Attachment 1
EIA Screening Assessment

EIA Screening Report

SSE Generation Ireland Ltd
Planning Support
IE0312377-22-RP-0017, Issue: C

Issue date: 09 Aug 2023

Document Sign Off

EIA Screening Report

SSE Generation Ireland Ltd
Planning Support
IE0312377-22-RP-0017, Issue C

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Appendix A

Appraisal in accordance with Schedule 5 Part 1, Planning & Development Regulations

Appendix B

Appraisal in accordance with Schedule 5 Part 2, Planning & Development Regulations

Changes in this revision are shown in purple font with a vertical line in the right hand margin

Executive Summary

PM Group has prepared this Environmental Impact Assessment (EIA) Screening Report for a proposed development comprising an Open Cycle Gas Turbine (OCGT) Generating Plant of up to 170 Megawatt (MWe) equivalent to 269MWt (subject to planning application to Meath County Council (MCC) by SSE Generation Ireland Ltd. (SSE), to be located at its existing site at Carranstown, Duleek, Co.Meath. The proposed plant will be a biofuel fired electrical power generating facility, utilising hydrotreated vegetable oil (HVO).

The plant consists of 3 no. OCGT units and will operate when demand is highest or when a shortage of supply exists on the grid. The plant design will allow for flexible operation so the plant can cater for variable high demand and respond quickly to fluctuations on the electricity grid with high efficiency.

The purpose of this screening report is to determine if the proposed development falls under a class of development that requires or may require an Environmental Impact Assessment (EIA) to be carried out, as listed in Part 1 and Part of Schedule 5 of the Planning and Development Regulations 2001 (as amended).

The screening report concludes that the scale and nature of the proposed development are not considered to present a risk of significant environmental effect during the construction and operational phases, an EIA is not required to be undertaken. The proposed development has been screened against Part 1 and Part 2 of Schedule 5 of the Planning and Development Regulations 2001 (as amended) and is below the relevant thresholds.

As with all construction works, there is potential for the generation of dust, noise and waste. However, these aspects will be managed by implementation of routine good practice construction measures and adherence to a project construction environmental management plan.

During the operational phase of the proposed development, the site will be operated in accordance with an Industrial Emissions Licence from the Environmental Protection Agency to ensure that potentials effects to the environment are minimised. Mitigation measures for the operational phase have been further detailed in the Environmental Report submitted with this planning application.

1 Introduction

PM Group has prepared this Screening for an Environmental Impact Assessment (EIA) Report for the proposed development of an Open Cycle Gas Turbine (OCGT) Generating Plant for up to 170 Megawatt (MWe), equivalent to 269MWt, to be located at an existing SSE Generation Ireland Ltd. at Curranstown Platin, Duleek, Co. Meath. The proposed plant will be a biofuel fired power generating facility utilising hydrotreated vegetable oil (HVO).

The plant consists of 3 no. OCGT units and will operate when demand is highest or when a shortage of supply exists on the grid. The plant design will allow for flexible operation so the plant can cater for high demand and respond quickly to fluctuations on the electricity grid with high efficiency. The location of the site is shown in Figure 1.1.

The proposed development site will be 10.55 hectares in size and is currently a greenfield site. The predominant land use in the area is agriculture, primarily high-grade/arable agriculture. A large cement manufacturing plant and its associated quarry (Irish Cement Ltd) is located in approx.. 600m distance to the north of the site. In addition, Indaver Waste to Energy facility lies approx.. 400m northwest of the site across the R152 road. Directly adjacent to the north of the proposed plant is a cluster of commercial and residential buildings including a service station and a Commercial Vehicle Roadworthiness Test (CVRT) centre. Residential development in the vicinity of the site is scattered, typical of the rural location. Nearest resident property is approx. 80m from the proposed site entrance.

The purpose of this Screening Report is to determine if the proposed development falls under a class of development that requires or may require an Environmental Impact Assessment (EIA) to be carried out, as listed in Schedule 5 of the Planning and Development Regulations 2001 (as amended). The relevant infrastructure associated with the proposed development is discussed in Section 2 of this report.

Figure 1.1: Site Location and Red Line Boundary for the Proposed Development

1.1 Background

In July 2018, SSE held a pre-application consultation meeting (Case Reference PL17 .302052)[1] with An Bord Pleanála (ABP) regarding whether or not a proposed distillate fired 208MW (electrical output) Open Cycle Gas Turbine (OCGT) Generating Plant including 110kV Transmission Substation, at Platin, Carranstown, Co. Meath constitutes strategic infrastructure, as defined by the Planning and Development Act, 2000 (as amended).

ABP concluded that (a) the proposed OCGT Generating Plant did not constitute strategic infrastructure and should therefore be submitted under s34 Planning and Development Act 2000 (as amended) to Meath County Council and (b) the 110kV transmission sub-station did constitute strategic infrastructure under the provisions of Section 182A and 182B of the Planning and Development Act 2000 (as amended).

A planning application for the strategic infrastructure development of the 110kV transmission sub-station at Platin, Carranstown, Co. Meath was lodged with ABP in February 2019 (Case Reference PL17 .303678)[2]. The Board granted permission for the development in January 2020.

Following the pre-application consultation with ABP, a planning application was prepared and lodged with Meath County Council for the distillate fired 208 MWe OCGT Generating Plant (Planning Ref. no. LB190031) in January 2019. In July 2019, Meath County Council issued a notification of decision to grant permission for the development subject to conditions. However the decision by Meath County Council was the subject of a third party appeal to ABP (Case reference PL17.305028)[3].

In December 2019, ABP refused permission for the distillate fired 208 MW OCGT Generating Plant stating the following;

'It is considered that the proposed development in its current form with full reliance on the use of distillate oil, would conflict with national obligations relating to greenhouse gas emissions set out under the EU Renewable Energy Directive, would be contrary to national policy relating to the need for decarbonisation of the electricity sector, would not be supportive of the relevant provisions of the Meath County Development Plan 2013-2019, and through the specific use of distillate oil, and would constitute an unsustainable approach in relation to the provision of energy infrastructure to address intermittency in renewable power generation. The proposed development would, therefore, be contrary to the proper planning and sustainable development of the area.

Note: The Board considered that the use of the subject site for electricity generation would be fully consistent with the proper planning and sustainable of the area and noted the commentary from the applicant that a connection to gas supply is technically possible though challenging. However, having regard to the totality of Government policy on climate change, energy efficiency and the imperative for decarbonisation of the country's electricity generating system, it was determined that the fuelling of the proposed development by distillate oil is not supportable and that a proposal entailing the use of natural gas, or other fuel source and where distillate oil is not required or would perform a contingency function only, is warranted.'

SSE are now seeking planning permission for the construction of a 170 Megawatt MWe OCGT Generating Plant fuelled with hydrotreated vegetable oil (HVO). In accordance with the Commission of Utilities (CRU) requirement for 84 hours of onsite fuel storage, the plant will have 2 no. HVO fuel tanks onsite.

As the approved 110 kV Substation was planned to serve the proposed OCGT Generating Plant, construction of this development is pending approval of the proposed OCGT Generating Plant.

[1] http://www.pleanala.ie/casenum/302052.htm
[2] http://www.pleanala.ie/casenum/303678.htm
[3] http://www.pleanala.ie/casenum/305028.htm

1.2 Industrial Emissions Licence

The proposed OCGT Generating Plant will require an Industrial Emissions (IE) licence to operate. The First Schedule to the Environmental Protection Agency (EPA) Acts, 1992 (as amended) lists activities which require an IE licence. The proposed OCGT Generating Plant falls into the category of activity for which an IE Licence is required, namely "the operation of combustion installations with a rated thermal input equal to or greater than 50 MW".

The IE licence will govern the environmental management of the OCGT Generating Plant and ensure the operation of the plant and associated environmental emissions do not have any significant adverse impact on the environment. All applicable Best Available Techniques Reference (BREF) Documents as set out by the European Commission will be assessed during the licence application to ensure full compliance to best practice guidance.

An IE licence application will be submitted to the EPA following submission of the planning application.

1.3 Purpose of the Screening Study

This Environmental Impact Assessment screening has been carried out with reference to Schedule 7 of the Planning and Development Regulations 2001, as amended: *Criteria for determining whether Development listed in Part 2 of Schedule 5 should be subject to an Environmental Impact Assessment*.

The information set out in Schedule 7A of the Planning and Development Regulations 2001, as amended: *Information to be provided by the Applicant or Developer for the Purposes of Screening Sub-threshold Development for Environmental Impact Assessment* is included in an Environmental Report being submitted with the planning application for the proposed development, and is also included in summary in this report.

The purpose of this screening report is to assess whether or not the proposed development should be subject to Environmental Impact Assessment (EIA) and therefore whether an Environmental Impact Assessment Report (EIAR) should be prepared in respect of it. The primary objectives of this screening are to:

- Describe the proposed development (Section 2);
- Provide the legislative context (Section 3);
- Evaluate the proposed development in the context of mandatory thresholds for EIA, examine the potential for significant environmental effects and subsequently evaluate the proposed development in the context of sub-threshold EIA (Section 4);
- Evaluate the cumulative impacts of the proposed development (Section 4); and
- Provide conclusions of EIA Screening Assessment (Section 5).

1.3.1 Statement of Authority

This EIA Screening Report has been prepared by Aoife O'Leary, a Senior Environmental Consultant with PM Group, who has over 7 years' experience in EIA, planning, compliance and advice for a range of clients and has experience in delivery of complex environmental projects with multiple stakeholders. Past projects have included pharmaceutical, medical devices, and food and beverage sectors. Aoife has a BSc(Hons) in Environmental Science and Sustainable Technology (MTU) and a MSc in Occupational Health (UCC). Aoife is a charted environmentalist (CEnv) with the Society of the Environment. Aoife's main areas of expertise include regulatory licence (IPC/IE) compliance, regulatory/corporate auditing, and EIA. Aoife is the project manager of the Environmental Report of the Proposed Development which is documented in IE0312377-22-RP-0016 for submission with the planning application.

This EIA Screening Report has been checked by David Moore, Principal Planner with PM Group, who has over 20 years' experience in EIA, planning and compliance for a wide range of clients. Areas that David has expertise include energy, infrastructure and industrial planning and

development. David has MSc in Spatial Planning (TUD) and an Advanced Diploma in Planning and Environmental Law from the Honourable Society of King's Inn. David's main area of expertise include EIA, planning law compliance and regulatory compliance. David is a member of the Irish Planning Institute (IPI).

2 Project Description

2.1 Project Overview

The proposed development will consist of the construction of a 170 Megawatt (MWe) Open Cycle Gas Turbine (OCGT) Generating Plant for SSE Generation Ireland Ltd., to be located at a site at Carranstown, Platin, Duleek, Co. Meath. The OCGT plant will have a capacity of 170 MWe. The net thermal rating of the proposed development is 269 Megawatt (MWt). The heat output is calculated as: $m \times C_p \times \Delta T = q$

Where m = mass in kilograms, Cp = constant of specific heat, ΔT = change in temperature between exhaust stack and ambient temperature in degrees Celsius, and q = heat.

$545.8 \times 1.11 \times 444 = 268992\ (kilowatts)$

$kilowatts\ to\ megawatts\ conversion\ 268992 \div 1000 = 268.992\ MW$

The principal activity involves the combustion of HVO in a power turbine that will drive a generator for electricity production. The electricity generated will be fed to a transformer where the voltage will be stepped up for transmission from a local sub-station into the national grid. The plant will consist of 3 no. OCGTs and operate when demand is highest or when a shortage of supply exists on the grid. It is anticipated that the turbines will operate for up to 1,800 hours each per year, with higher operating times during winter months.

The proposed development will comprise a 170MW (electrical output) Open Cycle Gas Turbine (OCGT) Power Plant. The proposed development will comprise an electricity generating plant which will use Hydrotreated Vegetable Oil (HVO) as fuel and will be connected to a previously permitted 110kV substation (ABP-303678-19) and associated site works and improved access from the R152. The development comprises the following elements:

a) Three gas turbine buildings (each 990m^2) each housing 1 no. turbine, 1 no. generator and auxiliary equipment with a total of 269 MWth (thermal output) generating capacity all on concrete plinths.

b) The power plant will have three exhaust stacks (25m in height), one exhaust stack per OCGT. Therefore, each OCGT will comprise a standalone Large Combustion Plant. The power plant may need to utilise, selective catalytic reduction (SCR) (18m high, 4.5 width, 14m length) for nitrogen oxide (NOx) abatement.

c) Water treatment plant comprising:

- a 275m^2 Deionising Building (6m high x 11m wide x 25m long)
- a raw water treatment tank of 2,262m^3 (12.8m high)
- a deionised water tank (max. volume of 3,925m^3) 15.4m high
- a processed water tank of 450m^3 (9m high)
- 1 no. 20m^2 firefighting water tank of 45m^3 (2m high)
- 1 no. 25m^2 firewater module (4m high x 5m wide x 5m long)
- 1 no. sanitary foul water cesspool tank of 79m^3 located underground (1.98m high x 2.5m wide x 16m long)
- a bulk chemical storage area (4.75m wide x 7.75m long)

d) 2 no. HVO tanks (max. storage of 2300m^3 of HVO per tank),13m high with a diameter of 15m and associated fuel pumping and filtering equipment and pipework, within a 43.5m L x 45.5m W x 1.5m Bund capacity is 2970m3

e) 1 ammonia tank – (1.8m high 3.5m length with bund 2.5 m x 5 m with a height of 1.5 m)

f) 1 no. fuel polishing system (3m high x 6m wide x 24m long)

g) 2 no. 110 kV transformers each 160m^2, and each measuring (5m high x 10m wide x 15m long). 3 no. Lightning Masts (18m in height) and kiosks, cable gantry connection to the adjoining consented 110kV Substation.

h) a 520m^2 services building (6m high x 13m wide x 40m long)

i) a 160m^2 Switchgear (MV) building (5m high x 6.1m wide x 26.3m long)

j) all other miscellaneous and ancillary site works, including: 12 no. Car parking spaces and 1 No. fuel unloading bay, one lowered site platform area, new internal access roads and hard and soft landscaping including material berms (1.2m to 2m high), a temporary construction compound, temporary security building, and associated fencing.

k) New road markings, including deceleration lane approaching the site, on the R152

The proposed development will include connection to public water mains and wastewater provision, supplied by Uisce Éireann. There is no sewer connection required as foul and process waste will be collected in a sealed tank and emptied by a specialist waste service provider.

The proposed development will connect to a previously consented 110 kV substation which will be located adjacent and to the south-west of the proposed OCGT Power Plant.

The application relates to a development which comprises or is for the purposes of an activity requiring an Industrial Emissions Directive (IED) licence, and full details of the proposed development and its anticipated environmental impacts will be notified to the Environmental Protection Agency.

This is a site to which the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I. 209 of 2015) applies.

In December 2022, Uisce Éireann confirmed that a connection to the existing water network for the site can be facilitated based on a maximum instantaneous flow of 3 l/s. There is no sewer connection required as foul and process waste will be collected in a sealed tank and emptied by a specialist waste service provider.

Subject to granting of planning permission by MCC, it is anticipated works on the proposed OCGT Generating Plant will commence in Q4 2023 with first operation of the plant in Q3 2026.

2.2 Summary of Power Generating Process and Technology

The plant will utilise Open Cycle Gas Turbine technology. It will be used as a backup peaking plant to run at times of high electricity demand, and will be run in open cycle mode. Emission levels will comply with the requirements of the Industrial Emissions Directive and associated Large Combustion Plant BREF. These requirements are expected to be included within the IE Licence.

Combustion air is drawn through air filters and into the compressor where it is compressed and delivered to the combustion chamber. In the event of over pressurisation of the air in the compressors, the air will vent safely to atmosphere via a dedicated relief vent circa 15m high. The compressed air is mixed with a controlled amount of fuel and is then heated to a high temperature by the direct combustion of the fuel. The heat produced causes an expansion of the gases. These exhaust gases are expanded back to atmospheric pressure across the gas turbine producing motive power. A part of the power output is used to drive the compressors, and the excess of power is used to drive the electrical generator which produces electricity. The exhaust gases from the gas turbine will be at a high temperature of circa 450°C, and will be discharged to atmosphere through 3 no. 25m high stacks.

2.3 Civil Design

2.3.1 Storm Water Drainage System

The drainage and paving design has been developed to ensure no uncontrolled emissions to groundwater. Storm water will be discharged from the site at two outfall points – one at the eastern boundary toward the north of the site and one at the eastern boundary in the middle of the site. A

hydrobrake will be utilised for each of these outfalls points to limit the discharge to the existing drainage ditches to 1.4 l/s and 5.8 l/s respectively in line with greenfield run-off rates (see drawing no. 60695232-PTN-DR-020 and Aecom Drainage Engineering Report being submitted with this application).

All storm water runoff from hard-standing areas with the potential to become contaminated e.g. HVO tanks, offloading bays, transformer bays, etc. will pass through a full retention oil separator. There will be seven full retention separators on site. There will be one full retention separator to contain oil spills or leaks in each of the following areas; 1 no. adjacent to the HVO unloading area, 1 no. adjacent to the transformers, 1 no. adjacent to the car park area, and 1 no. smaller separator adjacent to the OCGT unit(s). The size of these interceptors will be finalised during the detailed design of the plant, however likely sizes are included within the drainage layout plan, drawing no. 60695232-PTN-DR-020.

These separators will retain any hydrocarbons present in the storm water (e.g. as a result of spills or leaks). The separators will be inspected regularly and if required the collected oil/water mixture will be pumped out by an appropriately licensed waste contractor and taken offsite for recovery at an appropriately licensed waste facility.

The separator at the fuel unloading area will be sized to contain the full contents of a tanker cell should it rupture, resulting in an oil spill. The gradients of the pavements in the fuel unloading area will fall towards a channel drain, which will then be directed into the separator.

The separators will be installed with an automatic closure device which will prevent flow passing through the separator when the quantity of oil in the separator exceeds the oil storage volume. The separator will also feature an automatic warning device to provide a visual and audible warning when the level of oil reaches 90 per cent of the oil storage volume under static liquid level conditions.

2.3.2 Waste Water

Process waste water will be produced from the on-site water treatment plant with the maximum volume being c. 73m^3 per day (to be confirmed at detailed design). This will be stored on site in a 450m^3 wastewater tank pending collection as required by an appropriately licenced waste collector for treatment offsite. There will also be waste oily water from floor drains from within the OCGT unit or units and generators, as well as drains from enclosed equipment such as the fuel filter skids, fuel skid modules, hydraulic starter units, lubricating tanks etc. which is collected through a separate drainage infrastructure, to the Fuel, Oil and Water Holding Tank. A maximum of 3 tankers per day will be required to remove the process waste water generated at the site.

The foul waste water from the Services Building will be stored in a separate 79m^3 tank in order not to mix the foul waste water with the process waste water. With 1m^3 of waste being produced each day it is estimated a maximum of 1 tanker per month should be adequate to remove the foul waste water from the site.

All underground waste water storage tanks will be supplied by a specialist manufacturer and installed with a concrete surround to the manufacturer's specification. The waste will be transported by a specialist waste contractor to a suitable licensed waste facility.

2.3.3 Potable Water Supply

The principal water usage requirements of the OCGT Generating Plant can be summarised as follows:

- Potable water ca. 1 m^3/day used for domestic purposes (drinking water, toilets etc.)
- Water for injection to control NO_x formation during the combustion process. The volume of water required to control NO_x formation is dependent on the operational hours of the plant.
- Water for fire-fighting purposes

The cooling system employed for the OCGT Generating Plant units is an air cooled system. This reduces the water requirement for the site and also the volume of wastewater to be discharged from the site.

The proposed development will include a connection to public water supplied by Irish Water. In December 2022, Irish Water confirmed that a connection to the existing water network for the site can be facilitated based on a maximum instantaneous flow of 3 l/s. This supply will cover the potable water requirement and the water treatment requirement for the site.

2.3.4 Firewater

Water for fire-fighting purposes will be stored in a firewater tank on site. In the event of a fire, firewater will be supplied to the fire main by firewater pumps located adjacent to fire water tank.

3 Planning History and Adjacent Projects

The site is situated in an industrialised area with a large cement plant and waste to energy facility.

As discussed in Section 1.1 of this report, SSE have been granted planning permission for the construction of a 110kV transmission sub-station strategic infrastructure development at Platin, Carranstown, Co. Meath by An Bord Pleanála in January 2020 (Case Reference PL17.303678).

Pending approval of the proposed OCGT Generation Plant by Meath County Council, the approved 110 kV Substation will be constructed in conjunction with the proposed OCGT Generating Plant construction. It is anticipated works on both the Substation and OCGT Generating Plant will commence in Q4 2023.

The recent planning history in the locality of Platin over previous five years is listed below in table 3.1 and is provided for cumulative assessment.

Table 3.1: *Recent planning history in the locality of proposed development*

Reg. ref	Applicant	Development Summary	Decision
ABP Case Reference PL17.303678	SSE	Construction of a 110kV transmission sub-station strategic infrastructure development at Platin, Carranstown, Co. Meath	SID. Granted by An Bord Pleanála in January 2020. This approved 110kV sub-station will be constructed in tandem with the proposed development upon grant of planning. An EIAR was not required for this development.
MCC Reference LB19003, ABP Case Reference PL17.305028	SSE	Construction of a distillate oil fired 208MW (electrical output) Open Cycle Gas Turbine (OCGT) Power Plant.	The decision taken by Meath County Council to grant permission in July 2019 for the development was appealed to An Bord Pleanála. Refused by An Bord Pleanála in December 2019 on the basis of fuel selection. An EIAR was not required for this development.
ABP Case Reference PL17.PA0050	Irish Cement	10 year permission to facilitate further replacement of fossil fuels with alternative fuels and allow for the introduction of alternative raw materials in the manufacturing of cement	Granted by An Bord Pleanála in April 2018. They are not considered to have a cumulative negative impact with the proposed development as they relate to improvement in air emissions in the locality.
MCC Case Reference FS16071, FS16072,	Indaver	Alterations to waste-to-energy facility.	Granted by Meath County Council in April and June 2018.

Reg. ref	Applicant	Development Summary	Decision
FS18022			They are not considered to have a cumulative negative impact with the proposed development as they relate to minor changes to existing operations.
ABP Case Reference PA17.307433	Indaver	Increase in annual total waste for treatment from currently permitted 235,000 tonnes to 250,000 tonnes, increase in annual amount of hazardous waste from currently permitted 10,000 tonnes to 25,000 tonnes, development of a aqueous waste tank farm, hydrogen generation unit, bottom ash storage building, development of a single storage warehouse, new concrete yard, weather canopy, demolition and rebuilding of an existing single storey modular office and ancillary site works.	Granted by An Bord Pleanála in March 2022. There will be a slight minor negative cumulative impact as there will be increased traffic on the R152, which the proposed development also utilises for construction and operational traffic.
MCC Case Reference LB171311	Paul Kavanagh Test Centre Ltd	The development will consist of the following: Building 1: Retention permission for a 1m wide external corridor to rear elevation, 4no. Exit doors and a 2.4sqm porch to the front of building together with permission for minor alterations to rear elevation. Building 2; Retention permission for extension of motor factors building including for tyre store and fitting area. Total floor area to be retained = 399sqm. Together with permission for alterations to front elevation, consisting of the provision of a new exit door. Building 3; Retention of new storage & workshop building. Total area to be retained 315sqm. Retention permission is also being sought for an extension to the existing car parking area together with permission for alterations to	Granted by Meath County Council in January 2018 They are not considered to have a cumulative negative impact with the proposed development as they relate to minor changes to an existing facility.

Reg. ref	Applicant	Development Summary	Decision
		the internal site traffic management arrangements as well as the traffic management arrangements to the R152 boundary	
MCC Case Reference LB160898, ABP Case Reference PL17248146	Highfield Solar Limited	for permission to build a solar farm on a site which was split into two sites to the northeast and southwest of the Downestown Road at Garballagh, Thomastown, Gillinstown and Downestown, Duleek, Co. Meath.	The decision taken by Meath County Council to grant permission for the development was appealed to An Bord Pleanála. In January 2019, ABP ultimately made a split decision, granting permission for the larger western solar array in the townlands of Garballagh, Thomastown and Gillinstown, and refusing permission for the smaller eastern solar array in the townland of Downestown. The 110kV substation and associated infrastructure required for Site 1 was omitted from the planning permission. This is considered not to have a cumulative impact on the proposed development on the basis of distance from the proposed development site.
ABP Case Reference PL17.306330	Highfield Solar Limited	to consider if their proposal to construct a 110 kV substation Garballagh and Commons, Duleek would fall within the scope of section 182A of the Planning and Development Act 2000, as amended (strategic development infrastructure).	The Board issued a decision in April stated that this development does fall under the scope of section 182A of the Planning and Development Act 2000, as amended. The proposed sub-station will be connected directly to the Drybridge-Baltrasna 110kV line by way of a looped in/out connection, and therefore will have no impact/connection to the proposed OCGT Generating Plant or approved 110kV Substation at the SSE site.

Reg. ref	Applicant	Development Summary	Decision
MCC Case Reference LB200487	Highfield Solar Limited	a 10 year permission for the construction of a solar PV Energy development within a total site area of up to 81.3hA, to include solar PV panels ground mounted on steel support structures, electrical transformer/inverter station modules, battery storage modules, storage containers, CCTV cameras, access tracks, fencing and associated electrical cabling, ducting and ancillary infrastructure.	Granted by Meath County Council in February 2021. The proposed development connects directly to the Drybridge-Baltrasna 110kV line by way of a looped in/out connection, and therefore will have no impact/connection to the proposed OCGT Generating Plant or approved 110kV Substation at the SSE site
MCC Case Reference 22262	Highfield Solar Limited	Council to amend the lifetime of the approved development (Planning ref: LB/160898) which comprises consent for the development of a solar farm on a site of approximately 131.37 hectares at Garballagh, Thomastown, Gillinstown, Duleek, Co Meath. Permission was sought to amend the operational lifespan of the consented development from 25 years to 35 years.	Granted by Meath County Council in April 2022. They are not considered to have a cumulative negative impact with the proposed development as they relate to minor changes to existing operations.
MCC Case Reference 22972	Highfield Solar Limited	The development will consist of a 10-year permission for the construction of a solar PV energy development within a total site area of approximately 18.92ha, include solar PV panels ground mounted on steel support structures, IPP electrical control building and associated compound, electrical transformer/inverter station modules, battery storage modules, storage containers, CCTV cameras, access tracks, fencing and associated electrical cabling, ducting and ancillary infrastructure.	Granted by Meath County Council in May 2023. The proposed development connects directly to the Drybridge-Baltrasna 110kV line by way of a looped in/out connection, and therefore will have no impact/connection to the proposed OCGT Generating Plant or approved 110kV Substation at the SSE site
MCC Case Reference	Paul Kavanagh	For a development comprising: (i) part-	Granted by Meath County

Reg. ref	Applicant	Development Summary	Decision
LB201717	Test Centre Ltd	demolition (totalling 390sq.m) of existing 972.5 sq.m Test Centre; (ii) construction of 1 no. single storey building (totaling 639sq.m) comprising of a new testing area with ancillary staff and customer facilities; (iii) provision of 24 no. new car parking spaces, 5 no. LCV parking spaces and 5 no. HGV parking spaces; and (iv) all ancillary works necessary to facilitate the development including drainage and site works.	Council in June 2021. They are not considered to have a cumulative negative impact with the proposed development as they relate to minor changes to an existing facility.
MCC Case Reference LB201629, ABP Case Reference PL17.309308	Irish Cement	20 year permission for a 13.5 hectare extension to existing Overburden Management Facility The application is accompanied by an Environmental Impact Assessment Report (EIAR). The application requires an Industrial Emissions Directive (IED) Licence and the facility operates pursuant to an existing IED Licence (EPA Ref No. P0030-05.	Granted by An Bord Pleanála in July 2021. They are not considered to have a cumulative negative impact with the proposed development as they relate to minor changes to existing operations.
MCC Case Reference LB201519	Keegan Quarries Ltd	The continuation of the use and further quarrying of limestone within the 57.5Ha site, granted by Substitute consent (PL17.su0088), comprising extraction from a 20.6Ha area which includes a lateral extension of 6.2Ha, using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening to a depth of 30mAOD. The development includes some 3.4Ha of advanced woodland planting, new administration office and workshop, associated septic tank with raised sand polishing filter and an oil interceptor with soak-away trench. A weighbridge with an associated dispatch office	Granted by Meath County Council in June 2021. They are not considered to have a cumulative negative impact with the proposed development as they relate to a facility located 2.2km from the site.

