          |          |       |
| Circulation Spaces (Floors 1,2,3)                                                           | 3.2.1     | Screed                                  | 1354.0   | m2    |
| Electrical Rooms (Floors 1,2,3)                                                             | 3.2.1     | Screed                                  | 2129     | m2    |
| Lobby (Floors 1,2,3)                                                                        | 3.2.1     | Screed                                  | 180.0    | m2    |
| Mechanical Rooms (Floors 1,2,3)                                                             | 3.2.1     | Screed                                  | 1103     | m2    |
|                                                                                             | 3.3       | Ceiling Finishes                        |          |       |
| Ground Floor                                                                                | 3.3.1     | Ceiling Finishes                        | 1790     | m2    |
| First Floor                                                                                 | 3.3.1     | Ceiling Finishes                        | 1894.0   | m2    |
| Second Floor                                                                                | 3.3.1     | Ceiling Finishes                        | 1896.0   | m2    |
|                                                                                             | 2.3       | Roof                                    |          |       |
|                                                                                             | 2.3.2     | PV Panel roof                           | 948      | m2    |
|                                                                                             | 2.3.1     | Screed for roof                         | 1896.0   | m2    |
|                                                                                             | 5         | Services                                |          |       |
|                                                                                             | 5.6.4     | Energy Centre Mech Plant Rm             | 29       | Units |
|                                                                                             | 5.6.1     | Energy Centre Roof                      | 14       | Units |
| Assumption for average carbon emissions rate for all other MEP elements based on total area |           |                                         | 6208     | M2    |

**Table D.4:** List of Materials included in the DC Embodied Carbon model (provided by AtkinsRéalis)

| Building Element                                                                            | RICS Code | Material Name                      | Quantity | Unit  |
|---------------------------------------------------------------------------------------------|-----------|------------------------------------|----------|-------|
|                                                                                             | 1.1       | Substructure                       |          |       |
| Foundations                                                                                 | 1.1.1     | Steel Rebar                        | 937059   | kg    |
| Foundations                                                                                 | 1.1.2     | Concrete                           | 9370.59  | m3    |
|                                                                                             | 2         | Superstructure                     |          |       |
|                                                                                             | 2.1       | Frame                              |          |       |
|                                                                                             |           | Steel Frames                       | 4693.33  | Tons  |
| Beams                                                                                       | 2.1.1     | Steel                              | 1968.7   | Tons  |
| Columns                                                                                     | 2.1.1     | Steel                              | 2724.63  | Tons  |
|                                                                                             | 2.2       | Upper floors                       |          |       |
| Floors                                                                                      | 2.2.1     | Concrete                           | 7417.76  | m3    |
| Floors                                                                                      | 2.2.2     | Reinforcement Steel Rebar          | 815953.6 | kg    |
|                                                                                             | 2.5       | External Walls                     |          |       |
| Walls                                                                                       | 2.5.1     | Concrete                           | 2796.63  | m3    |
| Walls                                                                                       | 2.5.2     | Reinforcement Steel Rebar          | 223730.4 | kg    |
|                                                                                             | 2.4       | Stairs and Ramps                   |          |       |
|                                                                                             | 2.4.1     | Fire Fighting Stairs Floor 1       | 135      | m2    |
|                                                                                             | 2.4.2     | Stairs Floor 1                     | 34       | m2    |
|                                                                                             | 2.4.3     | Stairs Floor 3                     | 33       | m2    |
|                                                                                             | 2.4.4     | Fire Fighting Stairs Floor 2       | 120      | m2    |
|                                                                                             | 2.5       | External Walls                     |          |       |
| West Elevation                                                                              | 2.5.1     | Metal Panel 01                     | 3695.7   | m2    |
| Southeast Elevation                                                                         | 2.5.1     | Metal Panel 01                     | 3695.7   | m2    |
| East Elevation                                                                              | 2.5.1     | Metal Panel 01                     | 1323.81  | m2    |
| Southeast Elevation                                                                         | 2.5.2     | Curtain Walling with Solar Shading | 450      | m2    |
| North Elevation                                                                             | 2.5.2     | Curtain Walling with Solar Shading | 460.3    | m2    |
| West Elevation                                                                              | 2.5.2     | Curtain Walling with Solar Shading | 1263.4   | m2    |
|                                                                                             | 2.5.1     | SFS Frame for Metal Panel 01       | 958.6731 | m2    |
|                                                                                             | 2.6       | Windows and External Doors         |          |       |
|                                                                                             | 2.6.1     | External Doors                     | 8        | Units |
|                                                                                             | 2.7       | Internal Walls and Partitions      |          |       |
|                                                                                             | 2.7.2     | Floor Level 1 Partitions           | 4176     | m2    |
|                                                                                             | 2.7.2     | Floor Level 2 Partitions           | 4176     | m2    |
|                                                                                             | 2.7.2     | Floor Level 3 Partitions           | 4176     | m2    |
|                                                                                             | 2.8       | Internal Doors                     |          |       |
|                                                                                             | 2.8.1     | Internal Doors                     | 414      | Units |
|                                                                                             | 3         | Finishes                           |          |       |
|                                                                                             | 3.1       | Wall Finishes                      |          |       |
| Assumption                                                                                  | 3.1.1     | Paint                              | 25056    | m2    |
|                                                                                             | 2.7.2     | Render for Internal Partitions     | 12528    | m2    |
|                                                                                             | 3.2       | Floor Finishes                     | 11243    | m2    |
| Assumption                                                                                  | 3.2.1     | Screed Floor 1                     | 5297     | m2    |
|                                                                                             | 3.2.1     | Screed Floor 2                     | 2948     | m2    |
|                                                                                             | 3.2.1     | Screed Floor 3                     | 2998     | m2    |
| Fit Out Space                                                                               | 3.2.2     | Tiled floor 1                      | 2464     | m2    |
|                                                                                             | 3.2.2     | Tiled floor 2                      | 4928     | m2    |
|                                                                                             | 3.2.2     | Tiled floor 3                      | 4928     | m2    |
|                                                                                             | 3.3       | Ceiling Finishes                   |          |       |
| Floor 3                                                                                     | 3.3.1     | Ceiling Finishes                   | 7947     | m2    |
| Floor 2                                                                                     | 3.3.1     | Ceiling Finishes                   | 7860     | m2    |
| Floor 1                                                                                     | 3.3.1     | Ceiling Finishes                   | 8109     | m2    |
|                                                                                             | 2.3       | Roof Finishes                      |          |       |
|                                                                                             | 2.3.1     | Flat metal roof                    | 8497.5   | m2    |
|                                                                                             | 2.3.2     | Green Roof                         | 1650     | m2    |
|                                                                                             | 2.3.2     | PV Panels for roof                 | 660      | m2    |
|                                                                                             | 5         | Services                           |          |       |
|                                                                                             | 5.6.7     | Data Hall Ground Floor 01          | 150      | Units |
|                                                                                             | 5.6.1.1   | Data Hall Roof - RL                | 7        | Units |
|                                                                                             | 5.7       | Data Hall Roof - RL                | 1        | Units |
|                                                                                             | 5.6.5     | Data Hall Roof - RL                | 54       | Units |
|                                                                                             | 5.6.3     | Data Hall Roof - RL (west)         | 18       | Units |
|                                                                                             | 5.7       | Data Hall Roof - RL (west)         | 6        | Units |
|                                                                                             | 5.7       | Data Hall Roof - RL (west)         | 6        | Units |
| Assumption for average carbon emissions rate for all other MEP elements based on total area |           |                                    | 26,496   | M2    |