Reg. ref	Applicant	Development Summary	Decision
		and ancillary structures to include a wheelwash and the potential in line relocation of 110kv transmission poles and the reuse of the northern void 3.24Ha at a reprofiled level of some 40mAOD using on site overburden to provide for a new low level location for a replacement concrete batching plant for the existing plant (01/4203) and a concrete block making yard with restoration of the lands to biodiverse habitats upon completion of extraction. The application is accompanied by an Environmental Impact Asssessment Report and a Natura Impact Statement.	
MCC Case Reference 212417	Irish Cement	Permission for extension of 811.50sqm gross floor area to an existing bulk materials storage shed and ancillary site works. The maximum height of the extension will be circa 14m, which is the same height as the existing building. The 1,868sqm development is located within the existing Cement Works at Platin, County Meath. The application relates to Platin Cement Works, which is subject to an Industrial Emissions License (IE License No. P0030-60).	Granted by Meath County Council in February 2022. They are not considered to have a cumulative negative impact with the proposed development as they relate to minor changes to an existing facility.
MCC Case Reference 22480	Boann Distillery Limited	Construction of a whiskey maturation warehouse facility. The proposed development includes the construction of 1 no. warehouse building of c. 3246 sq.m for whiskey maturation and a machinery shed with solar photovoltaic (PV) panels on both buildings. The development also fire water retention pond, sewerage treatment unit and associated infrastructure, a new	Granted by Meath County Council in September 2022. They are not considered to have a cumulative negative impact with the proposed development beyond a slight increase in traffic volume on R152.

Reg. ref	Applicant	Development Summary	Decision
		vehicular access to the Platin Road (R152), car parking, hard and soft landscaping and all associated site development works.	
MCC Case Reference 21663, ABP Case Reference PL17.310729	Tunis Properties LLC	The proposed development consists of the following: construction of a two storey (with mezzanine levels at both storeys) data storage facility building with a maximum overall height of c. 25 metres, containing data halls, associated electrical and mechanical Plant Rooms, a loading bay, maintenance and storage space, office administration areas, screened plant and solar panels at roof level, all within a building with a total gross floor area (FGA) of c. 28,566 sq.m.	Granted by An Bord Pleanála in April 2022. The data centre is 3.3km from the proposed OCGT Generating Plant or approved 110kV Substation at the SSE site. They are not considered to have a cumulative impact on the site on the basis of distance.
MCC Case Reference 221718	Eirgrid	An uprate of the existing Drybridge to Platin 110 kV Overhead line (OHL) {approximately 5.6 km long and comprising 33no. structures (excluding LCIM 13a and LCIM 14 which are consented under separate planning application) and 2no. gantries between the existing Drybridge 110 kV substation in the townland of Tullyallen, Co. Louth and the existing Platin 110kV substation in the townland of Platin, Co. Meath	Granted by Meath County Council in February 2023. The proposed development will not negatively impact on the existing Platin 110kV substation, and therefore will have no impact/connection to the proposed OCGT Generating Plant or approved 110kV Substation at the SSE site.
MCC Case Reference 23458	Eirgrid	An uprate of the existing Gorman to Platin 110 kV Overhead line (OHL) (19.76 km long and comprising 109no. supporting structures between the existing Gorman substation in the townland of Causetown, Co. Meath and the existing Platin 110kV substation in the townland of	Decision pending by Meath County Council If approved, the proposed development will not negatively impact on the existing Platin 110kV substation, and therefore will have no impact/connection to the proposed OCGT

Reg. ref	Applicant	Development Summary	Decision
		Platin, Co. Meath	Generating Plant or approved 110kV Substation at the SSE site.

4 Legislative Context

Directive 2011/92/EU of The European Parliament and of The Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU of the European Parliament and of The Council of 16 April 2014, (the EIA Directive) provides that projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location must be made subject to a requirement for development consent and an assessment with regard to their effects on the environment. Ireland has implemented the EIA Directive under, inter alia, the Planning and Development Acts 2000 as amended, in particular Part X thereof and also under the Planning and Development Regulations 2001 –(as amended) (the Planning and Development Regulations).

EIA Screening determines whether an EIA is required for a specified project. Projects requiring mandatory EIA are listed in Part 1 of Schedule 5 of the Planning and Development Regulations. In the case of developments which are below the thresholds of the listed projects, planning authorities are required under Article 103 of the Planning and Development Regulations (as amended), to request an EIAR where it considers that there is a real likelihood the proposed development will have a significant effect on the environment.

4.1 Mandatory EIA

The classes of development which require a mandatory EIA are defined in Article 93 and Schedule 5 (Part 1 and Part 2) of the Planning and Development Regulations as derived from the EIA Directive Annex I and Annex II. Part 1 of Schedule 5 defines those projects where it is mandatory for an EIAR to be prepared. Part 2 defines projects that are assessed on the basis of mandatory thresholds for each of the development classes.

The proposed development has been reviewed against the Schedule 5 development classes. See Section 4 of this report.

4.2 Sub-Threshold Development

Where a development proposal is not of a class of development in Part 1 of Schedule 5 and is below the mandatory threshold for its particular project class set out in Part 2 of the Schedule, it is considered to be ‘sub-threshold’ development. Such development may require an EIA if there is potential for significant environmental effects arising from the construction and/or operation of the development.

In the case of sub-threshold development, the requirement for EIA is determined on a project specific basis in accordance with certain criteria. The guiding principle laid down by Article 2 of the EIA Directive (2011/92/EU) is that *projects “likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location”,* should be subject to EIA.

Schedule 6 of the Planning and Development Regulations, 2001 (as amended), outlines the aspects of the environment likely to be significantly affected by a proposed development.

These are: human beings, biodiversity (flora and fauna), land, soil and geology, water, air and climate, landscape, material assets, cultural heritage and the inter-relationships between the range of environmental criteria. EIA screening involves assessment of these criteria to determine if the proposed development is likely to significantly affect the environment.

Section 4 of this report is written in accordance with guidelines provided in:

- Guidelines on the information to be contained in Environmental Impact Assessment Reports, (EPA, 2022)
- EIA, Guidance for Consent Authorities Regarding Sub-Threshold Development, (DoEHLG, 2003)
- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning & EPA Licencing System, Department of Housing, Planning, Community and Local Government, May 2017, which focuses on changes required in the planning code (Planning and Development Act

2000, as amended, and the Planning and Development Regulations 2001, as amended, as a result of the 2014 EIA Directive

- Circular letter PL 1/2017 - Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive), Department of Housing, Planning, Community and Local Government, May 2017

4.3 Circular Letter – Implementation of EIA Directive

In May 2017 the Department of Housing, Planning, Community and Local Government issued a circular letter PL 1/2017 to all the relevant planning authorities regarding Ireland's implementation of EIA Directive 2014/52/EU. It included information on procedures to be followed in the case of planning applications issued made after 16 May 2017. In relation to EIA screening the following is noted and has been taken into consideration in this report:

20. Where a developer makes a screening determination request, he or she must provide the Competent Authority with the information listed in Annex IIA (new to the 2014 Directive).

21. A screening determination must be based on the information provided by the developer.

22. The reasons for the determination must be given with reference to the criteria set out in Annex III (amended from the 2011 Directive).

23. If mitigation measures are influential to a screening determination, these must be stated by the Competent Authority in the screening determination.

24. A screening determination must be given within a period not exceeding 90 days from the date the developer submits the required information, except in exceptional cases where the period may be extended.

25. Screening relates only to Annex II projects where significant effects on the environment cannot be discounted.

4.4 Licensable Activities – Land-use Consent & Licensing

Section 173A (5) of the Planning and Development Acts 2000 to 2014 states:

> *"Where a planning authority or the Board is considering an application for permission in respect of development—*
>
> *(a) of a class prescribed by regulations under section 176 that does not exceed a quantity, area or limit prescribed under those regulations,*
>
> *(b) in respect of which the planning authority or the Board is obliged under this Act to make a determination whether an environmental impact assessment is required, and*
>
> *(c) in respect of which application for permission the planning authority or the Board consider an integrated pollution prevention and control licence under Part IV of the Act of 1992 is required,*
>
> *the planning authority or the Board shall request observations from the Agency to assist the planning authority or the Board in its deliberations in relation to the determination referred to in paragraph (b) and shall take into account any such observations when making that determination."*

As described in Section 1.2, the proposed development will require an IE licence. An IE licence application for the operation of the OCGT Generating Plant will be submitted to the EPA following submission of the planning application.

5 Screening Assessment

5.1 Mandatory EIA (Schedule 5 – Part 1 Development)

The classes of development which require a mandatory EIA are defined in Article 93 and Schedule 5 (Part 1 and Part 2) of the Planning and Development Regulations 2001 as amended.

Part 1 of Schedule 5 defines 24 classes of development projects where it is mandatory for an EIAR to be prepared if either:

(i) such development would equal or exceed, as the case may be, any relevant quantity, area or other limit specified in that Part, or

(ii) no quantity, area or other limit is specified in that Part in respect of the development concerned.

The proposed development has been fully assessed for compatibility with the development classes of Part 1, see Appendix A for details.

It is clear the proposed development is not within the majority of defined development classes (e.g. nuclear facilities, transport infrastructure, agricultural facilities, quarries etc.). For clarity, further detail is included below on the distinction between the proposed development and those installations identified for EIA within Part 1 of Schedule 5.

5.1.1 Class 2 (a)

> *2 (a). A thermal power station or other combustion installation with a heat output of 300 megawatts or more.*

Not applicable. The proposed development is a HVO fired OCGT Generating Plant of up to 170MW (electrical output). The facility's primary output is electrical energy. The proposed development has an heat output of 269MWt. The only thermal output associated with the facility would be waste heat from the stacks of the OCGT units, but this output will be well below the 300MW (thermal output) threshold. The technology involved is Open Cycle Gas Turbine technology. The plant will be designed for largely automatic control from a central control room (CCR), with the majority of plant functions being initiated and monitored from the CCR. The operating characteristics of the plant are inherently flexible, and the control system will provide for flexible operation.

5.1.2 Class 20

> *20. Construction of overhead electrical power lines with a voltage of 220 kilovolts or more and a length of more than 15 kilometres.*

Not applicable. The proposed development does not require the construction of overhead electrical power lines. A 110kV line runs across the site and is readily available for connecting the proposed development. The ESB will undertake any grid connection works under its statutory remit.

5.2 Sub-Threshold EIA (Schedule 5 – Part 2 Development)

Part 2 defines projects that are assessed on the basis of mandatory thresholds for each of the development classes. The proposed development has been fully assessed for compatibility with the development thresholds of Part 2. See Appendix B for further details.

The proposed development does not exceed the defined thresholds listed in Part 2 of Schedule 5 (e.g. agriculture, extractive industry, mineral industry etc.).

For clarity, further detail is included in Sections 4.2.1 to 4.2.8 on the distinction between the proposed development and

a) Energy Industry (Part 2 Class 3);

b) Infrastructure Projects (Part 2 Class 10);

c) Part 2 type development which is sub-threshold (Part 2 Class 15).

5.2.1 Class 1(b)

> *1(b) Projects for the restructuring of rural land holdings, undertaken as part of a wider proposed development, and not as an agricultural activity that must comply with the European Communities (Environmental Impact Assessment) (Agriculture) Regulations 2011, where the length of field boundary to be removed is above 4 kilometres, or where re-contouring is above 5 hectares, or where the area of lands to be restructured by removal of field boundaries is above 50 hectares.*

The proposed development will not remove any field boundaries. The proposed development re-contouring of the land amounts to 4.2 hectares in total and is below the threshold of 5 hectares. There will be no restructuring by removal of field boundaries during the proposed development.

5.2.2 Class 3(a)

> *3(a) Industrial installations for the production of electricity, steam and hot water not included in Part 1 of this Schedule with a heat output of 300 megawatts or more.*

The plant consists of a Power Generation Plant of up to 170MW (electrical output). The proposed development will generate less than 300 MWt (heat output) as it is rated at 269 MWt and thus is below this threshold limit.

5.2.3 Class 3(b)

> *3(b) Industrial installations for carrying gas, steam and hot water with a potential heat output of 300 megawatts or more, or transmission of electrical energy by overhead cables not included in Part 1 of this Schedule, where the voltage would be 200 kilovolts or more*

The proposed development is an OCGT Generating Plant of up to 170MW (electrical output) and does not fall under the activity class described in Class 3(b). Generators are driven by open cycle gas turbine to produce electricity. The plant will produce c. 170MW of electricity. The proposed development generates less than 300 MWt (heat output) as it is rated at 269 MWt which is below the class 3(b) threshold limit. The electrical output will be transmitted via the existing 110 kilovolt system. No new overhead cables will be installed as part of the proposed development and the voltage of all cables associated with the proposed development will be 110kV.

5.2.4 Class 10(b)(iv)

> *10(b)(iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere*

Not applicable. The overall proposed development site is 10.55 hectares in area. The area which the proposed development will be located does not fall within a “built-up” area or a ‘business district’ (it is some distance outside the outskirts of Duleek town) as included by the Planning Development Regulations; therefore the appropriate threshold for this class is 20 hectares. As the proposed development area is substantially less than this threshold, this class does not require a mandatory EIA for the proposed development.

5.2.5 Class 15

> *15. Any project listed in this Part which does not exceed a quantity, area or other limit specified in this Part in respect of the relevant class of development but which would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7.*

As described in Section 1.3, the proposed development has been assessed against the criteria for sub-threshold EIA, i.e. the criteria set out in Schedule 7 of the Planning and Development Regulations. Further to this assessment, it is concluded the proposed project is unlikely to have significant effects on the environment and therefore does not meet the description of Class 15.

5.3 Assessment of Environmental Significance

As described in previous sections, the nature and extent of the proposed development is such that it does not fall within in a class of development in either Part 1 or Part 2 of Schedule 5 and would equal or exceed any relevant threshold where there is a mandatory requirement for EIA to be carried out. The requirement for the proposed development to be assessed as a sub-threshold development is considered in this section.

The criteria used to decide whether or not a development is likely to have a "significant effect on the environment" was first introduced by the 1997 amending Directive (97/11/EC), and was transposed in full into Irish legislation in the Third Schedule to the European Communities Environmental Impact Assessment (Amendment) Regulations 1999, (S.I. no. 93 of 1999) and are recorded in Schedule 7 of the Planning & Development Regulations. It is noted that an amending EU Directive (2014/52/EU)[4] was introduced in May 2014 and transposed into Irish legislation under European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. no. 296 of 2018). The amending Directive updates the Annex III criteria. The criteria considered for the purposes of this report are those currently contained in Schedule 7 of the Planning & Development Regulations and Annex IIA and III of the EIA Directive 2014/52/EU.

The criteria are grouped under three headings as follows:

- Characteristics of the proposed development;
- Location of proposed development;
- Type and Characteristics of potential impacts.

These main criteria are shown in the following tables (Tables 5.1 – 5.3) and are used to inform in this screening assessment to determine whether the development is likely to have a significant effect on the environment. Further cumulative assessment is detailed in the Environmental Report which has been submitted as part of this application.

Table 5.1: *Characteristics of the Proposed Development*

Characteristic	Response
The size and design of the whole proposed development	The development consists of a hydrotreated vegetable oil (HVO) fired OCGT Generating Plant of 170 MW (electrical output), with a heat output equivalent of 269MWt. The plant will consist of 3 no. OCGT units. It will be used as a backup peaking plant, to run at times of high electricity demand, and will be run in open cycle mode. The plant will only run up to 1,800 hours, per year, with higher operating times during winter months and lower operating times in summer months. The site is c. 10.55 hectares, with a maximum stack height of 25m. A full description of the proposed development is included in Section 2 of this EIA Screening Report.

[4] Directive 2014/52/EU of the European Parliament and of 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

Characteristic	Response
Potential for cumulative impacts with other existing and/or approved projects?	The potential for cumulative impacts of the proposed development with other planned developments and industrial facilities in the vicinity of the proposed site location is addressed throughout the Environmental Report accompanying this planning application where relevant. As discussed in Section 1.1 of this report, SSE have been granted planning permission for the construction of a 110kV Substation strategic infrastructure development at Platin, Carranstown, Co. Meath by An Bord Pleanála in January 2020 (Case Reference PL17 .303678). Pending approval of the proposed OCGT Generating Plant by Meath County Council, the approved 110 kV Substation will be constructed in conjunction with the OCGT Generating Plant construction. A Construction Environmental Management Plan (CEMP) will be prepared for the proposed development of the OCGT Generating Plant and this will align with the CEMP and Traffic Management Plan which is to be submitted to and agreed with Meath County Council for the approved 110KV Substation. Subject to grant of planning permission, it is anticipated works on both the 110kV Substation and OCGT Generating Plant will commence in Q4 2023 with first operation of the plant in Q3 2026. The mitigation measures identified in the Environmental Report, the Natura Impact Statement (which covers both approved 110kV substation and proposed development as they will be constructed in tandem) and the Planning Conditions associated with both developments will be implemented in full during the construction phase of these projects. The proposed development will not have a cumulative impact with other industries adjacent to the site (Irish Cement, Indaver, Paul Kavanagh Test Centre Ltd, Boann Distillery, Highfield Solar Limited and Eirgrid). These facilities have planning applications either approved or currently in the planning approval process; however the scale of these planning applications are considered minor as they are on existing industrial sites some distance away from the proposed development and consist only of alterations or modifications to structures. They are not considered to have a cumulative negative impact with the proposed development as they relate to existing operations. The surrounding area is established with industrial facilities. <u>Consideration of the Proposed Leinster Orbital Route</u> Although the Leinster Orbital Route is referred to in the Meath County Development Plan 2021 -2027, the Regional Spatial and Economic Strategy for the Eastern and Midlands Region (RSES), and the National Transport Authority's' (NTA) Transport Strategy for the Greater Dublin Area (2016-2035), it is not accounted for in the National Planning Framework (NPF) (Project Ireland 2040) which sets out the strategic plan for leading future growth and development of Ireland up to 2040. Furthermore, the Orbital route is also not included as part of the National Development Plan (2018-2027) which outlines investment priorities that support the implementation of infrastructural objectives in the NPF. The RSES indicates that long term protection shall remain for the outer orbital route (Leinster Outer Orbital Route) extending from Drogheda to the Naas/Newbridge area with intermediate links to Navan and other towns. The NTA Strategy for the GDA 2016 -2035 notes that while this project is not planned for implementation during the period of the Strategy, the finalisation of the route corridor and its protection from development intrusion is recommended. MOV POL 23 of the Meath County Development Plan states it is the policy of the Council to support the delivery of the Leinster Orbital Route, which is

Characteristic	Response
	considered to comprise important infrastructural development, and when finalised, to protect the route corridor free of developments which could interfere with the provision of the project. MOV POL 37 of the Meath County Development Plan states it is the objective of the Council when finalised and agreed, to reserve the route corridor of the Leinster Orbital Route free of developments which could otherwise interfere with the provision of the project. SSE understand the requirement for such route corridors in facilitating road development; however, given the urgent need and importance of the proposed development to support and reinforce the supply of electricity to the grid network in the wider area, such indicative routes should not prohibit other necessary and strategic infrastructure development from occurring.. The Leinster Orbital Route is not provided for within the government's leading strategic planning document (the NPF), nor provided for in the investment priorities set out in the National Development Plan. The route set out is also an indicative route corridor which is not finalised and may be subject to change. MOV POL 37 as stated above states it is the objective to keep the route corridor free of developments when finalised, however the route has not yet been determined and may not be determined for quite some time. As noted in the ABP Inspector's Report (303/R303678) for the 110kV substation, the inspector stated it was not grounds for refusal due to the uncertainty of the orbital route and ultimately planning permission was granted by ABP. As the Leinster Orbital Route corridor has not yet been finalised, it is not possible to determine the effect of the proposed development on the Leinster Orbital Route.
Use of natural resources, in particular land, soil, water and biodiversity	There is no evidence to suggest that the proposed development will have a detrimental impact on the natural resources in the area. It is located on a ca. 10.55 ha greenfield site beside existing industrial facilities and thus will form part of a cluster of similar activities within the landscape in an area. The clustering of existing and permitted industrial and energy related infrastructure projects at this location is cited as an example which can be replicated at other locations in the Meath County Development Plan 2021-2027 (see section 4.3.1 Regional Spatial and Economic Strategy 2019-2031 of the Meath County Development Plan 2021 - 2027). – A Construction Environmental Management Plan (CEMP) will be implemented during construction works. The following key topics will be addressed including; Traffic Management, Construction Safety Arrangements, Construction Environmental Management Planning, Storm Water Run-off Management Planning, Waste Management Planning, Construction Execution Strategy and Plan and Construction Completion & Turnover Plan. – The proposed development is located within a greenfield area previously used for intensive tillage. The use of the land for the proposed development (10.55 ha) is not considered significant in the wider area. There will be a loss of 10.55 ha of agricultural land and this, in the context of overall national availability, is not considered significant. – Construction works are expected to commence on site in Q4 2023 (subject to receipt of planning permission) with a total duration of 30 months. There will be no significant use of fuel / energy resources by construction vehicles and equipment. – Topsoil that is stripped off during construction will be used in landscaping on the site and creating berms/terraces. The construction phase will not result in the excavation or removal of

Characteristic	Response
	any bedrock from the development site. Therefore the construction phase of the development is not predicted to have any significant adverse impact on the geology, soils and hydrogeology (groundwater) of the site. – In terms of biodiversity of the site, the existing use is monoculture (barley production), there is no proposed removal of hedgerow etc. and no watercourses exist in the development area. – During periods of wet weather, rainwater runoff from the lands would enter a drainage channel that combines with other ditches from surrounding lands and migrates to the River Nanny. A description of the storm water drainage design is provided in Section 2.4.1 of this report. All storm water will pass through full retention separators onsite for reuse and discharge. It is predicted that the discharge will not result in the deterioration of the status under the Water Framework Directive (WFD) of any water body and will not jeopardise any such water body achieving good status under the WFD. – A Screening for Appropriate Assessment has been completed in accordance with the requirements of the Habitats Directive (92/43/EC as amended) to determine the potential adverse impact of the proposed development on the integrity of Natura 2000 sites. A Natura Impact Statement (NIS) is included in the planning application. – NIS Conclusion: This NIS has examined and analysed, in light of the best scientific knowledge, with respect to those European sites within the zone of influence of the proposed development, the potential impact sources and pathways, the manner in which these could potentially impact on the European sites' QIs/SCOs and whether the predicted impacts would adversely affect the integrity of the following European Sites that were screened in for Stage 2 assessment: **River Boyne and River Blackwater SAC, River Boyne and River Blackwater SPA, Boyne Coast and Estuary SAC, Boyne Estuary SPA, River Nanny Estuary and Shore SPA**. There are no other European sites at risk of effects from the proposed development. Avoidance, design requirements and mitigation measures are set out within this NIS (and its appendices) and the effective implementation of these mitigation measures will ensure that any impacts on the conservation objectives of European sites will be avoided during the construction, operation and decommissioning phases of the proposed development such that there will be no adverse effects on any European sites. It has been objectively concluded by Scott Cawley Ltd., following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted impacts from the proposed development and the effective implementation of the mitigation measures prescribed, that the proposed development will not adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects. There will be limited use of natural resources during the construction and operational phases of the proposed development.
The production of waste	The main source of waste associated with the proposed development will be during the construction and this is thought to be relatively small overall. Based on the non-hazardous nature and relatively limited quantity of

Characteristic	Response
	building materials, the proposed development will not result in significant quantities of waste compared to typical construction projects of industrial scale. The construction involves the installation of equipment, tanks and modular control facilities on pre-constructed hard standing surfaces. All waste streams will be suitably controlled and managed through the implementation of a Resource and Waste Management Plan (RWMP) During operation, the proposed development will not generate significant quantities of waste as there are very few process wastes associated with the operation of the power plant. The principal types of waste generated by the plant will include waste from periodic plant maintenance and cleaning activities, used packaging/containers, general office/domestic waste, landscaping waste etc. There is adequate capacity in existing off-site waste disposal and treatment facilities to accommodate the quantity of waste generated by the OCGT Generating Plant. The maximum volume of wastewater to be produced in any one day will be c. of 67m, (to be confirmed at detailed design). This will be stored on site in a 90m^3 wastewater tank pending collection as required by an appropriately licenced waste collector for treatment offsite. During the operational phase all waste will be handled in accordance with the site IE licence as granted by the EPA and the site's Environmental Management System. The IE licence will govern the environmental management of the OCGT Generating Plant and ensure the operation of the plant and associated environmental emissions do not have any significant adverse impact on the environment. All applicable Best Available Techniques Reference (BREF) Documents as set out by the European Commission will be assessed during the licence application to ensure full compliance to best practice guidance. Further to the implementation of a RWMP during the construction phase and adherence to the site IE licence during the operation phase, no significant environmental effects are considered likely in terms of waste generation.
Pollution and nuisances	**Pollution** All emissions from the operation of the OCGT Generating Plant will be regulated under the conditions of an IE licence. All site emissions will be monitored in accordance with this IE licence requirements and the monitoring results will be reported annually to the EPA. Summaries of these results are made available publicly via the EPA website through the Annual Environmental Reporting (AER) system. The IE licence will govern the environmental management of the OCGT Generating Plant and ensure the operation of the plant and associated environmental emissions do not have any significant adverse impact on the environment. All applicable Best Available Techniques Reference (BREF) Documents as set out by the European Commission will be assessed during the licence application to ensure full compliance to best practice guidance. Emission levels should comply with the requirements of the Industrial Emissions Directive and associated Large Combustion Plant BREF. These requirements are expected to be included within the IE Licence. Air Emissions In the absence of adequate management and mitigation measures, construction activities will potentially result in a short term negative impact on ambient air quality due to the generation of dust and emissions from construction machinery. A number of mitigation measures will be in place to minimise any construction related emissions to air and thus prevent any significant impact on air quality. The mitigation measures are documented in the

Characteristic	Response
	Environmental report to be submitted with the planning application and will be included in the CEMP for the proposed development. There will be 3 no. main air emission points (1 no. from the exhaust stack of each of the OCGT Units) at the proposed development. An Air Dispersion Modelling Report is included with the Environmental report to assess the impact of the proposed development on local ambient air quality. It has demonstrated that there will be no significant impacts from the operation of the 3 no. OCGT units for up to 1800 hours per year using HVO. The Air Dispersion modelling report also demonstrates that there will be no significant impact on ambient air quality in the vicinity of the plant should the plant be required to operate using backup HVO for up to 1800 hours per year (highly unlikely). It has been demonstrated that the emissions to do not lead to exceedances of air quality standard limits. With respect to mitigation measures the OCGT plant will run for a maximum of 1800 hrs annually, the facility will be subject to IE licensing and the combustion process will be tightly monitored and controlled to ensure the facility runs as efficiently as possible. Emission levels should comply with the requirements of the Industrial Emissions Directive and associated Large Combustion Plant BREF. These requirements are expected to be included within the IE Licence. Storm Water/Surface Water In the absence of adequate management and mitigation measures the construction phase of the development could have an adverse impact on the surface water environment in the event of storm water runoff from the site becoming contaminated. A number of migration measures to be implemented during the construction phase have been outlined in the Environmental Report to be submitted with the planning application and these mitigation measures are included in the CEMP for the construction phase of the proposed development. This will prevent any significant adverse impact on surface waters. All storm water runoff from hard-standing areas with the potential to become contaminated e.g. HVO tanks, offloading bays, transformer bays, etc. will pass through a full retention oil separator. There will be seven full retention separators on site. There will be one full retention separator to contain oil spills or leaks in each of the following areas; 1 no. adjacent to the fuel unloading area, 1 no. adjacent to the transformers, 1 no. adjacent to the car park area, 1 adjacent to the AGI gas terminal and 1 no. smaller separator adjacent to each of the three OCGT units. These separators will retain any hydrocarbons present in the storm water (e.g. as a result of spills or leaks). The separator at the fuel unloading area will be sized to contain the full contents of a tanker cell should it rupture, resulting in an oil spill. The gradients of the pavements in the fuel unloading area will fall towards a channel drain, which will then be directed into the separator. The separators will be installed with an automatic closure device which will prevent flow passing through the separator when the quantity of oil in the separator exceeds the oil storage volume. The separator will also feature an automatic warning device to provide a visual and audible warning when the level of oil reaches 90 per cent of the oil storage volume under static liquid level conditions. Storm water will be discharged from the site at two outfall points – one at the eastern boundary toward the north of the site and one at the eastern boundary in the middle of the site. A hydrobrake will be utilised for each of these outfalls points to limit the discharge to the existing drainage ditches to 1.4 l/s and 5.8 l/s respectively in line with greenfield run-off rates (see drawing no. 60695232-PTN-DR-020 and Aecom Drainage Engineering

Characteristic	Response
	Report being submitted with this application). Process and Foul wastewater produced on site will be stored in wastewater storage tanks pending collection as required by an appropriately licenced waste collector for treatment offsite. **Nuisances** In the absence of adequate management and mitigation measures, construction works and industrial site operations have the potential to generate nuisance if not correctly managed. Environmental nuisances may include dust, odour, litter and birds, noise, traffic and vermin. A CMP will be prepared for the site detailing construction environmental management plan for the site. *Dust Control* – Construction activities on site, including excavation and earthmoving, could result in the generation of dust which adversely impact ambient air quality. Transportation of loose materials that are not properly contained on or off site could also result in dust generation as would the transfer of mud/soil from the wheels of construction traffic onto surrounding roads. Mitigation measures will be put in place including proper storage of spoil/loose materials, wheel washing of construction vehicles leaving the site, proper containment of loose materials that are transported on or off site and damping of site roads as necessary. Subject to the implementation of controls, no significant dust nuisance effects are considered likely. *Odour* – there are no nuisance odours associated with the construction works. All chemicals will be stored in bunded areas. There will be no sources of odour associated with the proposed development. *Litter & Birds* – Designated waste facilities will be provided on-site with covered receptacles for contractors in areas of construction works. *Noise* – Construction phase noise emissions will be primarily limited to vehicle movements and construction works (mobile generators, use of construction plant, equipment and power tools etc.). These noise emissions will be short term, temporary in nature and limited to daytime hours only. In summary, no significant effects are foreseen in terms of noise emissions as a result of the scope of construction works proposed. This is based on: – Limited scope involved in the construction, with construction over an 30 month period – Implementation of suitable good practice construction control measures including restriction of working hours to daytime only (with exception of concrete pour) and careful selection of plant and machinery to minimise noise effects It is expected that there will be no significant noise emissions during the operational phase of the proposed development. A detailed noise assessment has been carried out and is included in the Environmental Report being submitted with the planning application. Noise limits for day, evening and night time will be adhered to in accordance with pending site IE licence conditions and annual monitoring will be completed to demonstrate this as per EPA guidelines. Plant and equipment associated with the proposed development will be fitted with appropriate acoustic abatement as required. *Traffic* – an assessment of the potential traffic impact of the proposed OCGT Generating Plant development during both the construction and operational phases is included in the Environmental Report being submitted with the planning application. The peak on-site employment during the construction phase is expected to

Characteristic	Response
	be 40 to 60 persons. The potential impact will be short, with phased construction occurring over a 30 month period. There will also be a number of HGV deliveries to site during the construction phase (c. 21 HGV visits per day during peak construction) which will be spread out over the course of the day. Traffic in this phase will result in an increase of only 2.29% and 1.93% on existing traffic levels during morning and evening peaks respectively. During operation plant will run in automated control and will be minimally attended (up to 4 personnel). Site attendance will be limited to maintenance and occasional administrative meetings. There will also be HGVs visiting the plant regularly with deliveries of water treatment chemicals and backup HVO, and collections of foul and process waste water for treatment off-site. The numbers of these HGV visits to site will vary depending on the operational hours of the plant, but it is considered there will be a maximum of 13 no. HGV visits. During the operational phase, the increase over existing traffic levels will normally be only 1.43% and 1.2% during morning and evening peaks respectively. As the estimated amount of traffic to be generated during the construction and operational phases of the development will be less than 5% of the existing traffic levels; the proposed development does not trigger a requirement for further assessment in accordance with The Traffic and Transport Assessment Guidelines (NRA, 2014), and the impact on the surrounding road network is not considered significant.
The risk of major accidents and/or natural disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge	As part of the design for the proposed development Project Supervisors Design Phase (PSDPs) acting on behalf of SSE has issued an AF1 form to the Health & Safety Authority (HSA). The proposed construction works will be carried out following the approval of the HSA via an AF2 form. During construction the relevant project supervisor construction stage (PSCS) will be appointed. The proposed development will be classified as a 'Seveso' site for the Control of Major Accident Hazards (COMAH). The normal volume of backup HVO biofuel stored onsite in a bunded tank would be approx. 4,600m^3 in 2 no. HVO tanks of 2,300 m^3 capacity each. Therefore, the proposed OCGT Generating Plant does fall into a category of development to which the Control of Major Accidents Hazards Regulations 2015 (as amended) applies. The purpose of the proposed development is to support the production of renewable wind energy by providing an alternative energy supply that can react quickly to the electricity grid during periods of low wind energy availability and high user demand. The proposed development will act as backup to variable wind energy supply and thereby assists in Ireland delivering on climate change targets by facilitating more wind generation onto the system.
Risks to human health (water contamination, air pollution)	A construction environmental management plan (CEMP) will be adhered to during the construction phase and an environmental management plan during operations. This will ensure that there will be no impact on any vector (e.g. water contamination, air pollution) that would pose a risk to human health. The site's IE licence from the EPA will govern the environmental management of the proposed OCGT Generating Plant and ensure the operation of the plant and associated environmental emissions do not have any significant adverse impact on the environment. Emission levels should comply with the requirements of the Industrial Emissions Directive and associated Large Combustion Plant BREF. These requirements are

Characteristic	Response
	expected to be included within the IE Licence.

The environmental sensitivity of geographical areas likely to be affected by projects must be considered, with particular regard to the following table:

Table 5.2: *Location of the Proposed Development*

Item	Response
the existing and approved land use	The proposed development site lies within the administrative jurisdiction of Meath County Council. The existing land is used for intensive tillage of barley. The subject site is located in an area that is noted as being increasingly industrialised and thus will form part of a cluster of similar activities within the landscape. The clustering of existing and permitted industrial and energy related infrastructure projects at this location is cited as an example which can be replicated at other locations in Meath in the County Development Plan 2021 – 2027.
the relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground	The proposed development will not have significant effects on soil, land, water or biodiversity as it will cover an area of approximately 10.55 ha only, and there will be no discharges to soil land or water. Topsoil that is stripped off during construction will be used in landscaping on the site and creating berms/terraces. The construction phase will not result in the excavation or removal of any bedrock from the development site. Therefore the construction phase of the development is not predicted to have any significant adverse impact on the geology, soils and hydrogeology (groundwater) of the site. The plant is forecast to run less than 1,800 hours per year. Therefore, there will not be a continuous demand on the water network. Irish Water have confirmed an appropriate volume of water to abstract from the network (3 l/s). A flow control valve will be installed to ensure that this flow rate is not exceeded. Water will be stored in tanks on site, with combined capacities of 84 hours running time backup in the event of water restrictions. The water storage tank will thus allow the plant to continue operating if the mains supply is not available. The area of the proposed development is on a greenfield site adjacent to an industrialised area of a cement plant with quarry activity and a waste to energy facility also nearby. Teagasc Soils maps[5] show the overburden to be fine loamy drift with limestones. The subsoil comprises glacial till derived from sandstones, shales and limestones of the Carboniferous Period. In terms of biodiversity of the site, the existing use is monoculture (barley production), there is no proposed removal of hedgerow etc. and no watercourses exist in the development area. During periods of wet weather, rainwater runoff from the lands would enter a drainage channel that combines with other ditches from surrounding lands and migrates to the River Nanny. The proposed development would collect surface water runoff from hard-standing areas through an attenuation facility where rainwater will be percolated locally and discharged to a drainage ditch running along the eastern boundary of the site and drains to the River Nanny 1.5km away. All water will pass through oil interceptors onsite for reuse and discharge.
Potential of works to impact directly or indirectly on wetlands, riparian areas, river mouths	No wetlands are located within the vicinity of the proposed development. It is also at a sufficient distance away from the closest watercourse (ca. 1.5km), the River Nanny to the south of the site.

[5] http://gis.teagasc.ie/soils/map.php

Item	Response
	The River Nanny discharges to the River Nanny Estuary and Shore SPA. A Natura Impact Statement is submitted as part of the planning application. NIS Conclusion: This NIS has examined and analysed, in light of the best scientific knowledge, with respect to those European sites within the zone of influence of the proposed development, the potential impact sources and pathways, the manner in which these could potentially impact on the European sites' QIs/SCOs and whether the predicted impacts would adversely affect the integrity of the following European Sites that were screened in for Stage 2 assessment: **River Boyne and River Blackwater SAC, River Boyne and River Blackwater SPA, Boyne Coast and Estuary SAC, Boyne Estuary SPA, River Nanny Estuary and Shore SPA**. There are no other European sites at risk of effects from the proposed development. Avoidance, design requirements and mitigation measures are set out within this NIS (and its appendices) and the effective implementation of these mitigation measures will ensure that any impacts on the conservation objectives of European sites will be avoided during the construction, operation and decommissioning phases of the proposed development such that there will be no adverse effects on any European sites. It has been objectively concluded by Scott Cawley Ltd., following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted impacts from the proposed development and the effective implementation of the mitigation measures prescribed, that the proposed development will not adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects.
Potential of works to impact directly or indirectly on coastal zones and the marine environment	The potential effects of the proposed development on the nearest coastal zones and marine environment will be subject to an Appropriate Assessment. The proposed development is ca. 9.6km from the coast. The Appropriate Assessment screening considered ecologically connected Special Protection Areas (SPAs) and Special Areas of Conservation (SACs). The application for planning permission is accompanied by a Natura Impact Statement. NIS Conclusion: This NIS has examined and analysed, in light of the best scientific knowledge, with respect to those European sites within the zone of influence of the proposed development, the potential impact sources and pathways, the manner in which these could potentially impact on the European sites' QIs/SCOs and whether the predicted impacts would adversely affect the integrity of the following European Sites that were screened in for Stage 2 assessment: **River Boyne and River Blackwater SAC, River Boyne and River Blackwater SPA, Boyne Coast and Estuary SAC, Boyne Estuary SPA, River Nanny Estuary and Shore SPA**. There are no other European sites at risk of effects from the proposed development. Avoidance, design requirements and mitigation measures are set out within this NIS (and its appendices) and the effective implementation of these mitigation measures will ensure that any impacts on the conservation objectives of European sites will be avoided during the construction, operation and decommissioning

Item	Response
	phases of the proposed development such that there will be no adverse effects on any European sites. It has been objectively concluded by Scott Cawley Ltd., following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted impacts from the proposed development and the effective implementation of the mitigation measures prescribed, that the proposed development will not adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects. Special Areas of Conservation and Special Protection Areas ecologically connected considered include: River Boyne and River Blackwater SAC (002299), Boyne Coast and Estuary SAC (001957), Boyne Estuary SPA (004080), River Boyne and River Blackwater SPA (004232) and the River Nanny Estuary and Shore SPA (004158).
Potential of works to impact directly or indirectly on mountain and forest areas	Not applicable. No mountain and forest areas are located at or close to the proposed development site. Also, there will be no indirect impact on any mountain or forest area.
Potential of works to impact directly or indirectly on nature reserves and parks	The UNESCO World Heritage Site of Brú na Bóinne is one of the most significant sites of archaeological and cultural heritage in the country. Due to the Outstanding Universal Value and international significance of the area of the World Heritage Site, the site contains a designated core area as well as a surrounding buffer zone as identified on Map 8.1 of the Meath County Development Plan (CDP) 2021 - 2027. The proposed development is located outside of the designated core and outside of the buffer zone area associated with Brú na Bóinne. Due to the distance between Brú na Bóinne and the proposed development (approx. 1.8 km from the proposed site boundary to nearest buffer zone point and 3.5 km to the nearest core area point), and the design of the proposed development, there will be no impact on the Brú na Bóinne world heritage site. A visual impact assessment is submitted as part of the planning application to assist in illustrating the physical and visual nature of the proposed development within the context of the existing landscape and visual setting.
Potential of works to impact directly or indirectly on areas classified or protected under national legislation; Natura 2000 areas designated by Member States pursuant to Directive 92/43/EEC and Directive 2009/147/EC	Storm water from the site will be collected with onsite drainage. This drainage will pass through an oil interceptor where a risk of contamination exists prior to discharge to a drainage ditch that flows in a southeasterly direction approximately 1.5km to the River Nanny. The River Nanny forms part of River Nanny Estuary and Shore SPA. A Natura Impact Statement is submitted as part of the planning application. NIS Conclusion: This NIS has examined and analysed, in light of the best scientific knowledge, with respect to those European sites within the zone of influence of the proposed development, the potential impact sources and pathways, the manner in which these could potentially impact on the European sites' QIs/SCOs and whether the predicted impacts would adversely affect the integrity of the following European Sites that were screened in for Stage 2 assessment: **River Boyne and River Blackwater SAC, River Boyne and River Blackwater SPA, Boyne Coast and Estuary SAC, Boyne Estuary SPA, River Nanny Estuary and Shore SPA**. There are no other European sites at risk of effects from the proposed development. Avoidance, design requirements and mitigation measures are set

Item	Response
	out within this NIS (and its appendices) and the effective implementation of these mitigation measures will ensure that any impacts on the conservation objectives of European sites will be avoided during the construction, operation and decommissioning phases of the proposed development such that there will be no adverse effects on any European sites. It has been objectively concluded by Scott Cawley Ltd., following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted impacts from the proposed development and the effective implementation of the mitigation measures prescribed, that the proposed development will not adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects.
Potential of works to impact directly or indirectly on areas in which there has already been a failure to meet the environmental quality standards, laid down in Union legislation and relevant to the project, or in which it is considered that there is such a failure	The proposed site is located within the River Nanny Catchment. According to EPA monitoring data, the Nanny River is in a generally unsatisfactory ecological condition. The River Nanny discharges to River Nanny Estuary and Shore SPA. The River Nanny is at present considered to be 'Poor' according to Water Framework Directive (WFD) mapping. There will be no effect to current ecological condition of rivers from proposed development. As described previously there are no emissions associated with the proposed development that could have significant effects on these water bodies. Based on the continued adherence to the conditions of the IE licence requirements, there will be no significant impact to nearby surface water or groundwater as a result of the development proposal. Emission levels should comply with the requirements of the Industrial Emissions Directive. These requirements are expected to be included within the IE Licence. The Proposed Development will not result in the deterioration of any water body's status under the WFD nor will it jeopardise the achievement by any such water body of good status under the WFD.
Potential of works to impact directly or indirectly on densely populated areas	Not applicable. The European Commission defines a 'densely populated area' as having at least 50% of the population living in high-density clusters, i.e. contiguous grid cells of 1 km^2 with a density of at least 1,500 inhabitants per square kilometre and a minimum population of 50,000. This typically defines cities and large urban areas. The site is located near an industrialised area approximately 4km from outer limits of Drogheda town.
Potential of works to impact directly or indirectly on landscapes and sites of historical, cultural or archaeological significance	The site is outside the UNESCO World Heritage Site of Brú na Bóinne buffer zone (approx. 1.8 km from the proposed site boundary to nearest buffer zone point and 3.5 km to the nearest core area point). An Archaeological Impact Assessment of the proposed development was prepared by Margaret McCarthy, MA, MIAI to assess the archaeological potential of the proposed development site and to identify constraints or features of archaeological significance within or adjacent to the subject lands for the previous application in 2018. This is included in the Environmental Report submitted with the planning application. The conclusion of the Archaeological Impact Assessment concluded: A large embanked enclosure was detected through geophysical survey and the analysis of LiDAR data at the west side of the subject development lands. A test excavation undertaken at the site in 2019 identified a limited amount of archaeological

Item	Response
	features. A significant number of archaeological sites were also exposed and excavated during the construction of the M1 to the east, and it is considered therefore that there is a high potential for archaeological remains to survive beneath the surface. No above ground trace of the embanked enclosure survives and a number of mitigation measures will be implemented to safeguard the monument. Potential direct impacts to previously undocumented sub-surface archaeological features have also been identified and appropriate mitigation has been recommended and will be implemented. Objectives for the conservation of the monument as well as objectives for the future presentation of the archaeological resource to the public comprise – erection of permanent buffer zone, excavation of archaeological features exposed during the test excavation and monitoring of topsoil removal by archaeologist. A Landscape and Visual Impact Assessment has been completed for the proposed development and is included in the Environmental Report being submitted with the planning application. This assessment was completed by AOS Planning (CAAS Ltd.) and considers and assesses the impact of the proposed development on the appearance and character of the landscape. The assessment has concluded that, following the incorporation of mitigation measures, there will be a permanent, slight-negative impact which will be highly localised on the appearance and character of the area – caused by the introduction of non-agricultural uses. There will be a further increase in localised intensification of landscape effects on nearby amenities along the R 152. These will represent a localised intensification and spatial expansion of pre-existing effects that accord with established use of these lands.

The type and characteristics of the potential impacts must be considered, with particular regard to the following table:

Table 5.3: *Type and Characteristics of the Potential Impacts*

Item	Response
Will a large geographical area be impacted as a result of the proposed works?	No. The proposed development is within a greenfield, ca. 10.55 ha in size. The subject site is located in an area that is noted as being increasingly industrialised and thus will form part of a cluster of similar activities within the landscape. The clustering of existing and permitted industrial and energy related infrastructure projects at this location is cited as an example which can be replicated at other locations in Meath in the County Development Plan 2021 - 2027. Construction works are expected to commence on site in Q4 2023 (subject to receipt of planning permission) with a total duration of 30 months. Any noise and dust emissions arising confined to the immediate site area are subject to the implementation of good practice controls during the works.
Will a large population be impacted as a result of the proposed works?	It is considered that there is no potential for a large population to be adversely affected as a result of the development proposal, during either construction or operational phases. The project works will generate approximately 40 to 60 short term construction jobs on average resulting in a temporary, yet positive, socio-economic impact. Any possible impacts such as dust and noise which may arise in the absence of adequate management and mitigation measures during the construction phase will be short term, temporary in nature and are not expected to be significant. The appointed contractor will be required to implement good practice measures for the control of dust, noise and waste management. A CEMP has been prepared for the site detailing construction environmental management plan for the site. Potential operational impacts in relation to noise, dust, water, traffic, etc. are limited as described previously in Table 5.1.
Are any trans-frontier impacts likely to arise from proposed works?	Due to the size, nature and location of the proposed development it is considered that there is no likely environmental impact associated with the construction or operation of the proposed development outside the Republic of Ireland.
the intensity and complexity of the impact	The proposed development will be a permanent development however there are no significant effects foreseen which would result in long term, adverse environmental impacts. No potential effects arise during its operation, as a facility will be licensed under IE licence conditions will ensure there are no significant permanent, continuous or intermittent environmental effects. The IE licence will govern the environmental management of the OCGT Generating Plant and ensure the operation of the plant and associated environmental emissions do not have any significant adverse impact on the environment. All applicable Best Available Techniques Reference (BREF) Documents as set out by the European Commission will be assessed during the licence application to ensure full compliance to best practice guidance. Possible effects including dust, noise and waste during the construction phase can be readily controlled and if any such effects arise, they will be temporary and short term (30 months). No significant effects beyond the site boundary are considered likely during the construction phase. The probability of significant environmental effects occurring is considered low as a result of on-going site management in compliance with the existing IE licence conditions. No long term effects are foreseen. Nature of impacts are understood and the site location can accommodate a development of

Item	Response
	the proposed sized and nature without significant adverse impacts.
the probability of the impact	It is unlikely that the proposed development would cause significant negative impacts. The proposed development is a reasonably small development situated beside existing industrial facilities.
the expected onset, duration, frequency and reversibility of the impact	The proposed development will result in a new OCGT Generation Plant facility adjacent to an industrialised area. The duration will be long term but can be reversible as the OCGT units can be demounted and relocated, and lands restored to former uses.
the cumulation of the impact with the impact of other existing and/or approved projects	A detailed description of the proposed development is included in Section 2 of this report. Construction works are expected to commence on site in Q4 2023 (subject to receipt of planning permission) with a total duration of 30 months, confined to the area of the proposed development and temporary in nature. No impact is envisaged during construction with 40 to 60 workforce during construction and normal operation workforce of up to 4 people. The site is situated 1.5km from the River Nanny which forms part of the River Nanny Estuary and shore SPA. A Natura Impact Statement is included in the planning application. The site is situated in an industrialised area with a large cement plant and waste to energy facility. The clustering of existing and permitted industrial and energy related infrastructure projects at this location is cited as an example which can be replicated at other locations in Meath in the County Development Plan 2021 - 2027. The site will have minimal visual impact on the area. As discussed in Section 1.1 of this report, SSE have been granted planning permission for the construction of a 110kV transmission sub-station strategic infrastructure development at Platin, Carranstown, Co. Meath by An Bord Pleanála in January 2020 (Case Reference PL17 .303678). Pending approval of the proposed OCGT Generation Plant by Meath County Council, the approved 110 kV Substation will be constructed in conjunction with the proposed OCGT Generating Plant construction. An Outline Construction Environmental Management Plan (CEMP) has been prepared for the proposed development of the OCGT and will align with the CEMP and Traffic Management Plan submitted to and agreed with Meath County Council prior to commencement of development works on the approved 110kV Substation. It is anticipated works on both the Substation and OCGT Generating Plant will commence in Q4 2023. The mitigation measures identified in the Environmental Report, the Natura Impact Statement and the Planning Conditions associated with both developments will be implemented in full during the construction phase of these projects. Visual impact from the development has been considered as part of the Landscape and Visual Impact Assessment. There are some other planning applications which have been granted in the vicinity in recent years, as detailed in Section 3 of this report. These projects are not considered to have a cumulative negative impact with the proposed development as they relate to existing operations. The surrounding area is established with industrial facilities.
the possibility of effectively reducing the impact	No significant emissions will arise as a result of the proposed development. Established site management measures, including bunding, containment and surface water monitoring will ensure that significant environmental effects are avoided. On the basis of compliance with a proposed IE licence

Item	Response
	for the site, it is considered that sufficient measures for the avoidance, reduction and control of environmental effects are in place for the proposed development. As required, other mitigation measures will be deployed.

6 Conclusions

The proposed development has been assessed in the context of mandatory thresholds for EIA as set out in Schedule 5 (Parts 1 and 2) of the Planning and Development Regulations 2001 (as amended). It is considered that the Proposed Development is a "sub-threshold" development as it is a class of development under Part 2 of Schedule 5 of the Planning and Development Regulations 2001 (as amended) but does not equal or exceed the relevant threshold. Further assessment has been completed considering the criteria for sub-threshold EIA as set out in Schedule 7 of the same regulations. It is concluded that an EIAR is not required as part of the planning application, however it is noted that Meath County Council will make its own screening determination as it is the competent authority for this application.

The scale and nature of the project are not considered to present a risk of significant environmental impact during construction and operation, either alone or in cumulation with other planned/approved projects or existing industrial facilities adjacent to the site.

The possible effects during the construction phase have also been considered. As with all construction works, there is potential for the generation of dust, noise and waste. However, these aspects will readily managed by the implementation of routine good practice construction measures and adherence to a project construction environmental management plan. Any possible effects will be short term. Construction works are expected to commence on site in Q4 2023 (subject to receipt of planning permission) with a total duration of 30 months, will be confined to the area of the proposed development and temporary in nature.

Given the scale and nature of the project, it is respectfully submitted that requirement for EIA can be screened out. This is consistent with earlier EIA Screening determinations made by ABP and MCC in relation to the 110kv substation and the previous OCGT planning application.