**Table D.5:** List of Materials included in the External Works Embodied Carbon model (provided by AtkinsRéalis)

| Description                             | Quantity | Unit |
|-----------------------------------------|----------|------|
| Site Clearance (general)                | 150000   | m2   |
| Earthworks: Cut                         | 444807   | m3   |
| Earthworks: fill                        | 323836   | m3   |
| Topsoil                                 | 19739    | m3   |
| Pipework 150mm                          | 2952     | m    |
| Pipework 225mm                          | 2952     | m    |
| Pipework (incl bends) 150mm             | 15663    | m    |
| Pipework (incl bends) 300mm             | 4545     | m    |
| Pipework DN100-SDR11mm                  | 750      | m    |
| Pipework DN400-SDR11mm                  | 1050     | m    |
| Geo-textile: Geosynthetic membrane road | 10774    | m2   |
| PV Panels                               | 23500    | m2   |
| PV Panels                               | 8100     | m2   |
| Asphalt Road                            | 15453    | m2   |
| Concrete footpath                       | 4420     | m2   |
| Concrete Yard                           | 11023    | m2   |
| Gravel Road                             | 7472     | m2   |
| Grasscrete                              | 1100     | m2   |
| Gravel Yard                             | 2202     | m2   |

**Table D.6:** List of Materials included in the Bio-Solar Façade Embodied Carbon model  
(provided by AtkinsRéalis)

| Building Element | RICS Code | Material Name                                    | Quantity | Unit |
|------------------|-----------|--------------------------------------------------|----------|------|
|                  | 1         | Substructure                                     |          |      |
|                  | 1.1       | Substructure                                     |          |      |
| Foundations      | 1.1.1     | Reinforcement                                    | 66,285.0 | kg   |
| Foundations      | 1.1.2     | Concrete                                         | 662.9    | m3   |
|                  | 2         | Superstructure                                   |          |      |
|                  | 2.1       | Frame                                            |          |      |
|                  |           | Steel Frames                                     | 153.042  | Tons |
| Frame Structure  | 2.1.1     | SHS 180x180x10 S355 -<br>50.7 kg/m - 67.7 m long | 130.88   | Tons |
| Frame Structure  | 2.1.1     | SHS 120x120x8 S355 -<br>27.9 kg/m - 21.8m long   | 22.15    | Tons |
|                  | 3         | Finishes                                         |          |      |
| Façade Panels    | 3.1       | Extra Wall - Metal Mesh                          | 292.8    | m2   |
| Façade Panels    | 3.2       | Extra Wall - Solar Panels                        | 1061.4   | m2   |
| Façade Panels    | 3.3       | Extra Wall - Green Panels                        | 366      | m2   |