Appendix A

Appraisal in accordance with Schedule 5 Part 1, Planning & Development Regulations

Table A.1: *Review of Project – Classes of Development requiring mandatory EIA (Part 1)*

Development for the purposes of Part 10		Assessment for Proposed Development
Part 1		
1	A crude oil refinery (excluding undertakings manufacturing only lubricants from crude oil) or an installation for the gasification and liquefaction of 500 tonnes or more of coal or bituminous shale per day.	Not applicable
2(a)	A thermal power station or other combustion installation with a heat output of 300 megawatts or more.	It is applicable, however the Proposed Development falls below the threshold so has been assessed as a sub-threshold development. See Section 5.1.
2(b)	A nuclear power station or other nuclear reactor including the dismantling or decommissioning of such a power station or reactor1 (except a research installation for the production and conversion of fissionable and fertile materials, whose maximum power does not exceed 1 kilowatt continuous thermal load).	Not applicable
3(a)	All installations for the reprocessing of irradiated nuclear fuel.	Not applicable
3(b)	Installations designed – for the production or enrichment of nuclear fuel, – for the processing of irradiated nuclear fuel or high level radioactive waste, – for the final disposal of irradiated fuel, – solely for the final disposal of radioactive waste, – solely for the storage (planned for more than 10 years) of irradiated fuels or radioactive waste in a different site than the production site	Not applicable
4(a)	Integrated works for the initial smelting of cast iron and steel	Not applicable
4(b)	Installations for the production of non-ferrous crude metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic processes.	Not applicable
5 (a) (b) (c)	An installation for the extraction of asbestos or for the processing and transformation of asbestos or products containing asbestos- in case the installation produces asbestos-cement products, where the annual production would exceed 20,000 tonnes of finished products, in case the installation produces friction material, where the annual production would exceed 50 tonnes of finished products, or in other cases, where the installation would utilise more than 200 tonnes of asbestos per year.	Not applicable

Development for the purposes of Part 10		Assessment for Proposed Development
Part 1		
6	Integrated chemical installations, i.e. those installations for the manufacture on an industrial scale of substances using chemical conversion processes, in which several units are juxtaposed and are functionally linked to one another and which are-	
(a)	for the production of basic organic chemicals,	Not applicable
(b)	for the production of basic inorganic chemicals,	Not applicable
(c)	for the production of phosphorous, nitrogen or potassium based fertilisers (simple or compound fertilisers),	Not applicable
(d)	for the production of basic plant health products and of biocides,	Not applicable
(e)	for the production of basic pharmaceutical products using a chemical or biological process,	Not applicable
(f)	for the production of explosives.	Not applicable
7	A line for long-distance railway traffic, or an airport with a basic runway length of 2,100 metres or more.	Not applicable
8(a)	Inland waterways and ports for inland waterway traffic which permit the passage of vessels of over 1,350 tonnes.	Not applicable
8(b)	Trading ports, piers for loading and unloading connected to land and outside ports (excluding ferry piers) which can take vessels of over 1,350 tonnes.	Not applicable
9	Waste disposal installations for the incineration, chemical treatment as defined in Annex IIA to Directive 75/442/EEC under heading D9, or landfill of hazardous waste (i.e. waste to which Directive 91/689/EEC4 applies).	Not applicable
10	Waste disposal installations for the incineration or chemical treatment as defined in Annex IIA to Directive 75/442/EEC under heading D9, of non-hazardous waste with a capacity exceeding 100 tonnes per day.	Not applicable
11	Groundwater abstraction or artificial groundwater recharge schemes, where the annual volume of water abstracted or recharged is equivalent to or exceeds 10 million cubic metres.	Not applicable.
12(a)	Works for the transfer of water resources between river basins, where this transfer aims at preventing possible shortages of water and where the amount of water transferred exceeds 100 million cubic metres per year. (Transfers of piped drinking water are excluded.)	Not applicable

Development for the purposes of Part 10		Assessment for Proposed Development
Part 1		
12(b)	In all other cases, works for the transfer of water resources between river basins, where the multi-annual average flow of the basin of abstraction exceeds 2,000 million cubic metres per year and where the amount of water transferred exceeds 5 per cent of this flow. (Transfers of piped drinking water are excluded.)	Not applicable
13	Waste water treatment plants with a capacity exceeding 150,000 population equivalent as defined in Article 2, point (6), of Directive 91/271/EEC.	Not applicable
14	Extraction of petroleum and natural gas for commercial purposes where the amount extracted exceeds 500 tonnes per day in the case of petroleum and 500,000 cubic metres per day in the case of gas.	Not applicable
15	Dams and other installations designed for the holding back or permanent storage of water, where a new or additional amount of water held back or stored exceeds 10 million cubic metres.	Not applicable
16	Pipelines with a diameter of more than 800mm and a length of more than 40km: (a) for the transport of gas, oil or chemicals, and, (b) for the transport of carbon dioxide (CO_2) streams for the purposes of geological storage, including booster stations.	Not applicable
17 (a) (b) (c)	Installations for the intensive rearing of poultry or pigs with more than- 85,000 places for broilers, 60,000 places for hens, 3,000 places for production pigs (over 30 kilograms), or 900 places for sows.	Not applicable
18 (a) (b)	Industrial plants for the- production of pulp from timber or similar fibrous materials, production of paper and board with a production capacity exceeding 200 tonnes per day.	Not applicable
19	Quarries and open-cast mining where the surface of the site exceeds 25 hectares.	Not applicable
20	Construction of overhead electrical power lines with a voltage of 220 kilovolts or more and a length of more than 15 kilometres.	Not applicable. See Section 5.1.
21	Installations for storage of petroleum, petrochemical, or chemical products with a capacity of 200,000 tonnes or more.	Not applicable

Development for the purposes of Part 10		Assessment for Proposed Development
Part 1		
22	Any change to or extension of projects listed in this Annex (Part 1 of Schedule 5), where such a change or extension in itself meets the thresholds, if any, set out in this Annex (Part 1 of Schedule 5).	Not applicable.
23	Storage sites pursuant to Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide.	Not applicable
24	Installations for the capture of CO_2 streams for the purposes of geological storage pursuant to Directive 2009/31/EC from installations covered by this Part, or where the total yearly capture of CO_2 is 1.5 megatonnes or more.	Not applicable

Appendix B

Appraisal in accordance with Schedule 5 Part 2, Planning & Development Regulations

Part 2 of Schedule 5 of the Planning and Development Regulations 2001 as amended lists 15 classes of development which may be subject to EIA. For each of the 15 classes, thresholds relevant to that development class are further defined to determine if a project's scale is of the nature to have potential for significant environmental effects and thereby warrant EIA.

Each of the development classes have been considered in Table B.1 for relevance to the proposed development. Where it is clear the proposed development is outside a particular development class, this has been recorded and therefore associated sub-threshold(s) are not listed.

Where there is a similarity between a particular development class heading and the proposed development, each associated sub-threshold is further examined.

Table B.1: *Review of Proposed Development– Classes of Development requiring mandatory EIA (Part 2)*

Development for the purposes of Part 10		Assessment for Proposed Development
Part 2		
1	**Agriculture, Silviculture and Aquaculture**	Not Applicable
(b)	Projects for the restructuring of rural land holdings, undertaken as part of a wider proposed development, and not as an agricultural activity that must comply with the European Communities (Environmental Impact Assessment) (Agriculture) Regulations 2011, where the length of field boundary to be removed is above 4 kilometres, or where re-contouring is above 5 hectares, or where the area of lands to be restructured by removal of field boundaries is above 50 hectares.	Not Applicable. See Section 5.2.1.
2	**Extractive Industry**	Not Applicable
3	**Energy Industry**	
(a)	Industrial installations for the production of electricity, steam and hot water not included in Part 1 of this Schedule with a heat output of 300 megawatts or more.	It is applicable, however the Proposed Development falls below the threshold so has been assessed as a sub-threshold development. See Section 5.2
(b)	Industrial installations for carrying gas, steam and hot water with a potential heat output of 300 megawatts or more, or transmission of electrical energy by overhead cables not included in Part 1 of this Schedule, where the voltage would be 200 kilovolts or more	It is applicable, however the Proposed Development falls below the threshold so has been assessed as a sub-threshold development. See Section 5.2
(c)	Installations for surface storage of natural gas, where the storage capacity would exceed 200 tonnes	Not Applicable
(d)	Installations for underground storage of combustible gases, where the storage capacity would exceed 200 tonnes	Not Applicable
(e)	Installations for the surface storage of fossil fuels, where the storage capacity would exceed 100,000 tonnes	Not Applicable

Development for the purposes of Part 10		Assessment for Proposed Development
Part 2		
(f)	Installations for industrial briquetting of coal and lignite, where the production capacity would exceed 150 tonnes per day	Not Applicable
(g)	Installations for the processing and storage of radioactive waste not included in Part 1 of this Schedule	Not Applicable
(h)	Installations for hydroelectric energy production with an output of 20 megawatts or more, or where the new or extended superficial area of water impounded would be 30 hectares or more, or where there would be a 30 per cent change in the maximum, minimum or mean flows in the main river channel	Not Applicable
(i)	Installations for the harnessing of wind power for energy production (wind farms) with more than 5 turbines or having a total output greater than 5 megawatts	Not Applicable
(J)	Installations for the capture of CO_2 streams for the purposes of geological storage pursuant to Directive 2009/31/EC from installations not covered by Part 1 of this Schedule	Not Applicable
4	**Production and Processing of Metals**	Not applicable
5	**Mineral Industry**	Not applicable
6	**Chemical Industry (development not included in Part 1 of this Schedule)**	Not applicable
7	**Food Industry**	Not applicable
8	**Textile, leather, wood and paper industries**	Not applicable
9	**Rubber Industry**	Not applicable
10	**Infrastructure Projects**	
(a)	Industrial estate development projects, where the area would exceed 15 hectares	Not applicable
(b)	(i) Construction of more than 500 dwelling units (ii) Construction of a car-park providing more than 400 spaces, other than a car-park provided as part of, and incidental to the primary purpose of, a development (iii) Construction of a shopping centre with a gross floor space exceeding 10,000 square metres (iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere	Not applicable Not applicable Not applicable Not applicable. See Section 5.2.

Development for the purposes of Part 10		Assessment for Proposed Development
Part 2		
(c)	All construction of railways and of intermodal transhipment facilities and of intermodal terminals not included in Part 1 of this Schedule which would exceed 15 hectares in area.	Not applicable
(d)	All airfields not included in Part 1 of this Schedule with paved runways which would exceed 800 metres in length.	Not applicable
(dd)	All private roads which would exceed 2000 metres in length	Not applicable
(e)	New or extended harbours and port installations, including fishing harbours, not included in Part 1 of this Schedule, where the area, or additional area, of water enclosed would be 20 hectares or more, or which would involve the reclamation of 5 hectares or more of land, or which would involve the construction of additional quays exceeding 500 metres in length.	Not applicable
(f)	(i) Inland waterway construction not included in Part 1 of this Schedule which would extend over a length exceeding 2 kilometres. (ii) Canalisation and flood relief works, where the immediate contributing sub-catchment of the proposed works (i.e. the difference between the contributing catchments at the upper and lower extent of the works) would exceed 100 hectares or where more than 2 hectares of wetland would be affected or where the length of river channel on which works are proposed would be greater than 2 kilometres.	Not applicable
(g)	Dams and other installations not included in Part 1 of this Schedule which are designed to hold water or store it on a long-term basis, where the new or extended area of water impounded would be 30 hectares or more.	Not applicable
(h)	All tramways, elevated and underground railways, suspended lines or similar lines of a particular type, used exclusively or mainly for passenger transport.	Not applicable
(i)	Oil and gas pipeline installations and pipelines for the transport of CO_2 streams for the purposes of geological storage (projects not included in Part 1 of this Schedule).	Not applicable
(j)	Installation of overground aqueducts which would have a diameter of 1,000 millimetres or more and a length of 500 metres or more.	Not applicable
(k)	Coastal work to combat erosion and maritime works capable of altering the coast through the construction, for example, of dikes, moles, jetties and other sea defence works, where the length of coastline on which	Not applicable

Development for the purposes of Part 10		Assessment for Proposed Development
	Part 2	
	works would take place would exceed 1 kilometre, but excluding the maintenance and reconstruction of such works or works required for emergency purposes.	
(l)	Groundwater abstraction and artificial groundwater recharge schemes not included in Part 1 of this Schedule where the average annual volume of water abstracted or recharged would exceed 2 million cubic metres.	Not applicable.
(m)	Works for the transfer of water resources between river basins not included in Part 1 of this Schedule where the annual volume of water abstracted or recharged would exceed 2 million cubic metres.	Not applicable
11	**Other Projects**	
(a)	All permanent racing and test tracks for motorised vehicles.	Not applicable
(b)	Installations for the disposal of waste with an annual intake greater than 25,000 tonnes not included in Part 1 of this Schedule.	Not applicable
(c)	Waste water treatment plants with a capacity greater than 10,000 population equivalent as defined in Article 2, point (6), of Directive 91/271/EEC not included in Part 1 of this Schedule.	Not applicable
(d)	Sludge-deposition sites where the expected annual deposition is 5,000 tonnes of sludge (wet).	Not applicable
(e)	Storage of scrap metal, including scrap vehicles where the site area would be greater than 5 hectares.	Not applicable
(f)	Test benches for engines, turbines or reactors where the floor area would exceed 500 square metres.	Not applicable
(g)	All installations for the manufacture of artificial mineral fibres.	Not applicable
(h)	All installations for the manufacture, packing, loading or placing in cartridges of gunpowder and explosives or for the recovery or destruction of explosive substances.	Not applicable
(i)	All knackers' yards in built-up areas.	Not applicable
12	**Tourism and Leisure**	Not applicable
13	**Changes, extensions, development and testing**	
(a)	Any change or extension of development already authorised, executed or in the process of being executed (not being a change or extension referred to in Part 1) which would:-	Not applicable.

Development for the purposes of Part 10		Assessment for Proposed Development
	Part 2	
	(i) result in the development being of a class listed in Part 1 or paragraphs 1 to 12 of Part 2 of this Schedule, and, (ii) result in an increase in size greater than – - 25 per cent, or - an amount equal to 50 per cent of the appropriate threshold, whichever is the greater. (In this paragraph, an increase in size is calculated in terms of the unit of measures of the appropriate threshold.)	
(b)	Projects in Part 1 undertaken exclusively or mainly for the development and testing of new methods or products and not used for more than 2 years.	Not applicable
(c)	Any change or extension of development being of a class listed in Part 1 or paragraphs 1 to 12 of Part 2 of this Schedule, which would result in the demolition of structures, the demolition of which had not previously been authorised, and where such demolition would be likely to have significant effects on the environment, having regard to the criteria set out under Schedule 7.	Not applicable. The site is a greenfield site and requires no demolition works.
14	Works of Demolition Works of demolition carried out in order to facilitate a project listed in Part 1 or Part 2 of this Schedule where such works would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7.	Not applicable. The site is a greenfield site and requires no demolition works.
15	Any project listed in this Part which does not exceed a quantity, area or other limit specified in this Part in respect of the relevant class of development but which would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7.	Not applicable. See Section 5.2.

Attachment 2

Predictive Noise Modelling and Impact Assessment Report

Predictive Noise Modelling and Impact Assessment Report

SSE Generation Ireland Ltd
Planning Support
IE0312377-22-RP-0020, Issue: A

Issue date: 26 Jul 2023

Document Sign Off

Predictive Noise Modelling and Impact Assessment Report

SSE Generation Ireland Ltd
Planning Support
IE0312377-22-RP-0020, Issue A

File No:IE0312377.22.140

CURRENT ISSUE					
Issue No: A	Date: 26 Jul 2023	Reason for issue: Planning			
Sign Off	Originator	Checker	Reviewer	Approver	Customer Approval (if required)
Print Name	PAUL.OSULLIVAN	AINE.MONAGHAN		PAUL.OSULLIVAN	
Signature	**Authorised Electronically**				
Date	19 Jul 2023	26 Jul 2023		26 Jul 2023	

PREVIOUS ISSUES							
Issue No	Date	Originator	Checker	Reviewer	Approver	Customer	Reason for issue

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Attachment 1
Calibration Certs for Noise Meter and Calibrator

Information in Attachment 1 of this report was supplied by Sonitus Systems. PM Group does not accept responsibility for the accuracy and / or completeness of this information.

1 Introduction

1.1 General

This report has been prepared to assess the potential for noise effects from the Proposed Development at the SSE Site in Carranstown and Caulstown, Platin, Duleek, Co. Meath. The Proposed Development is an Open Cycle Gas Turbine (OCGT) Plant with a capacity up to 170MW (electrical output), which is designed to support the national electricity network and to operate during peak demand periods.

The plant design will allow for flexible operation so the plant can cater for high demand and respond quickly to fluctuations on the electricity grid. Operation over extended periods is not foreseen. The running regime, in terms of load and runtime, will depend on the size of the peak load experienced. It is anticipated that the plant will operate a maximum of 1,800 hours per year with the highest expected demand during winter months.

Baseline sound pressure levels were measured in the area surrounding the Site and prediction modelling of the proposed on-site activity was carried out to determine the expected development emissions at the nearest noise sensitive locations during operation.

1.1.1 Evidence of Technical Competence and Experience

This report and the predictive noise modelling contained within has been completed by Paul O'Sullivan, a Senior Environmental Consultant with PM Group. Paul has a BEng(Hons) in Civil and Environmental Engineering, a ME Engineering with Business, and a Post Grad Diploma in Acoustics and Noise Control from the Institute of Acoustics. Paul is a Chartered Engineer with Engineers Ireland, CEng MIEI, and is an Affiliate member with the Institute of Environmental Management and Assessment (IEMA). Paul has 11 years environmental consulting experience, including leading and supporting in the preparation of multiple Environmental Impact Assessments (EIAs) for industrial facilities, as well as the completion of numerous noise impact assessments.

The baseline noise survey was carried out by Anthony Maunsell, a Senior Environmental Consultant with PM Group. Antony has a BSc in Environmental Science, and has a Certificate of Competence in Environmental Noise Measurement from the Institute of Acoustics. Anthony has over 20 years' experience in Environmental, Occupational & Safety Consulting.

Anthony was accompanied by Julia Carroll, an Environment and Sustainability Consultant with PM Group, for the evening and night-time surveys, for safety purposes. Julia has a BA in Environmental Science. Julia is an Affiliate member with The Institute of Environmental Science Association of Ireland (ESAI). Julia has two years' experience in environmental consulting, including supporting EIAs.

1.2 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)[1], 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).

[1] IEMA (2014). Guidelines for Environmental Noise Impact Assessment. Available at: https://www.iema.net/download-document/236678 [accessed May 2023]

1.3 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 0.14mm/s to 0.3mm/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 15mm/s) are required to cause structural damage.

During the construction phase of the development, it is anticipated that there will be no rock breaking, but there may be piling. The requirement for piling will be confirmed during design development of the project. The potential impacts of piling activities during the construction phase have been assessed in Chapter 8 of the Environmental Report being submitted as part of this planning application.

There will be no vibration associated with the operation of the proposed facility which could impact on the environment. On this basis, an assessment of potential vibration impacts during the operational phase is not considered relevant for inclusion.

2 Assessment Methodology

2.1 General

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

- Pre-development Stage / Baseline Assessment – current sound pressure levels at nearby noise sensitive locations (NSLs)[2] were measured to provide background baseline data to which predicted future noise levels for the area can be compared. Baseline noise measurements were carried out on the 27th and 28th March 2023 during day, evening and night-time periods, in accordance with EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (2016)[3].
- Construction Stage – potential sound pressure levels and associated impacts arising from construction activities were considered, in order to develop sufficient noise mitigation measures for the construction phase.
- Operational Stage – sound pressure level emissions from future site operations were predicted in order to assess the impact on the existing noise levels in the environment in terms of subjective impact. The model results were combined with the ambient baseline noise levels to assess the impact of the Proposed Development, and to determine appropriate mitigation measures as required.

2.1.1 Guidelines for Noise Impact Assessment

The Guidelines for Noise Impact Assessment[4] (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 2.1.

[2] Noise Sensitive Location (NSL) defined 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*" (EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (2016))

[3] EPA (2016). Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4). Available at: https://www.epa.ie/pubs/advice/noise/NG4%20Guidance%20Note%20(January%202016%20Update).pdf [accessed May 2023]

[4] IEMA (2014). Guidelines for Environmental Noise Impact Assessment. Available at: https://www.iema.net/download-document/236678 [accessed May 2023]

Table 2.1: *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) T = either 16hr day or 8hr night
Negligible	Negligible	≥ 0 dB and < 1 dB
	Minor	≥ 1 dB and < 3 dB
Minor	Moderate	≥ 3 dB and < 5 dB
Moderate	Major	≥ 5 dB and < 10 dB
Major		≥ 10 dB

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 2.2.

Table 2.2: *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

2.1.2 EPA Guidelines

Industrial Emission Licence Conditions

In order to negate the potential effects from noise, the EPA sets noise emission limits, for noise from EPA licensed sites[5] at boundary, noise sensitive locations or a combination of both. The limits expected to be applied to the SSE Site at off-site noise sensitive locations as part of its Industrial Emission Licence 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}

[5] WHO (2000). Guidelines for Community Noise

The predicted levels are used for compliance analysis with the relevant sound level criteria specified in the EPA's 2016 *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).*

EPA Definitions of Significance and Duration of Effects

The definitions of the significance of effects and the durations of effects have been identified on the basis of the Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR) (2022)[6], as provided in Tables 2.3 and 2.4, respectively. Please note that, although an EIAR is not required for this Proposed Development, the terminology from this guidance has been used as best practice for describing environmental effects.

Table 2.3: *EPA Guidelines on Significance of Effects*

Significance	Definition
Imperceptible	An effect capable of measurement but without noticeable consequences.
Not Significant	An effect that causes noticeable changes in the character of the environment but without noticeable consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect that by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.

Table 2.4: *EPA Guidelines on Duration of Effects*

Duration	Definition
Momentary Effects	Effects lasting from seconds to minutes.
Brief Effects	Effects lasting less than a day.
Temporary Effects	Effects lasting less than a year.
Short-Term Effects	Effects lasting one to seven years.
Medium-Term Effects	Effects lasting seven to fifteen years.
Long-Term Effects	Effects lasting fifteen to sixty years.
Permanent Effects	Effects lasting over sixty years.

2.1.3 Cumulative Effects

In order to determine if there are any developments in the nearby area which have potential to cause a cumulative effect on noise emissions in the vicinity of the Proposed Development, a

[6] EPA (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR). Available at: https://www.epa.ie/publications/monitoring--assessment/assessment/guidelines-on-the-information-to-be-contained-in-environmental-impact-assessment.php [accessed May 2023]

search was completed[7] on the Meath County Council (MCC) and An Bord Pleanála (ABP) websites for active planning applications yet to be determined and recently granted planning applications. The following applications and permissions have been reviewed as part of this noise impact assessment to determine their relevance for inclusion in a cumulative impact assessment with the Proposed Development, as they are considered to have the potential to cause noise emissions due to their nature, and have the potential to cause cumulative noise effects with the Proposed Development due to their proximity to the Proposed Development Site. All other recent developments in the area as described in the Environmental Report which accompanies this planning application are considered to be a sufficient distance from the Proposed Development Site to rule out the potential for cumulative effects.

- Indaver (MCC Case Reference FS16071, FS16072, FS18022) - Alterations to waste-to-energy facility. The applications relate to minor changes to existing operations, and there are no details in relation to proposed noise emissions in the relevant planning applications.
- Irish Cement (ABP Case Reference PL17 .PA0050) to facilitate further replacement of fossil fuels with alternative fuels and allow for the introduction of alternative raw materials in the manufacturing of cement. The Environmental Impact Assessment (EIA) Report which was submitted to ABP states that there are no major new noise sources proposed as part of this development, and therefore no noise data associated with this development was provided in the EIAR and no detailed modelling or calculations were carried out.
- Irish Cement (ABP Case Reference PL17.309308) - 20 year permission for a 13.5 hectare extension to existing Overburden Management Facility. A detailed noise impact assessment was completed as part of the EIA Report submitted with the planning application which determined the potential for noise effects from the development on the surrounding environment.
- Irish Cement (MCC Case Reference 212417) - an extension to an existing bulk materials storage shed and ancillary site works. The cover letter accompanying this planning application stated that an EIA was not required to be submitted with the planning application, and no details in relation to potential noise emissions from the facility were provided with the application.
- Indaver (ABP Case Reference PA17.307433) – an extension of the facility to allow an increase in the waste treatment capacity of the site. A detailed noise impact assessment was completed as part of the EIA Report submitted with the planning application which determined the potential for noise effects from the development on the surrounding environment.

It is noted that SSE has permission for a 110kV Substation strategic infrastructure development adjacent to the Proposed Development Site (ABP Case Reference PL17.303678). The construction of the Substation is dependent on the receipt of planning permission for the Proposed Development for which this planning application relates. The construction and operational phases of the Substation will coincide with the construction and operational phases of the Proposed Development; therefore the Substation is being included in the main assessment of potential affects alongside the Proposed Development, and not part of the cumulative assessment.

For the reasons stated under each of the bullet points above, it is concluded that only the Irish Cement development (ABP Case Reference PL17.309308) and Indaver development (ABP Case Reference PA17.307433) need to be considered as part of an operational cumulative noise impact assessment with the Proposed Development to which this planning application relates.

In addition, the Proposed Development will be assessed with all other existing activities and developments in the area by combining the background noise monitoring results with the predicted noise impacts from the Proposed Development (see Section 5).

[7] A search of the MCC and ABP websites for active and recently granted planning applications was carried out in May 2023.

3 Characteristics of Proposed Development

3.1 Construction Phase

It is anticipated that construction works on Site will commence in Q4 2023 (subject to receipt of planning permission) and that the expected duration of the construction phase will be 30 months.

Normal construction working hours will be daytime only 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. The total number of construction staff on-site will vary during the construction phase of the development but is expected to peak at 40-60 persons.

A temporary construction compound will be erected 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 for security and safety purposes and temporary lighting supplied as necessary.

The construction works, in summary, will involve site clearance and preparation, laying of foundations for plant and buildings (possibly including piling), structural steelwork and cladding, installation of plant and equipment, concrete works (bunds etc.), hard surfacing and paving, landscaping and fencing. Construction equipment will include heavy duty earthmoving and excavating equipment, Heavy Goods Vehicles (HGVs) and concrete trucks, mobile cranes and hoists.

The construction of the Proposed Development and the approved Substation strategic infrastructure development adjacent to the Proposed Development Site (ABP Case Reference PL17.303678) will be carried out concurrently.

All of the above will act as potential noise sources which may increase the ambient sound pressure levels at noise sensitive locations with the potential to create noise during the construction phase.

3.2 Operational Phase

The proposed development will comprise a 170MW (electrical output) Open Cycle Gas Turbine (OCGT) Power Plant. The proposed development will comprise an electricity generating plant which will use Hydrotreated Vegetable Oil (HVO) as fuel and will be connected to a previously permitted 110kV substation (ABP-303678-19) and associated site works and improved access from the R152. The development comprises the following elements:

a) Three gas turbine buildings (each 990m^2) each housing 1 no. turbine, 1 no. generator and auxiliary equipment with a total of 269 MWth (thermal output) generating capacity all on concrete plinths.

b) The power plant will have three exhaust stacks (25m in height), one exhaust stack per OCGT. Therefore, each OCGT will comprise a standalone Large Combustion Plant. The power plant may need to utilise selective catalytic reduction (SCR) (c.18m high, 4.5m width, 14m length) for nitrogen oxide (NOx) abatement.

c) Water treatment plant comprising:

- a 275m^2 Deionising Building (6m high x 11m wide x 25m long)
- a raw water treatment tank of 2,262m^3 (12.8m high)
- a deionised water tank (max. volume of 3,925m^3) (15.4m high)
- a processed water tank of 450m^3 (9m high)
- 1 no. 20m^2 firefighting water tank of 45m^3 (2m high)
- 1 no. 25m^2 firewater module (4m high x 5m wide x 5m long)

- 1 no. sanitary foul water cesspool tank of 79m^3 located underground (1.98m high x 2.5m wide x 16m long)

d) 2 no. HVO tanks (max. storage of 2300 m^3 of HVO per tank), 13m high with a diameter of 15m and associated fuel pumping and filtering equipment and pipework, within a 43.5m L x 45.5m W x 1.5m H bund with a capacity of 2,970m^3

e) 1 no. ammonia tank (1.8m high x 3.5m length) with bund (1.5m high x 2.5 m wide x 5 m long)

f) 1 no. fuel polishing system (3m high x 6m wide x 24m long)

g) 2 no. 110kV transformers each 160m^2, and each measuring (5m high x 10m wide x 15m long). 3 no. Lightning Masts (18m in height) and kiosks, cable gantry connection to the adjoining consented 110kV Substation.

h) a 520m^2 services building (6m high x 13m wide x 40m long)

i) a 160m^2 Switchgear (MV) building (5m high x 6.1m wide x 26.3m long)

j) all other miscellaneous and ancillary site works, including: 12 no. Car parking spaces and 1 No. fuel unloading bay, one lowered site platform area, new internal roads, and hard and soft landscaping including material berms (1.2m to 2m high), a temporary construction compound, temporary security building, and associated fencing.

k) New road markings, including deceleration lane approaching the site, on the R152 .

The proposed development will include connection to public water mains and wastewater provision, supplied by Uisce Éireann. There is no sewer connection required as foul and process waste will be collected in a sealed tank and emptied by a specialist waste service provider.

The plant will be operated as a backup peaking plant and will thus only operate during periods when electricity demand is high.

The proposed plant will be designed for flexible operation, allowing for fast starts, load following and cycling capabilities, and will be able to respond rapidly to load changes on the grid (e.g. due to wind power variation).

The proposed development will connect to a previously consented 110 kV substation which will be located adjacent and to the south-west of the proposed OCGT Power Plant.

Substation Strategic Infrastructure Development

As mentioned previously, SSE has planning permission for a 110kV Substation strategic development infrastructure development adjacent to the Proposed Development Site (ABP Case Reference PL17.303678). The Environmental Report which was submitted as part of the planning application states that there are no major new operational noise sources proposed as part of this development; therefore there is no requirement to add noise sources to the assessment for the Proposed Development for which this planning application relates to account for the Substation development.

4 Receiving Environment

4.1 Existing Site

Much of the surrounding area is semi-rural in nature with an industrialised area to the north-west of the Site involving a quarry and cement plant approximately 500m away, and Indaver Waste to Energy Facility 200m away from the Proposed Development Site. The Paul Kavanagh Vehicle Test Centre is adjacent to the northern boundary of the Site. The ambient noise levels in the area are likely to be influenced by the existing industrial development and also road traffic noise from the nearby R152 regional road and the M1 motorway. Residential development in the vicinity of the Site is scattered, typical of a rural location. There is a cluster of houses located to the north and west of the SSE Site consisting of three houses and a cluster of businesses immediately north, two houses on the northern side of the public road, two houses to the west and one farm to the South West of the SSE Site. To the east one farm is present and to the southeast are two houses and a school.

The Site boundary for the purposes of the planning application, and surrounding environment are depicted in Figure 4.1.

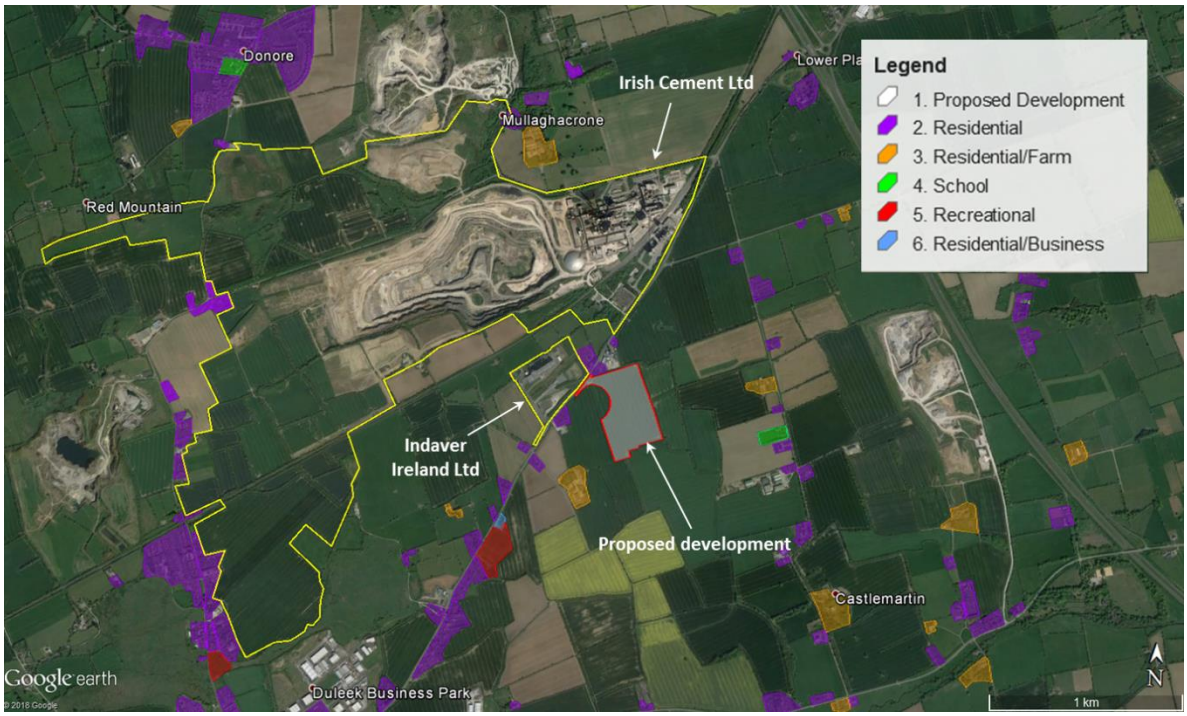

Figure 4.1: *Site Boundary (shown with red edging around white area) and Surrounding Receptors (Base Map: Google Earth, Annotated by PM Group)*

4.2 Baseline Surveying

4.2.1 Baseline Noise Survey

Baseline surveys were carried out by PM Group on the 27th and 28th March 2023. The baseline surveys were carried out in accordance with the EPA's NG4 Guidance Note[8] at five noise sensitive

[8] EPA (2016). Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4). Available at: https://www.epa.ie/pubs/advice/noise/NG4%20Guidance%20Note%20(January%202016%20Update).pdf [accessed May 2023]

locations (NSL) in the vicinity of the Proposed Development Site as described in Table 4.1 and shown in Figure 4.2.

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

- three consecutive 30-minute periods at all NSLs during the daytime survey (07:00-19:00 hours);
- over a single 30-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).

The results of the baseline monitoring are presented in Tables 4.2 to 4.4.

Contemporaneous weather observations were noted by the surveyor and are presented in Tables 4.2 to 4.4. 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 this section.

The results of the baseline surveys include audible sources at existing facilities in the vicinity of the Proposed Development Site and are cumulatively added to the proposed contribution from the noise sources included in the Proposed Development in Section 5.2 of this report.

Table 4.1: *Description of Noise Monitoring Points*

Noise Monitoring Point (NMP)	Location Description	Irish Grid Co-ordinates
NSL1	5m from the main road behind hedge/wall near a double storey residential dwelling house approx. 400m southwest from closest point of Site boundary.	306245E, 270489N
NSL2	7m from the main road at the side boundary of a field at the closest accessible point to a nearby single storey residential dwelling house within the proposed Site boundary.	306460E, 270809N
NSL3	Adjacent to northern Site boundary, a single storey residential dwelling house and the Paul Kavanagh Vehicle Test Centre.	306572E, 270917N
NSL4	Approx. 500m east of closest point of the Site boundary. 2m from the edge of the road at a gate 70m from a nearby double storey residential dwelling house.	307447E, 271021N
NSL5	Location on the edge of a main road between two double storey residential dwellings approx. 700m southeast of closest point of Site boundary.	307591E, 270534N
NSL6	To rear of residential property to the southwest approx. 200m from Site boundary **Note:** Noise monitoring was not undertaken at this location as access was not available. However this location is included in the assessment of operational noise impacts, with baseline noise levels for NSL1 used as best available representative information for NSL6.	306522E, 270381N

Figure 4.2: *Proposed Development Site & Nearest Noise Sensitive Locations (NSLs) (Base Map: Google Earth, Annotated by PM Group)*

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 06/07/2022 in accordance with its test procedure TP-SLM-1, and to IEC 61672-3:2006 and IEC 61672-1:2003 (recalibration is required every 2 years). The calibration cert is provided in Attachment 1 of this report.
- Brüel and Kjaer Type 4231 Calibrator (Serial no. 2229913).
  - Last calibrated by Sonitus Systems on 06/07/2022 in accordance with its test procedure TP-ACOCAL-1, and to BS EN 60942:2003 (recalibration is recommended every year). The calibration cert is provided in Attachment 1 of this report.
- 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 [27th Mar 2023 (09:59 – 17.54)]**

  Dry conditions were observed for the entire monitoring period. 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.

- **Evening Time [27th Mar 2023 (19:52 – 22:52)]**

  Dry conditions were observed for the entire monitoring period. It was cool and overcast. Wind strengths fluctuated during the monitoring period but remained below 5m/s at all times.

Night-time [27th-28th Mar 2023 (23:07 – 01:48)]

Dry conditions were observed for the entire monitoring period. It was cold and overcast. Wind strengths fluctuated during the monitoring period but remained below 5m/s at all times.

4.2.2 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 20μPa 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 sound 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_{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_{Aeq} value is the A-weighted L_{eq}.

- **L_{A90} and L_{A10} Values (dB(A))**

  The L_{A90} and L_{A10} values represent the A-weighted sound pressure levels exceeded for a percentage of the instrument measuring time. The L_{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_{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_{AMax} (dB(A))**

  The maximum instantaneous value recorded over the monitoring period including A-weighting.

- **$L_{Ar,T}$ (dB(A))**

  The Rated Noise Level, equal to the L_{Aeq} during a specified time interval (T), plus specified adjustments for tonal character and/or impulsiveness of the sound.

- **Tonal Noise**

  According to the EPA NG4 Guidance Note, Section 5.1, 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.

4.2.3 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 4.2, 4.3 and 4.4 respectively. The audible noise sources during each measurement are also described in Tables 4.2-4.3.

Table 4.2: *Baseline Noise Monitoring Results – Daytime Monitoring*

Noise Monitoring Point	Time Period	L_{Aeq} dB	L_{AMax} dB	L_{A10} dB	L_{A90} dB	Audible sounds during measurement period
NSL1 (1 of 3)	Date: 27/03/2023 Start time: 13:08 Duration: 30 minutes	79	95	83	52	- Constant road traffic - Air Traffic - Bird song
NSL1 (2 of 3)	Date: 27/03/2023 Start time: 13:38 Duration: 30 minutes	79	96	84	56	
NSL1 (3 of 3)	Date: 27/03/2023 Start time: 14:08 Duration: 30 minutes	79	94	84	56	
NSL2 (1 of 3)	Date: 27/03/2023 Start time: 11:31 Duration: 30 minutes	67	82	71	47	- Constant road traffic - Agricultural Machinery working in fields - Slight hum from Irish Cement Limited - Bird song - Air Traffic
NSL2 (2 of 3)	Date: 27/03/2023 Start time: 12:01 Duration: 30 minutes	67	85	71	48	
NSL2 (3 of 3)	Date: 27/03/2023 Start time: 12:31 Duration: 30 minutes	67	83	71	48	
NSL3 (1 of 3)	Date: 27/03/2023 Start time: 09:59 Duration: 30 minutes	64	77	68	50	- Constant road traffic - Agricultural Machinery working in fields - Slight hum from Irish Cement Limited - Bird song - Dog Barking - Air Traffic
NSL3 (2 of 3)	Date: 27/03/2023 Start time: 10:29 Duration: 30 minutes	65	79	68	49	
NSL3 (3 of 3)	Date: 27/03/2023 Start time: 11:00 Duration: 30 minutes	64	83	68	48	
NSL4 (1 of 3)	Date: 27/03/2023 Start time: 14:50 Duration: 30 minutes	63	86	57	45	- Distant traffic - Local traffic - Bird song - Agricultural machinery
NSL4 (2 of 3)	Date: 27/03/2023 Start time: 15:20 Duration: 30 minutes	64	87	58	45	

Noise Monitoring Point	Time Period	L_{Aeq} dB	L_{AMax} dB	L_{A10} dB	L_{A90} dB	Audible sounds during measurement period
NSL4 (3 of 3)	Date: 27/03/2023 Start time: 15:50 Duration: 30 minutes	64	90	61	46	
NSL5 (1 of 3)	Date: 27/03/2023 Start time: 16:24 Duration: 30 minutes	62	89	55	46	- Distant traffic - Local traffic - Bird song - Agricultural Machinery - Local Workshop
NSL5 (2 of 3)	Date: 27/03/2023 Start time: 16:54 Duration: 30 minutes	64	88	60	46	
NSL5 (3 of 3)	Date: 27/03/2023 Start time: 17:24 Duration: 30 minutes	64	88	60	47	

Table 4.3: *Baseline Noise Monitoring Results – Evening Time Monitoring*

Noise Monitoring Point	Time Period	L_{Aeq} dB	L_{AMax} dB	L_{A10} dB	L_{A90} dB	Audible sounds during measurement period
NSL1 (1 of 1)	Date: 27/03/2023 Start time: 21:07 Duration: 30 minutes	75	78	80	46	- Constant road traffic - Air Traffic
NSL2 (1 of 1)	Date: 27/03/2023 Start time: 21:49 Duration: 30 minutes	60	77	65	43	- Constant road traffic - Air Traffic
NSL3 (1 of 1)	Date: 27/03/2023 Start time: 22:21 Duration: 30 minutes	58	64	57	41	- Constant road traffic - Air Traffic
NSL4 (1 of 1)	Date: 27/03/2023 Start time: 20:26 Duration: 30 minutes	60	88	50	44	- Distant road traffic - Local road traffic - Bird song - Workshop nearby
NSL5 (1 of 1)	Date: 27/03/2023 Start time: 19:52 Duration: 30 minutes	62	85	54	43	- Distant road traffic - Local road traffic - Bird song - Workshop nearby

Table 4.4: *Baseline Noise Monitoring Results – Night-time Monitoring*

Noise Monitoring Point	Time Period	L_{Aeq} dB	L_{AMax} dB	L_{A10} dB	L_{A90} dB	Audible sounds during measurement period
NSL1 (1 of 2)	Date: 28/03/2023 Start time: 01:21 Duration: 15 minutes	64	88	59	38	- Constant Traffic - Air traffic - Irish Cement Limited/Indaver barely audible
NSL1 (2 of 2)	Date: 28/03/2023 Start time: 01:33 Duration: 15 minutes	66	88	60	38	
NSL2 (1 of 2)	Date: 28/03/2023 Start time: 00:30 Duration: 15 minutes	53	75	51	37	- Constant Traffic - Air traffic - Irish Cement Limited/Indaver barely audible
NSL2 (2 of 2)	Date: 28/03/2023 Start time: 00:47 Duration: 15 minutes	56	78	54	38	
NSL3 (1 of 2)	Date: 28/03/2023 Start time: 00:15 Duration: 15 minutes	55	71	57	39	- Constant Traffic - Air traffic - Irish Cement Limited/Indaver barely audible
NSL3 (2 of 2)	Date: 28/03/2023 Start time: 00:30 Duration: 15 minutes	56	79	57	39	
NSL4 (1 of 2)	Date: 27/03/2023 Start time: 23:37 Duration: 15 minutes	44	60	46	41	- Constant distant traffic - Air traffic - Some local traffic
NSL4 (2 of 2)	Date: 27/03/2023 Start time: 23:53 Duration: 15 minutes	42	52	45	38	
NSL5 (1 of 2)	Date: 27/03/2023 Start time: 23:07 Duration: 15 minutes	49	67	51	44	- Constant distant traffic - Air traffic - Some local traffic
NSL5 (2 of 2)	Date: 27/03/2023 Start time: 23:22 Duration: 15 minutes	55	85	50	43	

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 for tonal noise outlined in Section 4.2.2 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 no tones identified in any of the measurements during any of the monitoring periods during the daytime, evening time or night-time surveys.

Impulsive Noise

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

4.2.4 Discussion on Existing Noise Environment

The results of the baseline noise surveys for each NSL for the daytime, evening time and night-time periods are detailed in Tables 4.2, 4.3 and 4.4 respectively.

According to Section 4.4.2 of the EPA NG4 Guidance Note, 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 ≤40dB L_{AF90}, and;
- Average Evening Background Noise Level ≤35dB L_{AF90}, and;
- Average Night-time Background Noise Level ≤30dB L_{AF90}.

Location NSL1

The dominant noise source at NSL1 during the daytime survey was constant road traffic from the adjacent road. The average results for NSL1 were 79 dB L_{Aeq} and 55 dB L_{A90} for the daytime period.

The dominant noise source at NSL1 during the evening time survey was constant road traffic from the adjacent road. The results for NSL1 were 75 dB L_{Aeq} and 46 dB L_{A90} for the evening time period.

The dominant noise source at NSL1 during the night-time survey was road traffic passing on the adjacent road infrequently. The average results for NSL1 were 65 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.

Location NSL2

The dominant noise sources at NSL2 during the daytime survey were constant traffic on the adjacent road and farm machinery nearby. The average results for NSL2 were 67 dB L_{Aeq} and 48 dB L_{A90} for the daytime period.

The dominant noise source at NSL2 during the evening time survey was constant traffic on the adjacent road. The results for NSL2 were 60 dB L_{Aeq} and 43 dB L_{A90} for the evening time period.

The dominant noise source at NSL2 during the night-time survey was traffic on the wider road network. The average results for NSL2 were 55 dB L_{Aeq} and 37 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.

Location NSL3

The dominant noise source at NSL3 during the daytime survey was constant traffic on the adjacent road. Farm machinery was audible as well as a slight hum from the nearby Irish Cement plant. The average results for NSL3 were 64 dB L_{Aeq} and 49 dB L_{A90} for the daytime period.

The dominant noise source at NSL3 during the evening time survey was constant traffic on the adjacent road. The results for NSL3 were 58 dB L_{Aeq} and 41 dB L_{A90} for the evening time period.

The dominant noise source at NSL3 during the night-time survey was traffic passing infrequently. The average results for NSL3 were 55 dB L_{Aeq} and 39 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.

Location NSL4

The dominant noise source at NSL4 during the daytime survey was constant traffic on the wider road network. The average results for NSL4 were 64 dB L_{Aeq} and 45 dB L_{A90} for the daytime period.

The dominant noise source at NSL4 during the evening time survey was constant traffic on the wider road network. The results for NSL4 were 60 dB L_{Aeq} and 44 dB L_{A90} for the evening time period.

The dominant noise source at NSL4 during the night-time survey was traffic on the wider road network passing inconsistently. The average results for NSL4 were 43 dB L_{Aeq} and 40 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.

Location NSL5

The dominant noise source at NSL5 during the daytime survey was constant traffic on the wider road network. The average results for NSL5 were of 64 dB L_{Aeq} and 46 dB L_{A90} for the daytime period.

The dominant noise source at NSL5 during the evening time survey was constant traffic on the wider road network. The results for NSL5 were 62 dB L_{Aeq} and 43 dB L_{A90} for the evening time period.

The dominant noise source at NSL5 during the night-time survey was distant traffic on the wider road network. The average results for NSL5 were 52 dB L_{Aeq} and 43 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.

5 Potential Effects

5.1 Construction Phase

It is anticipated that construction works on Site will be commence in Q4 2023 (subject to receipt of planning permission) and that the expected duration of the construction phase will be 30 months. The works for both the approved Substation strategic infrastructure development and the Proposed development for which this planning application relates will be carried out concurrently during this timeframe.

The principal sources of noise during the construction phase will include:

- Ground preparation phase – excavators, dump trucks and dozers for ground excavation, spreading, fill and levelling.
- Structural phase – installation of foundations and erection of new buildings involving the use of equipment such as compressors, generators, pneumatic tools, hand-held power tools, mobile/fixed cranes, etc.
- Vehicular movements to and from the Site which will make use of existing roads.

Due to the nature of the activities undertaken on a large construction Site, there is potential for temporary or sporadic generation of significant levels of noise. Table 5.1 contains the predicted sound pressure levels measured at 10m for the construction equipment anticipated to be used during the construction phase of the Proposed Development as per typical sound pressure level data detailed in '*BS 5228-1:2009+A1:2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise*'.

Table 5.1: *Predicted Noise Levels Generated by Construction Phase Equipment*

Phase	Item of Plant (BS 5228 Ref)	L_{Aeq} @ 10m (dB(A))
Site Preparation & Excavation	Wheeled Loader (C.2/27)	80
	Tracked Excavator (C.2/29)	79
	Dozer (C.2/10)	80
	Backhoe mounted hydraulic breaker (C.5/1)	88
	Hand-held pneumatic breaker (C.5/6)	95
	Rotary Bored Piling Rig (C.3/14)	83
General Site Activities	Articulated Dump Truck (C.4/1)	81
	Large Lorry Concrete Mixer (C.4/21)	77
	Mobile Telescopic Crane (C.4/45)	82
	Tower Crane (C.4/48)	76
	Cutting Concrete Floor Slab with Consaw (C.4/70)	91
	Angle Grinder grinding steel (C.4/93)	80
	Diesel Generator (C.4/76)	61
	Water Pump (diesel)(C.4/88)	68
Road Construction Works	Road Roller (C.5/19)	80
	Asphalt Paver (+Tipper Lorry) (C.5/30)	75

The construction phase of the development will have a moderate negative effect on existing ambient noise levels in the vicinity of the development Site including the NSLs identified for this assessment in Section 4.2 of this report. However any impact will be short-term in nature due to the limited duration (ca. 30 months) of the construction phase.

Cumulative Impacts

There will be a potential for adverse cumulative impacts should there be an overlap of the construction phases of the permitted Irish Cement development (ABP Case Ref. PL17.309308), the permitted Indaver development (ABP Case Ref. PA17.307433), and the Proposed Development (and the approved SSE substation development (ABP Case Reference PL17.303678) which will be constructed at the same time as the Proposed Development for which this planning application relates); however this will be temporary to short-term in duration. Given the temporary or short-term nature of these impacts and with reference to the definitions of significance in Tables 2.3 and 2.4 these impacts are considered to be potentially significant but temporary to short-term. However these will be mitigated to a moderate level by implementation of good construction Site practices (see Section 6.1).

5.2 Operational Phase

There will be a number of noise generating equipment items and activities associated with the operation of the development. 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 4.1.

5.2.1 Prediction Calculation

The sound levels associated with proposed stationary external sources at the Site were predicted according to the International Standard ISO 9313-2: 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 9313-2: 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.

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 5.2, and their locations are illustrated in Figure 5.1.

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 5.1).
- The source elevation (metres) – the height at which noise is emitted (refer to Table 5.2).
- 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 5.2).
- 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. For the purposes of this assessment, in order to predict the maximum possible noise levels, all of the noise sources were assumed to run continuously during the day, evening and night-time. As the plant will not be operated continuously and will only be operated when there is a requirement for additional electricity in the grid, assuming a continuous operation is considered to be a very conservative approach.

- The Receptor Positions – Receptors NSL1-6 are the nearest NSLs as described in Table 4.1 and illustrated in Figure 4.1.
- 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 – Most of the ground at the southern half of the Site was assumed to be hard and reflecting. Ground within the northern half of the Site and outside the Site boundary is mostly grassland and absorbent. The layout for the Proposed Development was used to determine ground conditions for the model.

5.2.2 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 5.2. An image of the noise model with all noise sources associated with the Proposed Development shown is provided in Figure 5.1.

It is noted that in addition to the noise sources provided in Table 5.2, there will be fire water pumps housed within the fire water module. As these pumps are located internally within the module, and given that they will not be running during normal operations, only in the event of a fire being fought at the site, they have not been included in the predictive noise model as part of this assessment.

It is also noted that there are no major new operational noise sources are proposed as part of the approved Substation strategic development infrastructure development; therefore there is no requirement to add noise sources to the assessment for the Proposed Development for which this planning application relates to account for the Substation development.