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## Appendix E

### Chapter 15 Archaeology, Architecture and Cultural Heritage Appendices

- Description of the Sources Used in Chapter 15
- Relevant Legislation in Chapter 15
- Glossary of Impact Assessment and Assessment Methodology for Chapter 15

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## **Description of the Sources Used in Chapter 15**

**Record of Monuments and Places (RMP)** is a list of archaeological sites known to the National Monuments Section, which are afforded legal protection under Section 12 of the 1994 National Monuments Act and are published as a record.

**Sites and Monuments Record (SMR)** holds documentary evidence and field inspections of all known archaeological sites and monuments. Some information is also held about archaeological sites and monuments whose precise location is not known e.g. only a site type and townland are recorded. These are known to the National Monuments Section as 'un-located sites' and cannot be afforded legal protection due to lack of locational information. As a result, these are omitted from the Record of Monuments and Places. SMR sites are also listed on a website maintained by the Department of Housing, Local Government, and Heritage (DHLGH) – [www.archaeology.ie](http://www.archaeology.ie).

**National Monuments** in State Care Database is a list of all the National Monuments in State guardianship or ownership. Each is assigned a National Monument number whether in guardianship or ownership and has a brief description of the remains of each Monument.

The Minister for the DHLGH may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

**Preservation Orders List** contains information on Preservation Orders and/or Temporary Preservation Orders, which have been assigned to a site or sites. Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

**Register of Historic Monuments** was established under Section 5 of the 1987 National Monuments Act, which requires the Minister to establish and maintain such a record. Historic monuments and archaeological areas present on the register are afforded statutory protection under the 1987 Act. The register also includes sites under Preservation Orders and Temporary Preservation Orders. All registered monuments are included in the Record of Monuments and Places.

**The topographical files of the National Museum of Ireland** are the national archive of all known finds recorded by the National Museum. This archive relates primarily to artefacts but also includes references to monuments and unique records of previous excavations. The find spots of artefacts are important sources of information on the discovery of sites of archaeological significance. Cartographic sources are important in tracing land use development within the development area as well as providing important topographical information on areas of archaeological potential and the development of buildings. Cartographic analysis of all relevant maps has been made to identify any topographical anomalies or structures that no longer remain within the landscape.

**Cartographic sources** are important in tracing land use development within the development area as well as providing important topographical information on areas of archaeological potential and the development of buildings. Cartographic analysis of all relevant maps has been made to identify any topographical anomalies or structures that no longer remain within the landscape.

**Documentary sources** were consulted to gain background information on the archaeological, architectural, and cultural heritage landscape of the Proposed Development area.

**Aerial photographic coverage** is an important source of information regarding the precise location of sites and their extent. It also provides initial information on the terrain and its likely

potential for archaeology. A number of sources were consulted including aerial photographs held by the Ordnance Survey, Google Earth, and Bing Maps.

**Excavations Bulletin** is a summary publication that has been produced every year since 1970. This summarises every archaeological excavation that has taken place in Ireland during that year up until 2010 and since 1987 has been edited by Isabel Bennett. This information is vital when examining the archaeological content of any area, which may not have been recorded under the SMR and RMP files. This information is also available online ([www.excavations.ie](http://www.excavations.ie)) from 1970-2023.

**Place Names** are an important part of understanding an area's archaeology, history, and cultural heritage. They can be used for generations and, in some cases, have been found to have their roots deep in the historical past. The main references used for the place name analysis are Irish Local Names Explained by P.W. Joyce (1870) and the Place Names Database of Ireland.

#### **Record of Protected Structures**

The Louth County Development Plan 2021-2027 contain a catalogue of all the Protected Structures and archaeological sites within the county. was consulted to obtain information on cultural heritage sites in and within the immediate vicinity of the Proposed Development area.

**The National Inventory of Architectural Heritage** is a state initiative established under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 tasked with making a nationwide record of significant local, regional, national and international structures, which in turn provides county councils with a guide as to what structures to list within the Record of Protected Structures. The NIAH have also carried out a nationwide desk-based survey of historic gardens, including demesnes that surround large houses.

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## **Relevant Legislation in Chapter 15**

The Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 was enacted in October 2023 and is now law. The Minister for Housing, Local Government and Heritage commenced certain provisions in May 2024 (S.I. No.: 252/2024), however until the Act is fully commenced the National Monuments Acts have therefore not yet been repealed and remain in force.