Table 5.2: *A-weighted Sound Power Levels for Noise Sources included in Noise Model*

Noise Source[1]	Height of Noise Sources (m)	Octave Band Frequencies (Hz) and Sound Power Levels (dB(A)) per Band								
		63	125	250	500	1K	2K	4K	8K	L_{wA}
Air intake filter house	14.0	84	86	88	80	79	72	75	67	**91.8**
Gas turbine enclosure	3.0 / 1.5	79	89	88	93	94	89	86	83	**98.7**
GT enclosure vent fans (one in operation)	8.0	78	82	83	82	79	75	73	76	**88.8**
GT enclosure vent inlet	8.0	74	81	77	76	77	81	77	71	**86.8**
Generator (water cooled)	3.0 / 1.5	79	91	90	92	91	87	84	77	**97.8**
Gen enclosure vent outlet	6.0	45	58	47	47	48	47	52	45	**60.3**
Gen enclosure vent inlet	1.0	59	63	67	68	63	62	59	53	**72.7**
Exhaust duct	2.5	67	76	85	85	85	84	88	89	**94.3**
Lube oil cooler (water cooled)	2.0 / 1.0	53	64	71	77	81	79	72	70	**84.7**
Oil mist outlet	8.0	59	68	72	78	79	72	64	56	**82.7**
Liquid fuel unit	1.0	74	88	95	98	95	96	94	88	**103.1**
Water to air fin fan coolers	1.0	83	87.5	87.5	91	91	89	83	70	**96.9**
Stack outlet	25.0	81	93	90	96	95	85	78	72	**100.3**
Transformer [2]	1.0	77.1	88.5	82.9	76.2	66.1	53.8	40.3	25.7	**90.0**

Note 1: Data provided is for 1 no. OCGT Unit; there are 3 no. units proposed as part of the Proposed Development, and 3 no. units have been included in the Predictive Noise Model, with the exception of the Transformer Noise Source (refer to Note 2)

Note 2: There are 2 no. transformers proposed as part of the Proposed Development; therefore 2 no. point sources have been included in the Predictive Noise Model B

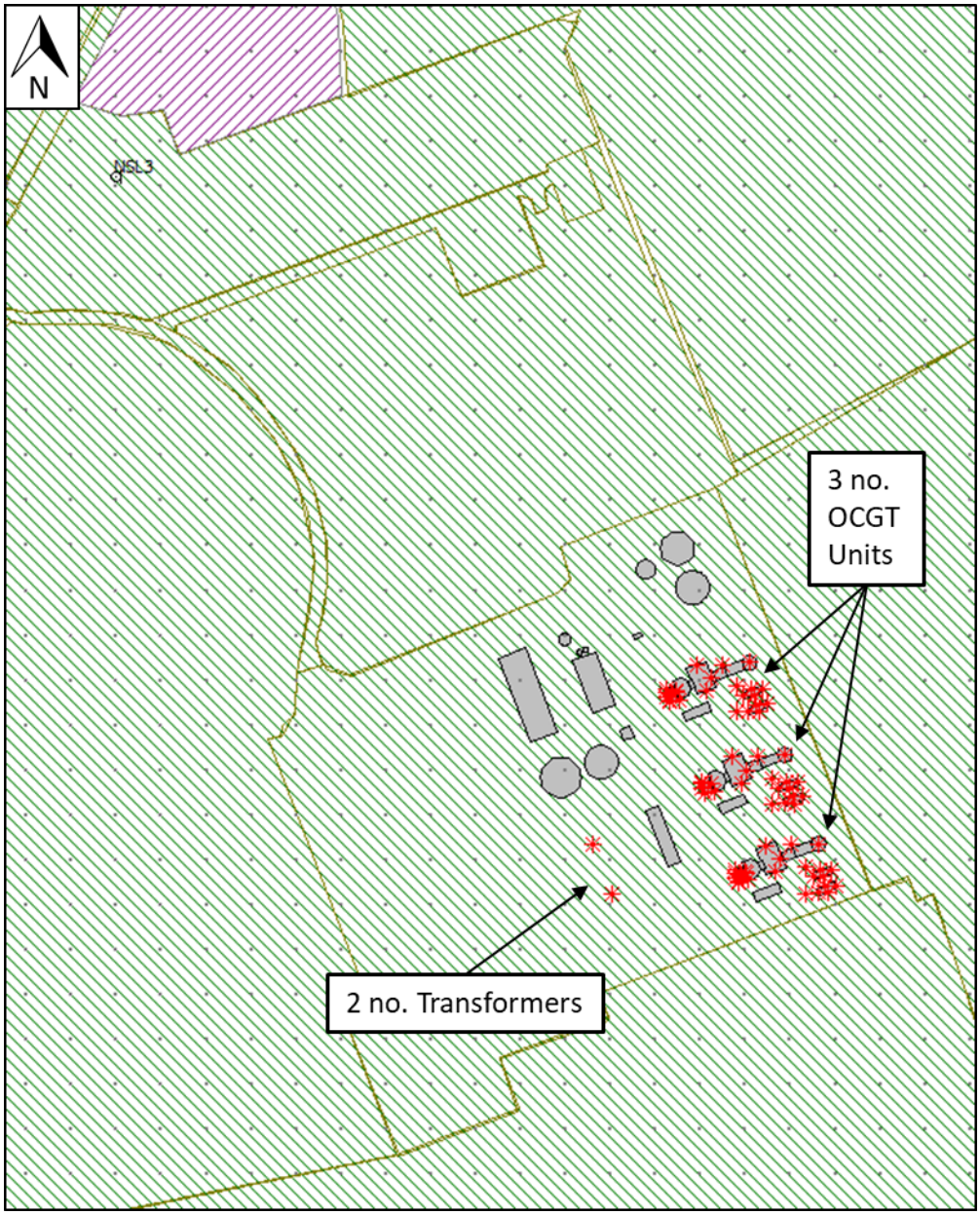

Figure 5.1: *Predictive Noise Model with 3 no. OCGT Units located in the South-Eastern Corner of the Site*

5.2.3 Prediction Calculation Results

The maximum predicted contribution from the operational phase of the Proposed Development at the NSLs under consideration in this assessment is presented in Table 5.3.

A contour plot of the maximum predicted contribution is provided in Figure 5.2 for a contour calculation height of 1.5m.

All results are rounded to the nearest 1dB.

Table 5.3: *Maximum Predicted Contribution from Proposed Development at the NSLs (Day, Evening and Night-time Operation)*

Noise Sensitive Location (NSL)	Maximum Predicted Contribution at NSL (dB(A))
NSL1 (at 1.5m)	40
NSL1 (at 4m)	42
NSL2 (at 1.5m)	42
NSL3 (at 1.5m)	44
NSL4 (at 1.5m)	38
NSL4 (at 4m)	40
NSL5 (at 1.5m)	35
NSL5 (at 4m)	37
NSL6 (at 1.5m)	44
NSL6 (at 4m)	45

As can be seen from Table 5.3, the maximum sound pressure level predicted at the NSLs included in this assessment will comply with the most stringent limit expected to be included in the Site's Industrial Emissions (IE) Licence of 45 dB(A) at night-time. As discussed previously the IE Licence limits are set by the EPA in order to negate the potential effects from noise.

It is further noted that there is a very low possibility of the facility operating at night (i.e. between the hours of 23.00 and 07.00) as these hours are outside peak electricity demand periods.

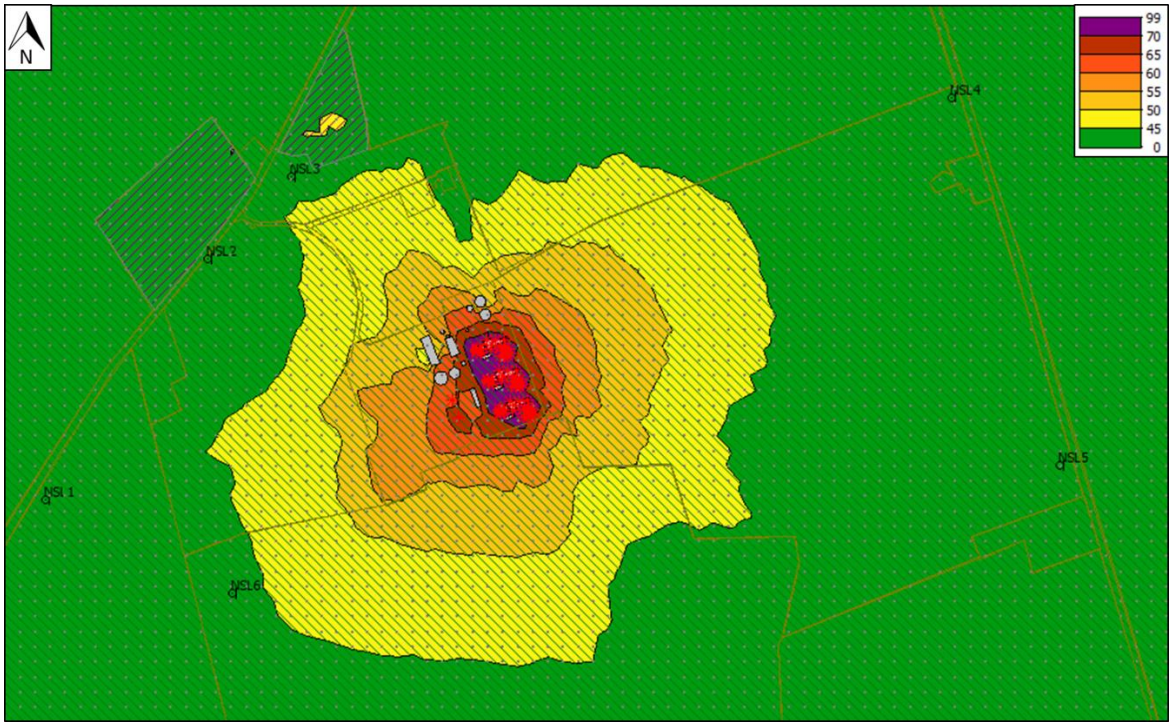

Figure 5.2: *Predicted Noise Contour Plot for the Proposed Noise Sources Associated with Proposed Development at a Receptor Height of 1.5m*

5.2.4 Cumulative Impacts

As described in Section 2.1.3, detailed noise impact assessments were completed as part of the EIA Reports (EIAR) submitted for the Irish Cement planning application (ABP Case Reference PL17.309308)[9], and the Indaver planning application (ABP Case Reference PA17.307433)[10]. A review of these EIARs has been completed, and the cumulative impacts of these developments with the Proposed Development to which this planning application relates has been completed in this section of the report as follows:

- ***Irish Cement (ABP Case Reference PL17.309308):*** The review of the EIAR for this development found that none of the receptors assessed as part of the Irish Cement development align with the receptors being assessed as part of this proposed SSE development.

  Of the receptors assessed as part of the Irish Cement development, the closest to the proposed SSE development is a receptor to the north of the Indaver facility (entitled NSL3 in the Irish Cement EIAR). In order to assess the Irish Cement development cumulatively with the proposed SSE development, the predicted sound pressure from the Irish Cement development at that receptor has been added to the sound pressure levels predicted by the proposed SSE development at all NSLs under consideration as part of this assessment. This is considered to be an extremely conservative approach given the fact that all NSLs under consideration as part of this assessment are at a greater distance from the Irish Cement site than NSL3 in the Irish Cement EIAR.

[9] Brady Shipman Martin (Nov 2020). Proposed Extension to Platin Overburden Management Facility (OBMF) Environmental Impact Assessment Report (EIAR) Volume 2. Available at: https://www.eplanning.ie/MeathCC/AppFileRefDetails/lb201629/0 [accessed May 2023]

[10] Arup (2020). Meath Waste-to-Energy Site Sustainability Project 2020 - Environmental Impact Assessment Report Vol 2: Main Text. Available at: https://www.pleanala.ie/en-ie/case/307433 [accessed June 2023]

It is noted that the Irish Cement assessment was carried out for daytime only; therefore the Irish Cement development is assessed cumulatively with the proposed SSE development for daytime only in Table 5.4.

- ***Indaver (ABP Case Reference PA17.307433):*** The review of the EIAR for this development found that there is some alignment between the receptors assessed as part of the Indaver development and the receptors being assessed as part of this proposed SSE development, as follows:

  - Receptor NSL-3 in the Indaver EIAR is very close to NSL2 for proposed SSE development
  - Receptor NSL-4 in the Indaver EIAR is very close to NSL1 for proposed SSE development
  - Receptor NSL-5 in the Indaver EIAR is very close to NSL3 for proposed SSE development

  For NSLs 1-3 for the proposed SSE development, the results of the assessment in the Indaver EIAR for the corresponding receptors as listed above have been used in order to cumulatively assess the Indaver development with the proposed SSE development.

  For the other receptors under consideration for the proposed SSE development, the following assumptions have been made:

  - The results for NSL-4 in the Indaver EIAR have been used to cumulatively assess the Indaver development with NSL6 for the proposed SSE development
  - The results for NSL-5 in the Indaver EIAR have been used to cumulatively assess the Indaver development with NSLs 4 and 5 for the proposed SSE development

  This is considered to be an extremely conservative approach given the fact that the SSE NSLs 4 and 5, and NSL6, are at a greater distance from the Indaver facility than NSL-5 and NSL-4 respectively, in the Indaver EIAR.

  It is noted that the Indaver assessment was carried out for daytime, evening time and night-time periods; therefore the Indaver development is assessed cumulatively with the proposed SSE development for these periods in Table 5.4, 5.5 and 5.6, respectively.

In addition, all existing noise sources in in the vicinity have been captured in the results of the baseline noise survey described in Section 4 of this report. 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 are provided in Tables 5.4-5.6 for the daytime, evening time and night-time periods.

Table 5.4: *Predicted Daytime Noise Levels at the NSLs*

Noise Sensitive Location (NSL)	Existing Daytime Noise Levels, L_{Aeq} (dB(A))	Maximum Predicted SSE Contribution at NSLs (dB(A))	Irish Cement (PL17.309308) Contribution (dB(A))	Indaver (PA17.307433) Contribution (dB(A))	Cumulative Noise Levels (dB(A))	Difference (dB(A))
NSL1 (at 1.5m)	79	40	40.5	31	79	0
NSL1 (at 4m)	79	42	40.5	31	79	0
NSL2 (at 1.5m)	67	42	40.5	30	67	0
NSL3 (at 1.5m)	64	44	40.5	26	64	0
NSL4 (at 1.5m)	64	38	40.5	26	64	0
NSL4 (at 4m)	64	40	40.5	26	64	0
NSL5 (at 1.5m)	64	35	40.5	26	64	0
NSL5 (at 4m)	64	37	40.5	26	64	0
NSL6 (at 1.5m)	79[1]	44	40.5	31	79	0
NSL6 (at 4m)	79[1]	45	40.5	31	79	0

Note 1: NSL6 was not accessible for monitoring therefore the noise data for the next nearest NSL, i.e. NSL1, is used as best available representative information for NSL6.

Table 5.5: *Predicted Evening Noise Levels at the NSLs*

Noise Sensitive Location (NSL)	Existing Daytime Noise Levels, L_{Aeq} (dB(A))	Maximum Predicted SSE Contribution at NSLs (dB(A))	Indaver (PA17.307433) Contribution (dB(A))	Cumulative Noise Levels (dB(A))	Difference (dB(A))
NSL1 (at 1.5m)	75	40	24	75	0
NSL1 (at 4m)	75	42	24	75	0
NSL2 (at 1.5m)	60	42	27	60	0
NSL3 (at 1.5m)	58	44	25	58	0
NSL4 (at 1.5m)	60	38	25	60	0
NSL4 (at 4m)	60	40	25	60	0
NSL5 (at 1.5m)	62	35	25	62	0
NSL5 (at 4m)	62	37	25	62	0
NSL6 (at 1.5m)	75[1]	44	24	75	0
NSL6 (at 4m)	75[1]	45	24	75	0

Note 1: NSL6 was not accessible for monitoring therefore the noise data for the next nearest NSL, i.e. NSL1, is used as best available representative information for NSL6.

Table 5.6: *Predicted Night-time Noise Levels at the NSLs*

Noise Sensitive Location (NSL)	Existing Daytime Noise Levels, L_{Aeq} (dB(A))	Maximum Predicted SSE Contribution at NSLs (dB(A))	Indaver (PA17.307433) Contribution (dB(A))	Cumulative Noise Levels (dB(A))	Difference (dB(A))
NSL1 (at 1.5m)	65	40	23	65	0
NSL1 (at 4m)	65	42	23	65	0
NSL2 (at 1.5m)	55	42	26	55	0
NSL3 (at 1.5m)	55	44	25	55	0
NSL4 (at 1.5m)	43	38	25	44	**+1**
NSL4 (at 4m)	43	40	25	45	**+2**
NSL5 (at 1.5m)	52	35	25	52	0
NSL5 (at 4m)	52	37	25	52	0
NSL6 (at 1.5m)	65[1]	44	23	65	0
NSL6 (at 4m)	65[1]	45	23	65	0

Note 1: NSL6 was not accessible for monitoring therefore the noise data for the next nearest NSL, i.e. NSL1, is used as best available representative information for NSL6.

Daytime

As can be seen from Table 5.4, the Proposed Development is not predicted to cause an increase in noise levels at any NSL when operational during the daytime period. It is noted that nearly all operational periods will occur during daytime hours (07.00-19.00) as peak demand periods generally occur within daytime hours.

A small amount of additional noise will be generated on Site periodically during the day as a result of site activity, delivery vehicles etc. However as can be seen from Table 5.4 the existing daytime noise levels at the nearest NSLs are far in excess of the predicted contribution from the fixed plant (at least 20 dB(A)). Therefore any small increase in noise levels from general site activity will not be perceptible. No out of hours activities (e.g. tanker deliveries, heavy maintenance) with a potential noise impact will be undertaken at the facility.

Evening Time

As can be seen from Table 5.5, the Proposed Development is not predicted to cause an increase in noise levels at any NSL when operational during the evening time period (19.00-23.00).

Night-time

As can be seen from Table 5.6, slight increases in noise levels are predicted at NSL4 in the night-time period (23.00-07.00), however with reference to Tables 2.1 and 2.2, it is considered that these increases will not be significant and will represent a negligible change.

It is further noted that there is a very low possibility of the facility operating at night (i.e. between the hours of 23.00 and 07.00) as these hours are outside peak electricity demand periods.

6 Mitigation Measures

6.1 Construction Phase

As outlined in Section 5.1, the construction phase of the Proposed Development will have the potential to cause a temporary increase in noise levels in the immediate vicinity of the development Site. However, as part of the construction contract the principal contractor will be obliged to minimise so far as is reasonably practicable the potential noise impact of the construction activity. Throughout the entire construction phase the standard *BS 5228-1:2009+A1:2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise* will be implemented, which offers detailed guidance on the control of noise from construction activities. In particular, the following practices be adopted during the construction phase:

- Control of Working Hours – Normal construction hours will be Monday to Friday 10 hours a day (08:00-18:00) with extended periods under stricter noise limits to 21:00hrs when required and approved, and a half day on Saturdays (08:00hrs-15:00hrs).
- Limiting the hours during which site activities that are likely to create high levels of noise or vibration are permitted.
- Channels of communication will be established between the Contractor / Developer, Local Authority, and residents.
- A site representative will be appointed who will be responsible for matters relating to noise.
- Noise levels will be monitored during critical periods and at sensitive locations.

Furthermore, following noise control measures will be employed:

- Selection of plant with low inherent potential for generation of noise and/or vibration;
- All construction equipment used will comply with the relevant regulations on plant and equipment noise, namely the *European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations, 1988 (SI No. 320 of 1988) as amended (SI No. 359 of 1996)* and the *European Communities (Noise Emission by Equipment of Use Outdoors) Regulations, 2001 (SI No. 632 of 2001), as amended (SI No. 241 of 2006)*;
- All plant and equipment will undergo regular maintenance in accordance with manufacturer recommendations, be switched off if not in use, and be appropriately fitted with silencers or contained in acoustic enclosures as necessary;
- Minimisation of impulsive noise sources and activities, including reduction of material drop heights, minimising hammering activities 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 barriers as necessary around noisy processes and items such as generators, heavy mechanical plant or high duty compressors;
- Keeping all Site access roads even so as to mitigate the potential for vibration from lorries.

6.2 Operational Phase

An Industrial Emissions Licence application will be submitted to the EPA following the granting of planning permission. This licence will be granted prior to operation of the OGCT plant. 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;
- Restricting any specific noisy activities which could impact on ambient noise levels (e.g. heavy goods deliveries, heavy maintenance) to daytime hours only;
- Periodic noise monitoring will be carried out in accordance with the Site's Industrial Emissions Licence, when granted.

7 Residual Impacts

With the employment of the mitigation measures as detailed above for the operational phase, and given the temporary nature and mitigation measures detailed for the construction phase, it is not expected that the Proposed Development will not have any significant adverse residual impact on the local environment during the construction or operational phases.

Attachment 1

Calibration Certs for Noise Meter and Calibrator

SONITUS SYSTEMS

Statement of Calibration

Issued to:	Calibration Reference
PM Group Killakee House Belgard Square Tallaght Dublin 24	SLM221068

Test Date: 06/07/2022
Procedure: TP-SLM-1

Equipment

Item Calibrated:	Sound Level Meter	**Model**	Type 2250-L
Make:	Bruel & Kjaer	**Serial Number:**	3008813

Calibration Procedure

The sound level meter was allowed to stabilize for a suitable period, as described in the manufacturer's instruction manual, in laboratory conditions. The sound level meter was calibrated by carrying out the verification tests detailed in IEC 61672-3 (2006), Periodic tests, specification of sound level meters. Tolerances for verification procedures are specified in IEC 61672-1 (2003).

Calibration Standards

Description	Serial Number
National Instruments PXI-4461	19C91D2
Stanford Research DS360	123803
GRAS 42AA Pistonphone	227947
GRAS 46A0 Pressure Field Microphone	228216

The standards used in this calibration are traceable to NIST and/or other National Measurement Institutes (NMI's) that are signatories of the International Committee of Weights and Measures (CIPM) mutual recognition agreement (MRA).

Signed on behalf of Sonitus Systems:

SONITUS SYSTEMS

Calibration Report

Equipment Description

Model:	Bruel & Kjaer	**Serial Number:**	3008813
Model:	Type 2250-L	**Microphone Model:**	Bruel & Kjaer 4950

Ambient Conditions

Measurement conditions were within the tolerances defined in IEC 61672-1 and IEC 60942.

Barometric Pressure:	1030 hPa
Temperature:	24 °C
Relative Humidity:	54 %

Results Summary

IEC 61672 Test #	Test Description	Result
10	Self-generated noise	-
11	Frequency weighting (acoustical)	PASS
12	Frequency weighting (electrical)	PASS
13	Frequency and time weighting (1kHz)	PASS
14	Level linearity on reference level range	PASS
15	Level linearity with level range control	-
16	Toneburst response	PASS
17	Peak C sound level	PASS
18	Overload indication	PASS

As public evidence was available, from a testing organization responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound level meter fully conformed to the requirements for pattern evaluation described in IEC 61672:2003, the sound level meter tested is considered to conform to all the Class 1 requirements of IEC 61672:2003

The manufacturer's guidelines concerning appropriate set up for measurement under various conditions should be observed during usage.

Prior to carrying out the verification tests the sound level meter was adjusted to read correctly using the customer's acoustic calibrator (B&K Type 4231, Serial number: 2229913). The calibration procedure is described in the manufacturer's instruction manual.

Self-generated noise - IEC 61672-3 Test #10
SLM Measuring Mode: Leq

SLM Configuration	Freq. Weighting Network	SLM Reading
Microphone Installed	A	21.7
Microphone replaced by electrical input device fitted with short circuit	A	14.7
	C	16.8
	Z	21.4

Acoustical signal test of a frequency weighting - IEC 61672-3 Test #11
Range: reference level range
Frequency Weighting: C
Time Weighting: Slow

Input	Freq	Expected Level	Deviation	Tol +/-
94 dB	1000 Hz	94.0	0.0	1.0
	125 Hz	93.8	0.3	1.0
	4000 Hz	93.3	0.0	1.0

The frequency response was tested using an electrostatic actuator. Appropriate correction factors were applied as detailed in the manufacturer's instruction manual.

Electrical tests of frequency weighting - IEC 61672-3 Test #12
Range: reference level range

A-weighting

Freq	Expected Level	SLM Reading	Deviation	Tol +	Tol -
63	95.0	94.9	-0.1	1.5	-1.5
125	95.0	94.9	-0.1	1.5	-1.5
250	95.0	94.9	-0.1	1.4	-1.4
500	95.0	94.9	-0.1	1.4	-1.4
1000	95.0	95.0	0.0	1.1	-1.1
2000	95.0	95.0	0.0	1.6	-1.6
4000	95.0	94.9	-0.1	1.6	-1.6
8000	95.0	94.6	-0.4	2.1	-3.1
16000	95.0	95.5	0.5	3.5	-17.0

C-weighting

Freq	Expected Level	SLM Reading	Deviation	Tol +	Tol -
63	95.0	94.9	-0.1	1.5	-1.5
125	95.0	95.3	0.3	1.5	-1.5
250	95.0	95.0	0.0	1.4	-1.4
500	95.0	95.0	0.0	1.4	-1.4
1000	95.0	95.0	0.0	1.1	-1.1
2000	95.0	95.0	0.0	1.6	-1.6
4000	95.0	94.9	-0.1	1.6	-1.6
8000	95.0	94.6	-0.4	2.1	-3.1
16000	95.0	95.5	0.5	3.5	-17.0

Linear

Freq	Expected Level	SLM Reading	Deviation	Tol +	Tol -
63	95.0	94.9	-0.1	1.5	-1.5
125	95.0	95.0	0.0	1.5	-1.5
250	95.0	95.0	0.0	1.4	-1.4
500	95.0	94.9	-0.1	1.4	-1.4
1000	95.0	95.0	0.0	1.1	-1.1
2000	95.0	95.0	0.0	1.6	-1.6
4000	95.0	94.9	-0.1	1.6	-1.6
8000	95.0	94.7	-0.3	2.1	-3.1
16000	95.0	95.6	0.6	3.5	-17.0

Frequency and Time Weightings at 1 kHz IEC 61672-3 Test #13
Range: reference level range

Time Weighting	Freq. Weighting	Expected Level	Deviation	Tol +/-
Fast	A	94.0	ref	
	C	94.0	0.0	0.2
Slow	A	94.0	0.0	0.2
LEQ	A	94.0	0.0	0.2

Linearity level on reference range - IEC 61672-3 Test #14
Input frequency: 8 kHz
SLM Measuring Mode: SPL

Range	Expected Level	SLM Reading	Deviation	Tol +/-
123 dB	94.0	94.0	0.0	1.1
	99.0	99.0	0.0	1.1
	104.0	104.0	0.0	1.1
	109.0	109.0	0.0	1.1
	114.0	114.0	0.0	1.1
	119.0	119.0	0.0	1.1
	124.0	124.1	0.1	1.1
	129.0	129.1	0.1	1.1
	134.0	134.1	0.1	1.1
	135.0	135.1	0.1	1.1
	136.0	136.1	0.1	1.1
	137.0	137.1	0.1	1.1
	138.0	138.1	0.1	1.1
	139.0	139.1	0.1	1.1
	140.0	140.1	0.1	1.1
	89.0	89.1	0.1	1.1
	84.0	84.1	0.1	1.1
	79.0	79.1	0.1	1.1
	74.0	74.1	0.1	1.1
	69.0	69.1	0.1	1.1
	64.0	64.1	0.1	1.1
	59.0	59.0	0.0	1.1
	54.0	54.1	0.1	1.1
	49.0	49.1	0.1	1.1
	44.0	44.1	0.1	1.1
	39.0	39.1	0.1	1.1
	34.0	34.1	0.1	1.1
	29.0	29.2	0.2	1.1
	28.0	28.4	0.4	1.1
	27.0	27.3	0.3	1.1
	26.0	26.4	0.4	1.1
	25.0	25.4	0.4	1.1

Toneburst response - IEC 61672-3 Test #16
Range: reference level range

Burst Type	Response	Expected Level	SLM Reading	Deviation	Tol +	Tol -
0.25 ms	LAFMAX	111.0	110.8	-0.2	0.8	-0.8
2.0 ms	LAFMAX	120.0	119.9	-0.1	1.3	-1.3
200 ms	LAFMAX	137.0	137.0	0.0	1.3	-3.3
2.0 ms	LASMAX	111.0	111.0	0.0	0.8	-0.8
200 ms	LASMAX	130.6	130.5	-0.1	1.3	-3.3

Peak C sound level - IEC 61672-3 Test #17
Range: reference level range

Pulse Type	Freq	Expected Level	SLM Reading	Deviation	Tol +/-
1 cycle	8 kHz	135.4	135.7	0.3	2.4
Pos ½ cycle	500 Hz	137.4	137.1	-0.3	1.4
Neg ½ cycle	500 Hz	137.4	137.1	-0.3	1.4

Overload indication IEC 61672-3 Test #18

Test Description	Overload at	Meas. Diff. (Pos – Neg)	Tol +/-
Pos. ½ cycle at 4 kHz	144.6		
Neg. ½ cycle at 4 kHz	144.6		
Level difference		0.0	1.8

Calibration Notes

1. The manufacturer's instruction manual was accessed through the manufacturer's website
2. The sound level meter was powered by internal batteries

SONITUS SYSTEMS

Certificate of Calibration

Issued to:	Certificate Number
PM Group Kilakee House Belgard Square Tallaght Dublin 24	AC220169

Test Date: 06/07/2022
Procedure: TP-ACOCAL-1

Equipment Information

Item Calibrated:	Acoustic Calibrator	**Model:**	Type 4231
Make:	Bruel & Kjaer	**Serial Number:**	2229913

Calibration Procedure

The above calibrator was verified in line with the requirements of BS EN 60942:2003. The calibrator was allowed to stablize for a suitable period, as described in the manufacturer's instruction manual, in laboratory conditions. The sound pressure level in the cavity (half-inch) was measured. The operating frequency and signal distortion were also measured.