### **National Monuments Legislation (1930-2004)**

The National Monument Act, 1930 (as amended) provides the formal legal mechanism to protect monuments in Ireland. Protection of a monument is provided via:

Record of Monuments and Places (RMP);

National Monument in the ownership or guardianship of the Minister for Arts, Heritage, Regional, Rural & Gaeltacht Affairs or a Local Authority;

National Monument subject to a Preservation Order (or temporary Preservation Order);

Register of Historic Monuments (RHM).

The definition of a monument is specified as:

any artificial or partly artificial building, structure or erection or group of such buildings, structures or erections;

any artificial cave, stone or natural product, whether forming part of the ground, that has been artificially carved, sculptured or worked upon or which (where it does not form part of the place where it is) appears to have been purposely put or arranged in position;

any, or any part of any, prehistoric or ancient tomb, grave or burial deposit, or (ii) ritual, industrial or habitation site; and

any place comprising the remains or traces of any such building, structure or erection, any cave, stone or natural product or any such tomb, grave, burial deposit or ritual, industrial or habitation site.

Under Section 14 of the Principal Act (1930):

It shall be unlawful...

to demolish or remove wholly or in part or to disfigure, deface, alter, or in any manner injure or interfere with any such national monument without or otherwise than in accordance with the consent hereinafter mentioned (a licence issued by the Office of Public Works National Monuments Branch),

or

to excavate, dig, plough or otherwise disturb the ground within, around, or in the proximity to any such national monument without or otherwise than in accordance...

Under Amendment to Section 23 of the Principal Act (1930):

A person who finds an archaeological object shall, within four days after the finding, make a report of it to a member of the Garda Síochána...or the Director of the National Museum...

The latter is of relevance to any finds made during a watching brief.

In the 1994 Amendment of Section 12 of the Principal Act (1930), all the sites and 'places' recorded by the Sites and Monuments Record of the Office of Public Works are provided with a new status in law. This new status provides a level of protection to the listed sites that is equivalent to that accorded to 'registered' sites [Section 8(1), National Monuments Amendment Act 1954] as follows:

The Commissioners shall establish and maintain a record of monuments and places where they believe there are monuments and the record shall be comprised of a list of monuments and such

places and a map or maps showing each monument and such place in respect of each county in the State.

The Commissioners shall cause to be exhibited in a prescribed manner in each county the list and map or maps of the county drawn up and publish in a prescribed manner information about when and where the lists and maps may be consulted.

In addition, when the owner or occupier (not being the Commissioners) of a monument or place which has been recorded, or any person proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such monument or place, he shall give notice in writing of his proposal to carry out the work to the Commissioners and shall not, except in the case of urgent necessity and with the consent of the Commissioners, commence the work for a period of two months after having given the notice.

The National Monuments Amendment Act enacted in 2004 provides clarification in relation to the division of responsibilities between the Minister of Environment, Heritage and Local Government, Finance and Arts, Sports and Tourism together with the Commissioners of Public Works. The Minister of Environment, Heritage and Local Government will issue directions relating to archaeological works and will be advised by the National Monuments Section and the National Museum of Ireland. The Act gives discretion to the Minister of Environment, Heritage and Local Government to grant consent or issue directions in relation to road developments (Section 49 and 51) approved by An Bord Pleanála and/or in relation to the discovery of National Monuments.

14A. (1) The consent of the Minister under section 14 of this Act and any further consent or licence under any other provision of the National Monuments Acts 1930 to 2004 shall not be required where the works involved are connected with an approved road development.

14A. (2) Any works of an archaeological nature that are carried out in respect of an approved road development shall be carried out in accordance with the directions of the Minister, which directions shall be issued following consultation by the minister with the Director of the National Museum of Ireland.

Subsection 14A (4) Where a national monument has been discovered to which subsection (3) of this section relates, then the road authority carrying out the road development shall report the discovery to the Minister subject to subsection (7) of this section, and pending any directions by the Minister under paragraph (d) of this subsection, no works which would interfere with the monument shall be carried out, except works urgently required to secure its preservation carried out in accordance with such measures as may be specified by the Minister.

The Minister will consult with the Director of the National Museum of Ireland for a period not longer than 14 days before issuing further directions in relation to the national monument.

The Minister will not be restricted to archaeological considerations alone, but will also consider the wider public interest.

### **Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999**

This Act provides for the establishment of a national inventory of architectural heritage and historic monuments.

Section 1 of the act defines “architectural heritage” as:

- (a) all structures and buildings together with their settings and attendant grounds, fixtures and fittings,
- (b) groups of such structures and buildings, and,
- (c) sites

which are of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.



Section 2 of the Act states that the Minister (for Arts, Heritage, Gaeltacht and the Islands) shall establish the NIAH, determining its form and content, defining the categories of architectural heritage, and specifying to which category each entry belongs. The information contained within the inventory will be made available to planning authorities, having regard to the security and privacy of both property and persons involved.

Section 3 of the Act states that the Minister may appoint officers, who may in turn request access to premises listed in the inventory from the occupiers of these buildings. The officer is required to inform the occupier of the building why entry is necessary, and in the event of a refusal, can apply for a warrant to enter the premises.

Section 4 of the Act states that obstruction of an officer or a refusal to comply with requirements of entry will result in the owner or occupier being guilty of an offence.

Section 5 of the Act states that sanitary authorities who carry out works on a monument covered by this Act will as far as possible preserve the monument with the proviso that its condition is not a danger to any person or property, and that the sanitation authority will inform the Minister that the works have been carried out.

The provisions in the Act are in addition to and not a substitution for provisions of the National Monument Act (1930–94), and the protection of monuments in the National Monuments Act is extended to the monuments covered by the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act (1999).

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## **Glossary of Impact Assessment and Assessment Methodology for Chapter 15**

### **Types of Effects**

Potential effects on the receiving cultural heritage<sup>194</sup> environment can be described as direct physical effects, indirect physical effects, and effects on setting (i.e. the surroundings in which a cultural heritage asset can be experienced; Historic England 2017).

Direct physical effects are those development activities that directly cause damage to the fabric of a cultural heritage asset. Typically, these activities are related to construction works (e.g. they could include excavation of foundations, earthmoving / site preparation creation of access roads, cycle paths, and the excavation of service trenches).

Indirect physical effects are those processes, triggered by development activity, that lead to the degradation of cultural heritage assets.

Effects on the setting of cultural heritage assets describe how the presence of a development changes the surroundings of an asset in such a way that it affects (positively or negatively) the heritage significance of that asset. Visual effects are most commonly encountered. Such effects may be encountered at all stages in the life cycle of a development, but they are only likely to be considered significant during the prolonged operational life of the development.

Types of effect, as defined by the EPA Guidelines on Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA 2022):

*Cumulative Effect* – The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant, effects.

*Do Nothing Effect* – The environment as it would be in the future should the subject project not be carried out.

*Indeterminable Effect* – When the full consequences of a change in the environment cannot be described.

*Irreversible Effect* – When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.

*Residual Effect* – The degree of environmental change that will occur after the proposed mitigation measures have taken effect.

*‘Worst case’ Effect* – The effects arising from a project in the case where mitigation measures substantially fail; and

*Indirect or Secondary Effects* – Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.

### **Quality of Effects**

Effects on the cultural heritage environment are assessed in terms of their quality, i.e. positive, negative, neutral:

Negative Effect: A change that will detract from or permanently remove an cultural heritage asset from the landscape;

Neutral Effect: A change that does not affect cultural heritage; and

Positive Effect: A change that improves or enhances the setting of a cultural heritage asset.

### **Duration of Effects**

The duration of an effect can be as follows:

Temporary Effect: Effect lasting for one year or less;

<sup>194</sup> Cultural Heritage includes archaeology, architectural heritage, and folklore and history

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Short-term Effect: Effect lasting one to seven years;  
Medium-term Effect: Effect lasting seven to fifteen years;  
Long-term Effect: Effect lasting fifteen to sixty years; and  
Permanent Effect: Effect lasting over sixty years.

### Assessment Methodology

This assessment methodology has regard to the EPA assessment criteria (EPA 2022) and to the National Roads Authority (NRA) Guidelines for the Assessment of Archaeological Heritage Impact of National Road Schemes (hereafter referred to as the NRA Guidelines) (NRA 2005).

Cultural heritage sites are a non-renewable resource and such assets are generally considered to be location sensitive. In this context, any change to their environment, such as construction activity and ground disturbance works, could adversely affect these sites.

### Significance / Sensitivity Criteria

In accordance with EPA Guidelines (EPA 2022), the context, character, significance and sensitivity of each cultural heritage asset requires evaluation and the significance of the effect is then determined by considering the significance / sensitivity of the asset and the predicted magnitude of the effect.

The significance / sensitivity can be ascertained by looking at the following criteria: the existing status (level of protection), condition or preservation, documentation or historical significance, group value, rarity, visibility in the landscape, fragility or vulnerability, and amenity value (Table 1). While these criteria contribute to the significance of a feature they should not be treated as definitive. These criteria are indicators which contribute to a wider judgement based on the individual circumstances of these cultural heritage assets.