Calibration Standards

Description	Serial Number
National Instruments PXI-4461	19C91D2
GRAS 42AA Pistonphone	227947
GRAS 46A0 Pressure Field Microphone	228216

The standards used in this calibration are traceable to NIST and/or other National Measurement Institutes (NMI's) that are signatories of the International Committee of Weights and Measures (CIPM) mutual recognition agreement (MRA).

Signed on behalf of Sonitus Systems:

SONITUS SYSTEMS

Calibration Report

Equipment Information

Model: Type 4231
Serial Number: 2229913

Ambient Conditions

Measurement conditions were within the tolerances defined in BS EN 60942.

Barometric Pressure:	1030 hPa
Temperature:	23.0 °C
Relative Humidity:	58 %

Results

Calibrator Setting	Measured Parameter	Measured Value	Tolerance +/-	Uncertainty +/-
94 dB, 1kHz	Sound pressure level (dB)	93.72	0.4 dB	0.14 dB
	Frequency (Hz)	999.99	10 Hz	0.25 Hz
	Distortion (%)	0.24	3.0 %	0.3 %
114 dB, 1kHz	Sound pressure level (dB)	113.72	0.4 dB	0.14 dB
	Frequency (Hz)	999.99	10 Hz	0.25 Hz
	Distortion (%)	0.15	3.0 %	0.3 %

RESULT: PASS

As public evidence was available, from a testing organization responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the Class 1 requirements of IEC 60942:2003

The manufacturer's guidelines concerning free-field correction should be observed when using the calibrator.

Notes

1. All measurements were made with the half-inch configuration of the calibrator in place.
2. The measurement uncertainty is reported as a standard uncertainty multiplied by a coverage factor k=2 which, for a normal probabbility distribution, corresponds to a coverage probability of approximately 95%.
3. The given uncertainty corresponds to measured values only and does not relate to the long term stability of the device under test.
4. The user manual for the device under test was obtained from the manufacturer's website.

Attachment 3
Geophysical Survey Report

GEOPHYSICAL SURVEY

REPORT

Carranstown,

County Meath

Date:
06/12/2018

Licence: 18R0231

J. M. Leigh Surveys Ltd.
124 Oaklawn West
Leixlip
County Kildare
www.jmlsurveys.com
01 615 4647

J. M. Leigh Surveys Ltd.
124 Oaklawn West,
Leixlip, Co. Kildare
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Mobile: 0879062729
www.jmlsurveys.com

GEOPHYSICAL SURVEY SUMMARY SHEET
CARRANSTOWN, COUNTY MEATH

Site Name	Carranstown Co. Meath	**Ref No.**	18053
Townland	Caulstown	**Licence No.**	18-R-0231
County	Meath	**Licence Holder**	Joanna Leigh
ITM (centre)	E706643, N770750	**Purpose**	Pre-planning investigation
Client	IAC Ltd.	**Reference No.**	N/A

Closest RMP	ME027:078	**Classification**	Embanked Enclosure
ITM	E706480, N770749	**Location**	To the immediate west of the application area. Monument detected through LiDAR image.
Townland	Caulstown		

Ground Conditions	Survey ground conditions were excellent, comprising of short pasture.
Survey Type	Detailed gradiometer survey totalling c.12 hectare

Summary of Results

The possible remains of two enclosures have been identified. The northern most enclosure has a D-shape with an area of possible burnt material to its south. The second probable enclosure is less well defined, suggesting significant plough damage.

In addition to the two probable enclosures, numerous isolated responses suggest large pit-type features, although it is possible these are natural in origin. Interpretation is cautious.

Spreads of amorphous responses may represent the remains of burnt spreads or burnt material and are considered to be of archaeological potential.

No responses corresponding with the recorded embanked enclosure (ME 027:078) were identified.

Fieldwork Staff	Joanna Leigh and Susan Curran

Report Date	06/12/2018	**Report Author**	Joanna Leigh

Contents

1. Introduction 1

2. Survey ground conditions and further information 1

3. Survey Methodology 2

4. Data Display 2

5. Survey Results 3

6. Conclusion 5

Geophysical Survey Report
Carranstown, Duleek, Co. Meath

1 Introduction

1.1 A geophysical survey has been conducted by J. M. Leigh Surveys at a site in the townland of Caulstown, Co. Meath. The survey has been requested as part of a wider archaeological study by IAC Ltd., on behalf of Platin Power Ltd., and is a pre-planning investigation.

1.2 The application area is contained within a single large (c12ha) field to the south of the R152, to the north-east of Duleek, County Meath. Figure 1 is a location diagram of the application area at a scale of 1:4,000.

1.3 There is a recorded redundant record (ME027:079) located within the application area. This was previously identified as the location of an enclosure site but is now recorded as redundant. LiDAR data has identified the location of an embanked enclosure to the west of this, which appears to extend into the current application area. The LiDAR data suggest a large circular enclosure (int. diam. c. 120m; ext. diam. c. 200m) defined by a broad bank feature (Width c. 30m-40m). The location of the feature (ME027: 078) identified by the LiDAR data is presented in Figure 1.

1.4 The main aim of the survey was to identify any geophysical responses within the predefined survey area that may represent unknown archaeological features and to identify any responses indicating the nature and extent of the feature identified in the LiDAR data. A detailed gradiometer survey was conducted under licence 18R0231 issued by the Department of Culture, Heritage and the Gaeltacht.

2 Survey ground conditions and further information

2.1 The survey ground conditions were good at the time of survey, comprising of short pasture.

2.2 Hay bales were scattered throughout the field but did not pose a problem for data collection.

3 Survey Methodology

3.1 A detailed gradiometer survey detects subtle variations in the local magnetic field and measurements are recorded in nano-Tesla (nT). Some archaeological features such as ditches, large pits and fired features have an enhanced magnetic signal and can be detected through recorded survey.

3.2 Data was collected with a Bartington Grad 601-2 instrument. This is a specifically designed gradiometer for use in archaeological prospection. The gradiometer operates with a dual sensor capacity making survey fast and effective.

3.3 The instrument is calibrated in the field to ensure a constant high quality of data. Extremely sensitive, these instruments can detect variations in soil magnetism to 0.01nT, affording diverse application throughout a variety of archaeological, soil morphological and geological conditions.

3.4 All data was collected in 'zigzag' traverses. Grid orientation remained constant throughout each field to facilitate the data display and interpretation.

3.5 Data was collected with a sample interval of 0.25m and a traverse interval of 1m, providing 6400 readings per 40m x 40m grid. The survey grid was set-out using a GPS VRS unit. Survey tie-in information is available upon request.

3.6 The survey methodology, data presentation and report content adheres to the European Archaeological Council (EAC) (2016) '*Guidelines for the use of Geophysics in Archaeology*'.

4 Data display

4.1 A summary greyscale image is presented in Figure 2 at a scale of 1:1,500.

4.2 An accompanying summary interpretation diagram is presented in Figure 3, also at a scale of 1:1,500.

4.3 Isolated ferrous responses highlighted in the interpretation diagram most likely represent modern ferrous litter and debris and are not of archaeological interest. These are not discussed in the text unless considered relevant.

4.4 Numbers in parenthesis in the text refer to specific responses highlighted in the interpretation diagrams.

4.5 The raw gradiometer data is presented in archive format in Appendix A1.01 and A1.02. The raw data is displayed as a greyscale image and xy-trace plot. The archive

plots are used to aid interpretation of the results, are used for reference only and are available upon request.

4.6 The display formats referred to above and the interpretation categories are discussed in the summary technical information section at the end of this report.

5 Survey Results

5.1 The magnetic background response appears to vary throughout the field. In the south of the data there is a general low level of background response with numerous broad amorphous spreads (1). The amorphous spreads have no clear pattern or form and are most likely natural in origin, perhaps representing shallow sands and gravels.

5.2 The northern half of the data presents a higher level of background variation, with numerous modern ferrous responses across the data set. The natural responses (1) appear to peter out, and are not present in the northern half of the field.

5.3 Although the background responses appear to vary across the data set, responses of clear archaeological potential have been recorded.

5.4 A fragmented series of responses and trends (2) are typically of archaeological ditch-type features and form a 'D' shaped pattern. This is interpreted as the remains of a probable enclosure, measuring 27m x 23m. The fragmented nature of the responses suggest some plough damage has occurred. There are no clear responses within the probable enclosure.

5.5 To the immediate south of the probable enclosure are a spread of responses (3). Although there is no clear pattern, the responses may represent a spread of burnt material associated with the probable D-shaped enclosure. Interpretation is cautious but (3) is considered to be of archaeological potential.

5.6 Another series of fragmented responses (4) forms a curvilinear pattern indicative of an archaeological ditch-type feature. Although the responses are less clear than (2), it is speculated that the plough damaged remains of a 2nd enclosure have been recorded.

5.7 A linear trend (5) forms the western extent of the enclosure (4) and appears to extend to the south.

5.8 South of (4) and (5) there are multiple isolated responses with a magnetic signature suggestive of pit-type features. However, given the presence of natural responses

in the south of the field, some of these responses may also be natural in origin. Nevertheless, some responses (6) have a clear magnetic signature typical of archaeology. Although interpretation is tentative, the isolated responses (6) are considered to be of archaeological potential.

5.9 In the south of the data there is a broad curvilinear trend (7). Although it is possible that this represents the plough damaged remains of a large curving ditch-type feature, interpretation is tentative. It is considered more likely that this represents further natural variations within the sub-soil, similar to the responses (1).

5.10 Two areas of amorphous responses (8) are located in the northern half of the survey. Although these have no clear form, they are suggestive of areas of burnt material. While it is possible that modern ground disturbance is represented here, an archaeological interpretation must be considered. The responses (8) may represent the remains of burnt spreads or burnt mounds of archaeological origin.

5.11 Another area of amorphous responses (9) is similar in form to (8). However, there are some responses and trends within this that exhibit a linear form. Although no clear archaeological pattern is evident, it is possible that plough damaged archaeological remains are represented here.

5.12 A broad ferrous response and area of magnetic disturbance along the northern extent of survey results from a modern service pipe.

6 Conclusion

6.1 Natural amorphous responses are prominent in the south of the data set, with numerous modern ferrous responses in the north. Although the data has a varied background response, clear responses of interest have been identified.

6.2 The possible remains of two enclosures have been identified. The northern most enclosure has a D-shape with an area of possible burnt material to the south. The second probable enclosure is less clear in the data, suggesting significant plough damage.

6.3 In addition to the two possible enclosures, numerous isolated responses suggest large pit-type features, although it is possible these are in fact natural in origin. Interpretation is unclear.

6.4 Spreads of amorphous responses may result from more recent ground disturbance. However, it is equally possible that the remains of burnt spreads have been identified.

6.5 Although responses of clear archaeological potential were identified in the survey, there are no responses consistent with the recorded embanked enclosure (ME 027:078) which, given the LiDAR image, should extend into the survey area. Test trench investigation may be required to establish the extent of the recorded embanked enclosure.

6.6 Consultation with a licensed archaeologist and with the Department of Culture, Heritage and the Gaeltacht is recommended to establish if any additional archaeological works, such as test trench investigation, may be required to establish the nature of the responses highlighted in this report.

Technical Information Section

Instrumentation & Methodology

Detailed Gradiometer Survey

This is conducted to clearly define any responses detected during scanning, or can be applied as a stand-alone methodology. Detailed survey is often applied with a sample interval of 0.25m and a traverse interval of 1m. This allows detection of potential archaeological responses. Data is collected in grids 40m x 40m, and data is displayed accordingly. A more detailed survey methodology may be applied where archaeological remains are thought likely. A survey with a grid size of 10m x 10m and a traverse interval of 0.5m will provide a data set with high resolution.

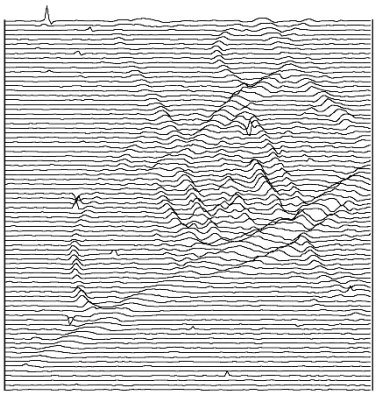
Bartington GRAD 601-2

The Bartington Grad 601-2 instrument is a specifically designed gradiometer for use in archaeological prospection. The gradiometer operates with a dual sensor capacity making survey very fast and effective. The sensors have a separation of 1m allowing greater sensitivity.

Frequent realignment of the instruments and zero drift correction; ensure a constant high quality of data. Extremely sensitive, these instruments can detect variations in soil magnetism to 0.1nT, affording diverse application throughout a variety of archaeological, soil morphological and geological conditions.

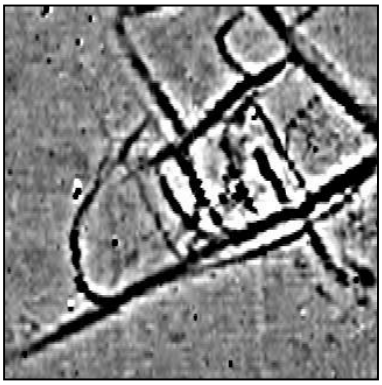
Gradiometer Data Display & Presentation

XY Trace



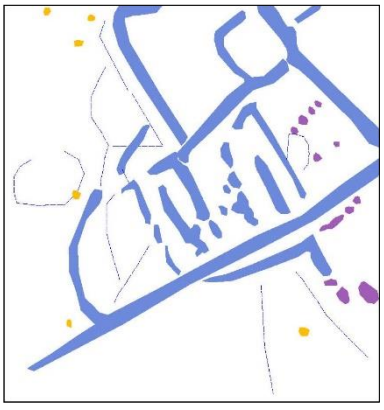
The data are presented as a series of linear traces, enabling a semi-profile display of the respective anomalies along the X and Y-axes. This display option is essential for distinguishing between modern ferrous materials (buried metal debris) and potential archaeological responses. The XY trace plot provides a linear display of the magnitude of the response within a given data set.

*Greyscale**



As with dot density plots, the greyscale format assigns a cell to each datum according to its location on the grid. The display of each data point is conducted at very fine increments, allowing the full range of values to be displayed within the given data set. This display method also enables the identification of discrete responses that may be at the limits of instrument detection. In the summary diagrams processed, interpolated data is presented. Raw un-interpolated data is presented in the archive drawings along with the xy-trace plots.

Interpretation



An interpretation of the data is made using many of the plots presented in the final report, in addition to examination of the raw and processed data. The project managers' knowledge and experience allows a detailed interpretation of the survey results with respect to archaeological potential.

**XY Trace and raw greyscale plots are presented in archive form for display of the raw survey data. Summary greyscale images of the interpolated data are included for presentation purposes and to assist interpretation.*

Glossary of Interpretation Terms

Archaeology

This category refers to responses which are interpreted as of clear archaeological potential, and are supported by further archaeological evidence such as aerial photography or excavation. The term is generally associated with significant concentrations of former settlement, such as ditched enclosures, storage pits and associated features.

? Archaeology

This term corresponds to anomalies that display typical archaeological patterns where no record of comparative archaeological evidence is available. In some cases, it may prove difficult to distinguish between these and evidence of more recent activity also visible in the data.

? Industrial

Such anomalies generally possess a strong magnetic response and may equate with archaeological features such as kilns, furnaces, concentrations of fired debris and associated industrial material.

Area of Increased Magnetic Response

These responses often lack any distinctive archaeological form, and it is therefore difficult to assign any specific interpretation. The resulting responses are site specific, possibly associated with concentrations of archaeological debris or more recent disturbance to underlying archaeological features.

Trend

This category refers to low-level magnetic responses barely visible above the magnetic background of the soil. Interpretation is tentative, as these anomalies are often at the limits of instrument detection.

Ploughing/Ridge & Furrow

Visible as a series of linear responses, these anomalies equate with recent or archaeological cultivation activity.

? Natural

A broad response resulting from localised natural variations in the magnetic background of the subsoil; presenting as broad amorphous responses most likely resulting from geological features.

Ferrous Response

These anomalies exhibit a typically strong magnetic response, often referred to as ‘iron spikes,’ and are the result of modern metal debris located within the topsoil.

Area of Magnetic Disturbance

This term refers to large-scale magnetic interference from existing services or structures. The extent of this interference may in some cases obscure anomalies of potential archaeological interest.

Bibliography

European Archaeological Council (EAC) (2015) '*Guidelines for the use of Geophysics in Archaeology*' by Armin Schmidt, Paul Linford, Neil Linford, Andrew David, Chris Gaffney, Apostolos Sarris and Jörg Fassbinder.

English Heritage (2008) '*Geophysical guidelines: Geophysical Survey in Archaeological Field Evaluation*.' Second Edition.

Gaffney, C. Gater, J. & Ovenden, S. (2006) '*The use of Geophysical Techniques in Archaeological Evaluations.*' IFA Paper No. 6.

Gaffney, C & Gater, J (2003). '*Revealing the buried past: Geophysics for Archaeologists*.' Tempus Publishing Limited.

National Soil Survey of Ireland (1980) *General soil map second edition (1:575,000)*. An Foras Taluntais.

List of Figures

Figure	Description	Paper Size	Scale
Figure 1	Site & Survey Location Diagram	A4P	1:4,000
Figure 2	Summary Greyscale Image	A3P	1:1,500
Figure 3	Summary Interpretation Image	A3P	1:1,500

Archive Plots available as PDF's upon request

A1.01	Raw data Greyscale Image	A0P	1:500
A1.02	Raw data XY-Trace Plot	A0P	1:500

Application Area

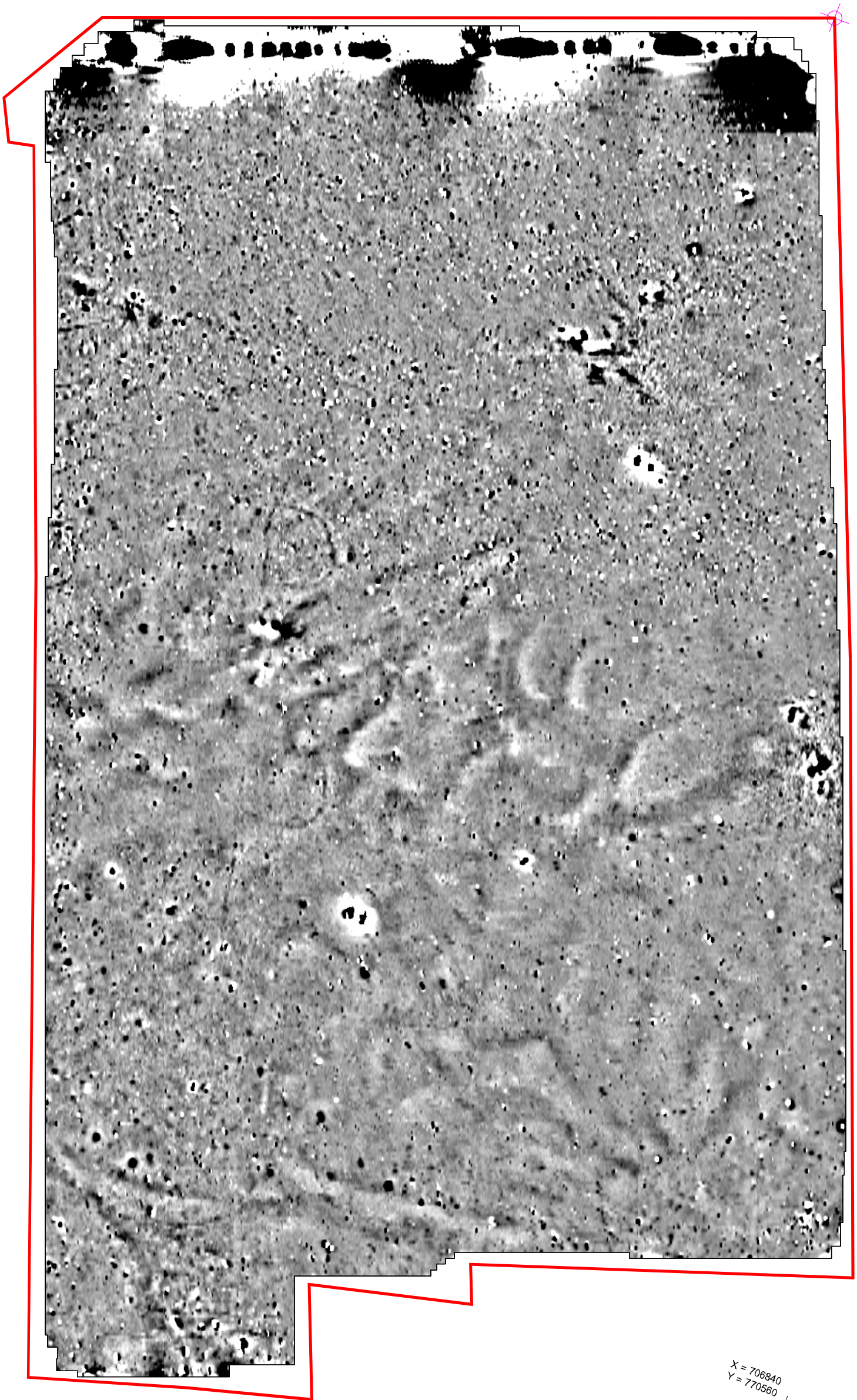
Detailed gradiometer survey

Feature identified in Lidar image
ME027:078 Embanked Enclosure

0 metres 160

Client: IAC Ltd.	Project: Geophysical Survey Carranstown, County Meath	Title: Site & Survey Location	J.M.Leigh surveys www.jmlsurveys.com

Scale @ A4: 1:4,000
Figure: 1
Licence No.: 18R0231
Issue Date: 06.12.2018



Client: IAC Ltd.	Project: Geophysical Survey Carranstown, County Meath	Title: Summary Greyscale Image	J.M.Leigh surveys www.jmlsurveys.com	Scale @ A3: 1:1,500 Figure: 2 Licence No.: 18R0231 Issue Date: 06.12.2018

X = 706400
Y = 770880

ME027:078

ME027:079

X = 706500
Y = 770580

X = 706840
Y = 770560

?Archaeology

Trend

Area of increased magnetic response

Natural

Modern Magnetic disturbance

Modern Ferrous response

0 metres 60

Client: IAC Ltd.	Project: Geophysical Survey Carranstown, County Meath	Title: Summary Interpretation	J.M.Leigh surveys www.jmlsurveys.com	Scale @ A3: 1:1,500 Figure: 3 Licence No.: 18R0231 Issue Date: 06.12.2018	

Attachment 4

Air Dispersion Modelling Report

Air Dispersion Modelling Report 2023

SSE Generation Ireland Ltd
Planning Support
IE0312377-22-RP-0019, Issue: A

Issue date: 14 Jul 2023

Document Sign Off

Air Dispersion Modelling Report 2023

SSE Generation Ireland Ltd
Planning Support
IE0312377-22-RP-0019, Issue A

File No:IE0312377.22.160

CURRENT ISSUE					
Issue No: A	Date: 14 Jul 2023	Reason for issue: Information			
Sign Off	Originator	Checker	Reviewer	Approver	Customer Approval (if required)
Print Name	Julia Carroll	AINE.MONAGHAN		PAUL.OSULLIVAN	
Signature	**Authorised Electronically**				
Date	14 July 2023	14 Jul 2023		14 Jul 2023	

PREVIOUS ISSUES							
Issue No	Date	Originator	Checker	Reviewer	Approver	Customer	Reason for issue

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Executive Summary

SSE proposes to install an Open Cycle Gas Turbine (OCGT) Generating Plant at its site in Carranstown, Duleek, Platin, Co. Meath. The proposed plant will have a capacity up to 170MW (electrical output), which is designed to support the national electricity network and to operate during peak demand periods. The proposed plant will be a Hydrotreated Vegetable Oil (HVO) fired electrical power generating facility.

The purpose of this air dispersion modelling report was to assess whether the emissions to air from the proposed development would cause a contravention of applicable European and Irish Air Quality Standards (AQSs).

The assessment was carried out using BREEZE air dispersion modelling software (version 9.2.0.4), which implements US EPA AERMOD software version 19191. 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 all emission points to air on-site. Using this input data, the model predicts ambient ground level concentrations 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. The modelling and reporting methodology was carried out based on the Irish Environmental Protection Agency (EPA) *Air Dispersion Modelling from Industrial Installations Guidance Note* (AG4)(2020).

The following modelling scenario was considered in this air dispersion modelling assessment:

- 3 No. HVO fuelled Open Cycle Gas Turbine (OCGT) units with 3 No. emission points included in the model, as each turbine has its own emission stack.

The turbine units will operate a maximum of 1,800 hours annually with the highest demand occurring during the winter months. However, continuous operation 24 hours a day, 7 days a week was included in the air dispersion modelling as a conservative approach. In addition, relevant emission stacks from the nearby Industrial Emission (IE) licensed facilities, namely Indaver Ireland Ltd. and Irish Cement Ltd., were included in the air dispersion model to allow for a cumulative assessment of emissions.

The maximum predicted ground level concentrations (GLCs) of nitrogen dioxide (NO_2), sulphur dioxide (SO_2), carbon monoxide (CO), particulates ($PM_{10/2.5}$) and ammonia (NH_3) from the models were compared against the relevant European and Irish Air Quality Standard (AQS) and Environmental Assessment Level (EAL) limit values to assess the impact of atmospheric emissions from the proposed development on ambient air quality.

Results from the modelling assessment show that atmospheric emissions due to the proposed development do not result in ground level concentrations of NO_2, SO_2, CO, $PM_{10/2.5}$ and NH_3 exceeding the relevant AQSs and EALs for the protection of human health and the environment.