**Table E.1:** Explanation of Cultural Heritage Asset Assessment Criteria

| Criteria                                           | Explanation                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Existing Status                                    | The level of protection associated with a cultural heritage asset is an important consideration.                                                                                                                                                                                                                                                                                                        |
| Condition / Preservation / Integrity               | The survival of a cultural heritage asset's archaeological potential both above and below ground is an important consideration and should be assessed in relation to its present condition and surviving features. Well-preserved sites should be highlighted, this assessment can only be based on a field inspection.                                                                                 |
| Documentation / Data                               | The significance of a cultural heritage asset may be enhanced by the existence of records of previous investigations or contemporary documentation supported by written evidence or historic maps. Sites with a definite historical association or an example of a notable event or person should be highlighted.                                                                                       |
| Group Value / Character                            | The value of a single cultural heritage asset may be greatly enhanced by its association with related contemporary monuments or with monuments from different periods indicating an extended time presence in any specific area. In some cases it may be preferable to protect the complete group, including associated and adjacent land, rather than to protect isolated monuments within that group. |
| Rarity / Character                                 | The rarity of some cultural heritage asset types can be a central factor affecting response strategies for development, whatever the condition of the individual feature. It is important to recognise sites that have a limited distribution.                                                                                                                                                          |
| Visibility in the landscape/ Character / Integrity | Cultural heritage assets that are highly visible in the landscape have a heightened physical presence. The inter-visibility between monuments may also be explored in this category.                                                                                                                                                                                                                    |
| Fragility / Vulnerability /                        | It is important to assess the level of threat to a cultural heritage asset from erosion, natural degradation, agricultural activity, land clearance, neglect, careless treatment or                                                                                                                                                                                                                     |

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| Criteria                  | Explanation                                                                                      |
|---------------------------|--------------------------------------------------------------------------------------------------|
| Integrity                 | development.                                                                                     |
| Amenity Value / Character | Regard should be taken of the existing and potential amenity value of a cultural heritage asset. |

An evaluation of the significance / sensitivity of cultural heritage assets is based on their designation and on the extent to which these assets contribute to the cultural heritage environment, though their individual or group qualities, either directly or potentially. Table 2 presents the scale of significance / sensitivity together with criteria. It has been compiled by Courtney Deery Heritage Consultancy Ltd, based on standard authorities and guidelines as listed at the end of this appendix. Undesignated cultural heritage sites can be assigned a low, medium or high sensitivity value, taking into consideration the criteria cited in Table 1 (e.g. condition, character, integrity or preservation, data, group value, rarity, visibility in the landscape, fragility or vulnerability, and amenity value).

**Table E.2: Significance / Sensitivity Criteria**

| Sensitivity / Significance | Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very high                  | World Heritage Properties and properties on the Tentative List.<br><br>Built heritage assets, historic gardens and designed landscapes rated as being of international importance by the National Inventory of Architectural Heritage (NIAH).                                                                                                                                                                                                                                                                                                                                          |
| High                       | National Monuments.<br><br>Protected Structures, built heritage assets, historic gardens and designed landscapes, rated as being of national importance by the NIAH, and structures within an Architectural Conservation Area (ACA).<br><br>Undesignated cultural heritage sites considered to be of national importance.                                                                                                                                                                                                                                                              |
| Medium                     | Recorded Monuments (RMP sites, and SMR sites scheduled for inclusion in the next revision of the RMP).<br><br>Protected Structures / NIAH sites and ACAs.<br><br>Newly identified archaeological sites, confirmed through archaeological investigation, to be added to the SMR.<br><br>Undesignated cultural heritage sites considered to be of regional importance.                                                                                                                                                                                                                   |
| Low                        | Assets compromised by poor preservation and/or poor survival of contextual associations.<br><br>Sites listed in the County or City Industrial Heritage Records, Record of Protected Structures (RPS) and NIAH Building for which there are no upstanding remains.<br><br>Upstanding sites listed in the County or City Industrial Heritage Records considered to be of local importance.<br><br>Undisturbed greenfield areas and riverine environs, which have an inherent archaeological potential.<br><br>Undesignated cultural heritage sites considered to be of local importance. |
| Negligible                 | Assets with very little or no surviving cultural heritage interest.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Unknown                    | The importance of the asset has not yet been ascertained (e.g. a LiDAR feature that may or may not be archaeological). In such cases, the significance of effect will be 'Indeterminable'.                                                                                                                                                                                                                                                                                                                                                                                             |

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**Table E.3: Description of Criteria**

| Criteria                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| World Heritage Properties        | World Heritage Properties as designated by the United Nations Educational, Scientific and Cultural Organization (UNESCO) and properties on the Tentative List.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| National Monuments               | The National Monuments Act (1930, Section 2) defines a 'National Monument' as 'a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto'. The National Monuments legislation legally protects access to and the visual amenity associated with National Monuments and requires consent from the Minister for invasive works in their vicinity.                                                                                                                                                                                                                                                                                                                      |
| Recorded Monuments               | The primary source of information for archaeology is the Record of Monuments and Places (RMP) maintained by the Department of Housing, Local Government and Heritage (DHLGH). The RMP documents known upstanding archaeological monuments, their original location (in cases of destroyed monuments) and the position of possible sites in rural areas identified as cropmarks on vertical aerial photographs dating to before 1700 AD (with some later ones also being included). It is based on a comprehensive range of published and publicly available documentary and cartographic sources. For the purpose of the assessment, the Sites and Monument Record (SMR) data and mapping as updated by the Archaeological Survey of Ireland ( <a href="http://www.archaeology.ie">www.archaeology.ie</a> ) was also examined. |
| Protected Structures             | A 'Protected Structure' is a structure that a planning authority considers to be of special interest from an architectural, historical, archaeological, artistic, cultural, scientific, social, or technical point of view and is included in its Record of Protected Structures (RPS). It may be a building or part of a building which is of significance because of its architectural or artistic quality, or its setting, or because of its association with commercial, cultural, economic, industrial, military, political, social, or religious history.                                                                                                                                                                                                                                                                |
| Architectural Conservation Areas | An Architectural Conservation Area (ACA) is a place, area, group of structures or townscapes that is of special interest and that has been afforded statutory protection by the planning authority in accordance with Section 81 of the Planning & Development Act.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| NIAH                             | The National Inventory of Architectural Heritage (NIAH) is a state initiative established on a statutory basis, to identify, record, and evaluate the post-1700 architectural heritage of Ireland, uniformly and consistently as an aid in the protection and conservation of the built heritage. NIAH surveys provide the basis for the recommendations of the Minister for Housing, Local Government and Heritage to the planning authorities for the inclusion of particular structures in their Record of Protected Structures (RPS).                                                                                                                                                                                                                                                                                      |
| Undesignated Sites               | Newly identified archaeological sites that have been confirmed through archaeological investigation (monitoring, testing, excavation, geophysical survey) are considered to be of medium importance. Such sites are undesignated as they have yet to be added to the SMR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                  | Potential or undesignated cultural heritage sites identified through aerial photography, historic mapping, stray finds are considered to be of low sensitivity, as they have yet to be ground-truthed through archaeological investigation. Similarly, undisturbed greenfield areas and riverine environs, which have an inherent but as yet unproven archaeological potential are considered to be of low sensitivity.                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                  | Zones of archaeological potential (ZAP) can be defined as areas within the urban and rural landscape that possess the potential to contain archaeological remains due to the settlement history of a place and or to the presence of topographical features such as rivers, lakes and high, defensible ground                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                  | Sites / features recorded in county / city industrial heritage surveys, where these are not designated assets.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

### Magnitude of Effect

When assessing the effect magnitude, the following criteria need to be considered:

Extent – size, scale and spatial distributions of the effect;



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Duration – period of time over which the effect will occur;

Frequency – how often the effect will occur; and

Context – how will the extent, duration and frequency contrast with the accepted baseline conditions (see Table E.1).

**Table E.4: Magnitude of Effect Criteria**

| Effect Magnitude | Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High             | These effects arise where a cultural heritage asset is completely and irreversibly destroyed by a Proposed Development. A change such that the value of the asset is totally altered or destroyed, leading to a complete loss of character, integrity and data about the site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Medium           | An effect which, by its magnitude, duration or intensity alters an important / significant aspect of the environment. An effect like this would be where a cultural heritage asset would be effected upon leading to a significant loss of character, integrity and data about the site.<br><br>Or an effect which by its magnitude results in the partial loss of a historic structure (including fabric loss or alteration) or grounds including the part removal of buildings or features or part removal of demesne land (e.g. severance, visual intrusion or degradation of setting and amenity).<br><br>A permanent positive effect that enhances or restores the character and / or setting of an upstanding cultural heritage site in a clearly noticeable manner. |
| Low              | A low effect arises where a change to the site is proposed which though noticeable is not such that the cultural heritage character / integrity of the site is significantly compromised, and where there is no significant loss of data about the site.<br><br>A positive effect that results in partial enhancement of the character and / or setting of an upstanding cultural heritage site in the medium to long-term.                                                                                                                                                                                                                                                                                                                                                |
| Negligible       | An effect which causes very minor changes in the character of the environment and does not directly effect a cultural heritage asset, or affect the appreciation or significance of the asset. There would be very minor changes to the character and integrity of the asset and no loss of data about the site.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

### **Significance of Effect**

The EPA Revised Guidelines on the Information to be Contained in Environmental Impact Statements (EIS) (EPA 2017) contained two additional levels of significance of effect: Very Significant and Not Significant (Table E.5). These levels have been retained in the current EPA Guidelines (2022).

**Table E.5: Significance of Effects (EPA 2022)**

| Significance of Effect | Description                                                                                                                                                                        |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very Significant       | An effect which by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment, for example in this case a monument |
| Not Significant        | An effect which causes noticeable changes in the character of the environment but without noticeable consequences.                                                                 |

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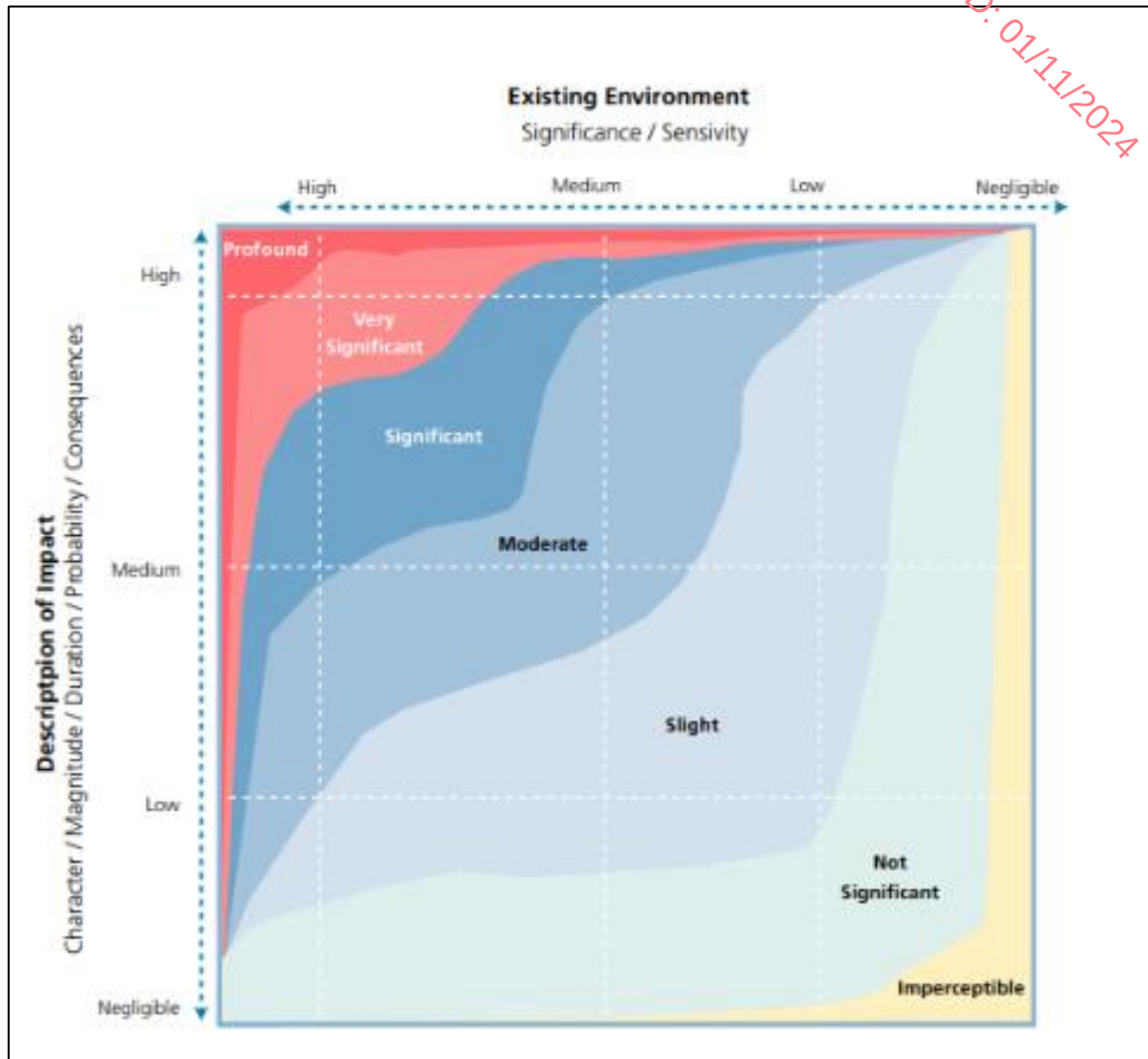


**Figure E.1:** Chart Showing Typical Classifications of the Significance of Effects, from the EPA Guidelines on Information to be Contained in EIAR (EPA 2022).

The likely significance of effects is determined by considering the baseline rating or sensitivity value of the asset upon which the effect has an effect and the magnitude of the effect (Figure E.1). The effect significance is defined as Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant, or Profound (Table E.6).

**Table E.6:** Defining Significance of Effects

| Effect          | Definition                                                                                                                                                                                       |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Imperceptible   | An effect capable of measurement but without noticeable consequences.                                                                                                                            |
| Not Significant | An effect which causes noticeable changes in the character of the environment but without significant consequences.                                                                              |
| Slight          | An effect which causes minor changes in the character of the environment and does not affect a cultural heritage asset in a moderate or significant manner.                                      |
| Moderate        | A moderate effect arises where a change to the site is proposed which though noticeable, does not lead to a significant loss of character, integrity and data about the cultural heritage asset. |

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| Effect           | Definition                                                                                                                                                                                                                                                                                              |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Significant      | An effect which, by its magnitude, duration or intensity, alters an important aspect of the environment. An effect like this would be where part or all of a site would be permanently effected upon, leading to a significant loss of character, integrity and data about the cultural heritage asset. |
| Very Significant | An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.                                                                                                                                                                 |
| Profound         | Applies where mitigation would be unlikely to remove adverse effects. Reserved for adverse, negative effects only. These effects arise where a cultural heritage asset is completely and irreversibly destroyed by a Proposed Development.                                                              |