It is therefore concluded that atmospheric emissions from the proposed development will have no significant impact on ambient air quality.

1 Introduction

1.1 General

Air dispersion modelling has been carried out to assess the potential environmental impact of atmospheric emissions from the proposed development at the SSE site in Carranstown, Platin, Duleek, Co. Meath. The proposed development is an Open Cycle Gas Turbine (OCGT) Plant with a capacity up to 170MW (electrical output), which is designed to support the national electricity network and to operate during peak demand periods. The proposed plant will be a Hydrotreated Vegetable Oil (HVO) fired electrical power generating facility.

The plant design will allow for flexible operation so the plant can cater for high demand and respond quickly to fluctuations on the electricity grid. Operation over extended periods is not foreseen. The running regime, in terms of load and runtime, will depend on the size of the peak load experienced. It is anticipated that the plant will operate a maximum of 1,800 hours per year with the highest expected demand during winter months. However, a 24/7 operation was included in the air dispersion modelling as a conservative approach.

The currently green-field site location is located is approximately 4.5 km south-west of Drogheda town centre (Figure 1-1).

The purpose of the modelling was to ensure that atmospheric emissions from the proposed development do not cause a contravention of applicable European and Irish Air Quality Standards (AQSs). The modelling assessment was carried out using BREEZE air dispersion modelling software (version 9.2.0.4), which implements US EPA AERMOD software version 19191.

All emissions data for the proposed development has been provided by the SSE design team. Building and tank dimensions were taken from project drawings together with an electronic site plan imported into BREEZE AERMOD.

The maximum predicted ground level concentrations (GLCs) of nitrogen dioxide (NO_2), sulphur dioxide (SO_2), carbon monoxide (CO), particulates ($PM_{10/2.5}$) and ammonia (NH_3) were compared against the relevant AQS and Environmental Assessment Level (EAL) limit values to assess the impact of atmospheric emissions from the facility on ambient air quality and human health and the environment.

The purpose of the modelling was to ensure that atmospheric emissions from the proposed facility do not exceed the applicable European and Irish AQSs.

A full assessment against relevant Best Available Techniques (BAT) will be carried out as part of the Industrial Emissions (IE) Licence application which will be submitted for the proposed development to the EPA. This will include an assessment against the requirements of the *Commission Implementing Decision (EU) 2021/2326 For Large Combustion Plants*[1] which sets out BAT-associated emission levels (BAT-AELs) that will be used as a reference to determine the appropriate licence emission limit values (ELVs) for emission parameters.

[1] Commission Implementing Decision (EU) 2021/2326 of 30 November 2021 Establishing Best Available Techniques (Bat) Conclusions, Under Directive 2010/75/EU of the European Parliament And Of The Council, For Large Combustion Plants

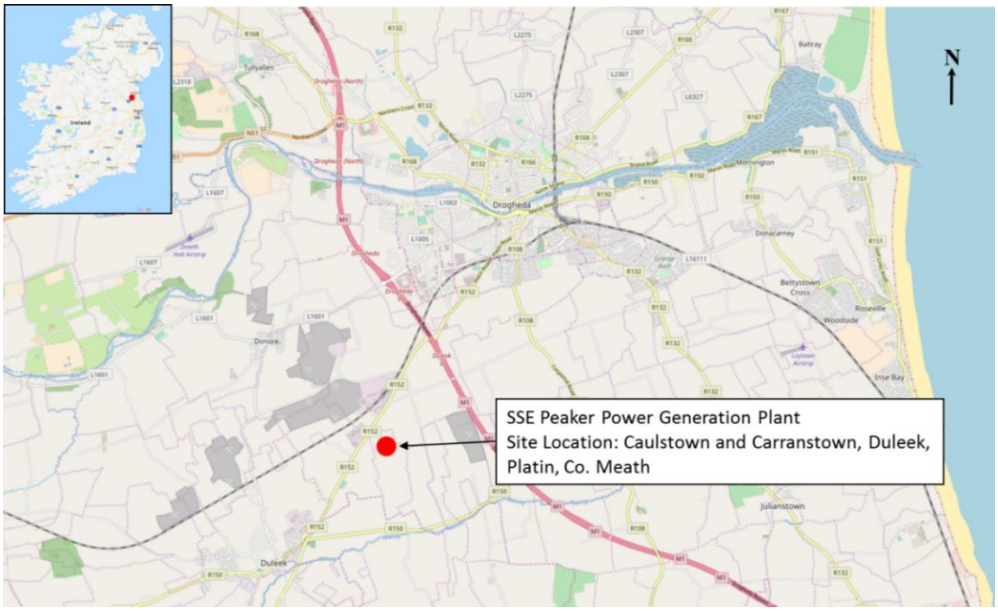

Figure 1-1: **Site Location (Map Source: EPA GIS Map, Basemap: © OpenStreetMap)**

1.2 Proposed Development

The proposed development will comprise a 170MW (electrical output) Open Cycle Gas Turbine (OCGT) Power Plant. The proposed development will comprise an electricity generating plant which will use Hydrotreated Vegetable Oil (HVO) as fuel and will be connected to a previously permitted 110kV substation (ABP-303678-19) and associated site works and improved access from the R152. The development comprises the following elements:

a) Three gas turbine buildings (each 990m^2) each housing 1 no. turbine, 1 no. generator and auxiliary equipment with a total of 269 MWth (thermal output) generating capacity all on concrete plinths.

b) The power plant will have three exhaust stacks (25m in height), one exhaust stack per OCGT. Therefore, each OCGT will comprise a standalone Large Combustion Plant. The power plant may need to utilise, selective catalytic reduction (SCR) (18m high, 4.5 width, 14m length) for nitrogen oxide (NO_x) abatement.

c) Water treatment plant comprising:

- a 275m^2 Deionising Building (6m high x 11m wide x 25m long)
- a raw water treatment tank of 2,262m^3 (12.8m high)
- a deionised water tank (max. volume of 3,925m^3) 15.4m high
- a processed water tank of 450m^3 (9m high)
- 1 no. 20m^2 firefighting water tank of 45m^3 (2m high)
- 1 no. 25m^2 firewater module (4m high x 5m wide x 5m long)
- 1 no. sanitary foul water cesspool tank of 79m^3 located underground (1.98m high x 2.5m wide x 16m long)
- a bulk chemical storage area (4.75m wide x 7.75m long)

d) 2 no. HVO tanks (max. storage of 2300 m^3 of HVO per tank),13m high with a diameter of 15m and associated fuel pumping and filtering equipment and pipework, within a 43.5m L x 45.5m W x 1.5m Bund capacity is 2970m^3

e) 1 ammonia tank –1.8m high 3.5m length with bund 2.5 m x 5 m with a height of 1.5 m

f) 1 no. fuel polishing system (3m high x 6m wide x 24m long)

g) 2 no. 110kV transformers and equipment kiosks each 160m^2, and each measuring (5m high x 10m wide x 15m long). 3 no. Lightning Masts (18m in height) and cable gantry connection to the adjoining consented 110kV Substation.

h) a 520m^2 services building (6m high x 13m wide x 40m long)

i) a 160m^2 Switchgear (MV) building (5m high x 6.1m wide x 26.3m long)

j) all other miscellaneous and ancillary site works, including: 12 no. Car parking spaces and 1 No. fuel unloading bay, one lowered site platform area, internal circulation road, new internal access roads and hard and soft landscaping including a material berms (1.2m to 2m high), a temporary construction compound, temporary security building, staff welfare facilities, and palisade associated fencing (2.4m high).

k) New road markings, including deceleration lane approaching the site, on the R152

2 Receiving Environment and Sensitive Receptors

The proposed development is located in a rural setting approximately 4.5 km south-west of the Drogheda town centre. There are two Industrial Emission (IE) licenced facilities within close proximity (Figure 2-1). The boundary of Indaver Ireland Ltd. (IE Licence No. W0167-03) is located approximately 50m north-west of the site and the boundary for Irish Cement Ltd. (IE Licence No. P0030-06) is located approximately 200m north.

The nearest sensitive receptors regarding air emission from the site are illustrated in Figure 2-1.

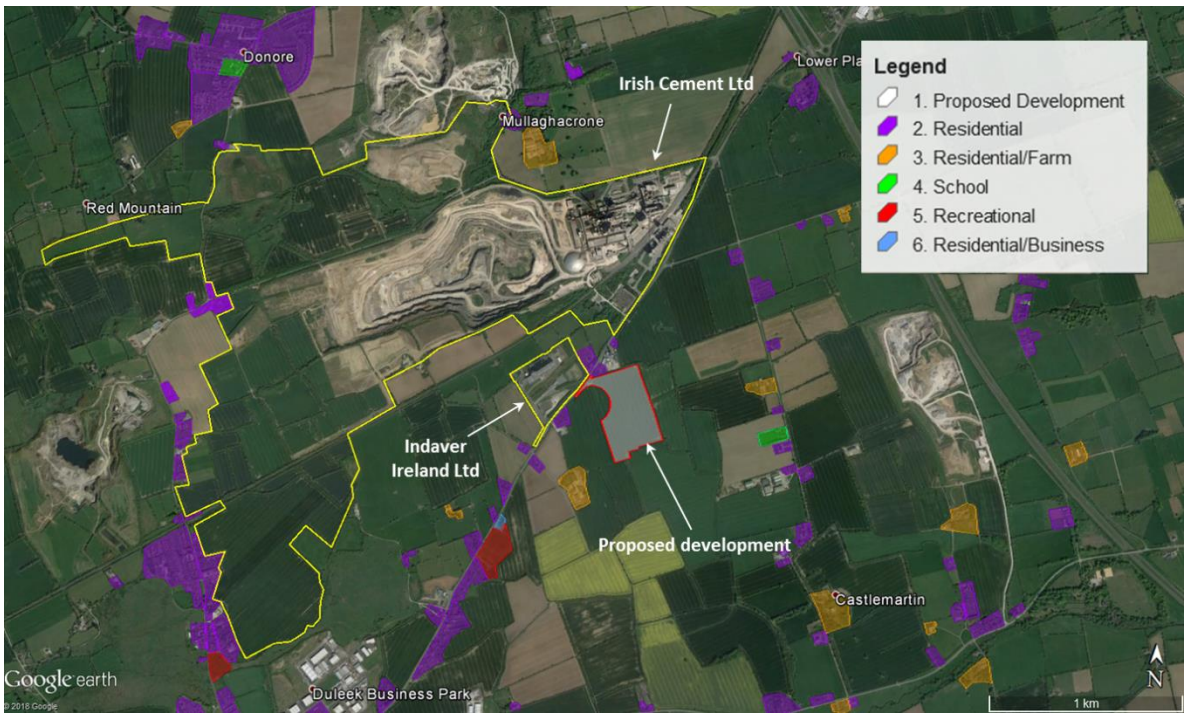

Figure 2-1: Sensitive receptors surrounding proposed development (Basemap: Google Earth, ownership boundary is outlined in red)

Special areas of conservation (SAC), special protection areas (SPA) and proposed natural heritage areas (pNHA) within a 15km radius of the proposed development are listed overleaf in Table 2-1. The SACs and SPAs are shown in Figure 2-2.

Table 2-1: SACs and SPAs within 15km and nearest pNHAs surrounding the site

Site	Site Code	Nearest Distance from site boundary	Nearest Co-ordinate point to site boundary (Irish National Grid)
Special Areas of Conservation (SAC) (within 15km)			
River Boyne and River BlackWater SAC	002299	3.5 km NW	(304113.99E, 273411.83N)
Boyne Coast and Estuary SAC	001957	7 km NE	(310425.15E, 275506.42N)
Special Protection Area (SPA) (within 15km)			
River Boyne and River BlackWater SPA	004232	3.7 km NW	(303708.62E, 273358.42N)
Boyne Estuary SPA	004080	6 km NE	(310753.40E, 275381.84N)
River Nanny and Shore SPA	004158	7.7 km E	(314637.14E, 270752.67N)
Proposed Natural Heritage Area (pNHA) (nearest surrounding site)			
Duleek Commons	001578	2.3 km WSW	(304590.18E, 269599.07N)
Rossnaree Riverbank	001589	6.6 km NW	(300054.41E, 271789.47N)
Dowth Wetland	001861	4 km NNW	(303830.16E, 273805.3N)
Boyne River Islands	001862	4.5 km N	(305872.6E, 275444.81N)
Boyne Coast and Estuary	001957	7km NE	(311908.74E, 275735.3N)
Laytown Dunes/Nanny Estuary	000554	6.6km E	(313491.93E, 270522.42N)
Cromwell's Bush Fen	001576	6.4 km SSE	(309932.09E, 264999.42N)

Figure 2-2: SACs and SPAs within 15km of the proposed development (Map Source: EPA GIS Map)

2.1 Ambient Air Quality Standards

Air Quality Standards (AQSs) 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. AQSs set limit values for Ground Level Concentrations (GLCs) of certain pollutants for both the short term (hourly, daily) and long term (annual averages). Limit values are often expressed as percentiles e.g. 98 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. 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. 739/2022) replaces S.I. No. 180/2011 which implemented EU Directive 2008/50/EC on ambient air quality and cleaner air for Europe. This Directive merges most of the existing directives (Directives 96/62/EC, 1999/30/EC, 2000/69/EC and 2002/3/EC) into a single directive. The regulations set ambient air quality limit values for sulphur dioxide (SO_2), nitrogen dioxide (NO_2) and oxides of nitrogen (NO_x), benzene, lead and particulate matter (PM_{10}/ $PM_{2.5}$). S.I. No. 739/2022 sets the limit values and alert thresholds for air pollution for particular pollutants and also specifics the requirements for monitoring and reporting air quality data.

Emissions to the atmosphere from the proposed development include some of the pollutants addressed in the above air quality legislation. Therefore, the relevant air quality standards for this air quality assessment are detailed in Table 2-2 overleaf.

Table 2-2: **Relevant Air Quality Standard (AQS) Limit Values**

Pollutant	AQS ($\mu g/m^3$)	Source of AQS Value
Oxides of Nitrogen (NO_2 / NO_x)		
NO_2 99.8 Percentile Hourly	200	EU Directive 2008/50/EC / S.I. 739 of 2022
NO_2 Annual	40	EU Directive 2008/50/EC / S.I. 739 of 2022
NO_x + NO_2 Annual (Protection of Vegetation)	30	EU Directive 2008/50/EC / S.I. 739 of 2022
Sulphur Dioxide (SO_2)		
SO_2 99.7 Percentile Hourly	350	EU Directive 2008/50/EC / S.I. 739 of 2022
SO_2 99.2 Percentile Daily	125	EU Directive 2008/50/EC / S.I. 739 of 2022
SO_2 Annual & Winter (1st October – 31st Mar) (Protection of Vegetation)	20	EU Directive 2008/50/EC / S.I. 739 of 2022
Carbon Monoxide (CO)		
CO 8-hour	10,000	EU Directive 2008/50/EC / S.I. 739 of 2022
Particulate Matter less than 10 µm (PM_{10})		
PM_{10} 90.4 Percentile Daily	50	EU Directive 2008/50/EC / S.I. 739 of 2022
PM_{10} Annual	40	EU Directive 2008/50/EC / S.I. 739 of 2022
Particulate Matter less than 2.5 µm ($PM_{2.5}$)		
$PM_{2.5}$ Annual (up to end of 2019)	25	EU Directive 2008/50/EC / S.I. 739 of 2022
$PM_{2.5}$ Annual (from Jan 2020 onwards)	20	EU Directive 2008/50/EC / S.I. 739 of 2022
Ammonia (NH_3)		
NH_3 hourly	2,500	U.K. Department for Environment, Food & Rural Affairs (DEFRA) Environmental Assessment Level (EAL)
NH_3 Annual	180	U.K. Department for Environment, Food & Rural Affairs (DEFRA) Environmental Assessment Level (EAL)

3 Air Dispersion Modelling

3.1 Dispersion Model

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 all emission points on site. Using this input data, 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.

Emissions from the proposed development have been modelled using AERMOD software (Version 19191), which has been developed by the U.S. Environmental Protection Agency (US EPA). The model is a steady-state Gaussian plume model used to assess pollutant concentrations associated with industrial sources. The model has been designated the regulatory model by the US EPA for modelling emissions from industrial sources in both flat and complex terrain. The modelling and reporting methodology was carried out based on the Irish Environmental Protection Agency (EPA) document *'Air Dispersion Modelling from Industrial Installations Guidance Note (AG4) (2020)'*.

3.2 Meteorological Data

The meteorological data required by the dispersion model is 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.

The model has been run for each pollutant using five years of meteorological data (2017-2021) from Dublin Airport Meteorological Station. This is considered representative and appropriate data for use in the model and also satisfies the requirement of the Irish EPA AG4 Guidance Note. The meteorological windrose for the years 2017 to 2021 is presented in Figure 3-1.

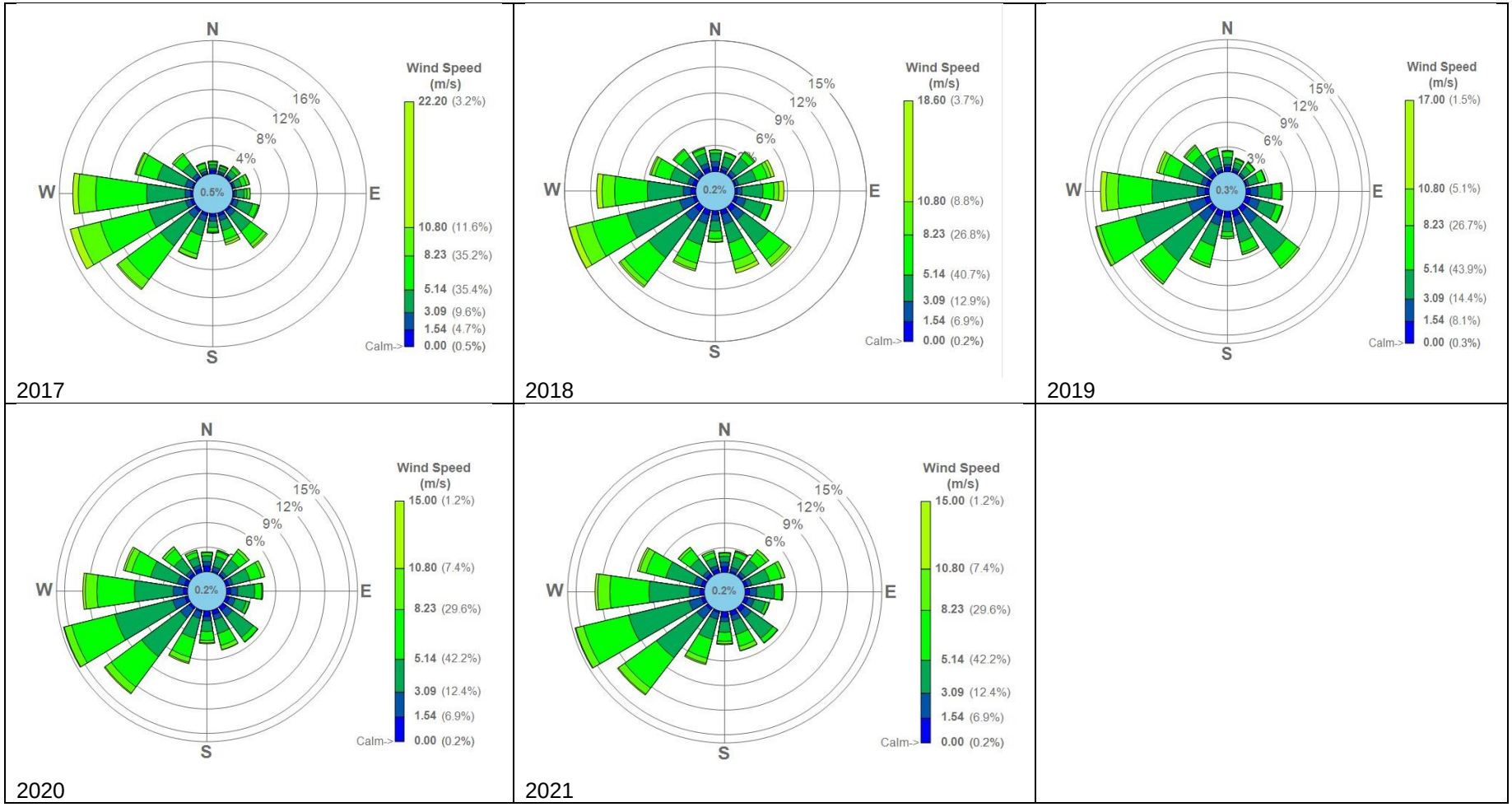

Figure 3-1: Meteorological Windrose for Dublin Airport Station 2017 to 2021

3.3 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 stacks modelled are 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). The dimensions of the buildings and tanks included in the modelling analysis are outlined in Table 3-1.

Table 3-1: Buildings and tanks included in the model to account for Building Downwash

Structure Description	Structure Height (m)	Elevation (m)
Switchgear building	5	34.5
GT3 Lube Oil Cooler 1	3.719	34.5
GT3 Lube Oil Cooler 2	3.719	34.5
GT2 Lube Oil Cooler 1	3.719	34.5
GT2 Lube Oil Cooler 2	3.719	34.5
GT1 Lube Oil Cooler 1	3.719	34.5
GT1 Lube Oil Cooler 2	3.719	34.5
GT1 Exhaust and Scrubber	18	34.5
GT2 Exhaust and Scrubber	18	34.5
GT3 Exhaust and Scrubber	18	34.5
Services Building	5	34.5
Denionising Building	6	34.5
Fire Fighting Water tank	2	34.5
Sodium HydroxideTank	2.8	34.5
Water Treatment Chemicals tank	2.8	34.5
Denionised water tank	15.4	34.5
Raw water tank	12.8	34.5
Processed water tank	9	34.5
HVO tank	13	34.5
HVO tank	13	34.5
Ammonia Tank	1.8	34.5
OCGT Enclosure 1	16.9	34.5
OCGT Enclosure 2	16.9	34.5
OCGT Enclosure 3	16.9	34.5
Fuel Polishing System	3	34.5
Firewater Module	4	34.5

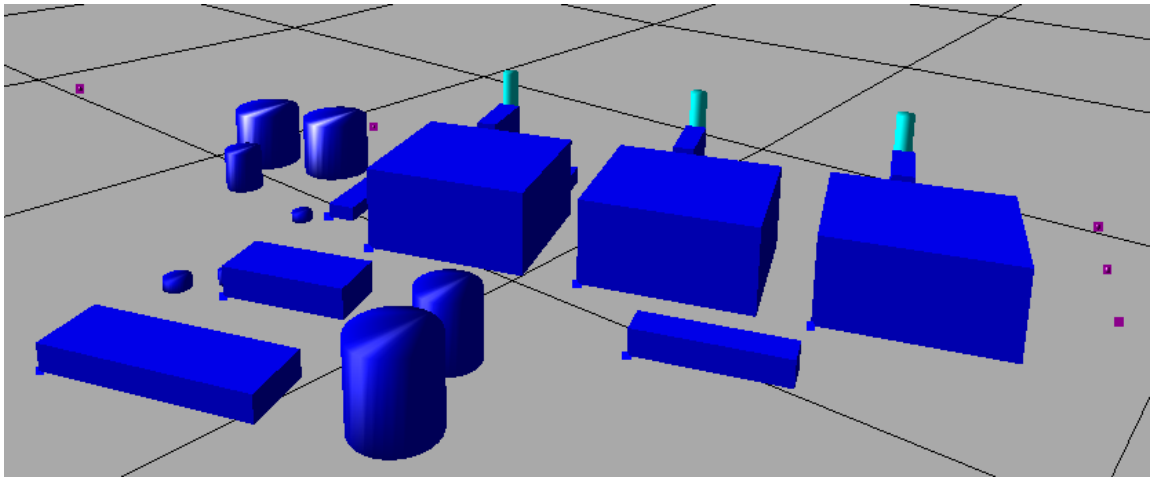

Figure 3-2: Image showing buildings and tanks included in the air dispersion model (also shown in turquoise are the emission stacks)

3.4 Model Receptor Points

The model was set up to examine the impact of emissions on the area surrounding the proposed development using a series of receptors. A receptor is a location at which the model will calculate maximum process contributions (PCs). A Cartesian co-ordinate receptor grid system was established centred on the area of the emission stacks. Grid convergence was performed to determine the optimum configuration, which was a nested grid consisting of:

- **Coarse grid**: Area of 20 km by 20 km with 500 m grid spacing
- **Fine grid**: Area of 4 km by 4 km with 100 m grid spacing

Receptors points were also established around the site boundary (spaced every 100m) and at the sensitive receptors, discussed in Section 2 of this report (NOTE: The ownership boundary was used in the model as opposed to the planning application boundary). Figure 3-3 shows a screenshot of the build model and receptor grids.

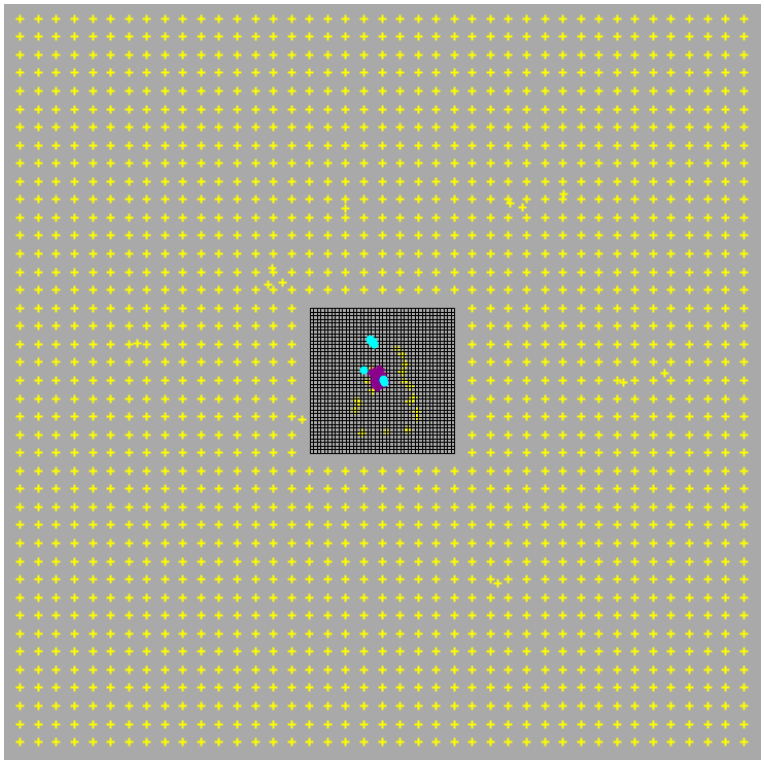

Figure 3-3: **Built Model including Receptor Grids**

3.5 Terrain Data

A terrain height for each of the receptors on the grid was input to the model in order to accurately represent the changing elevations of the surrounding landscape. Digitised terrain data was incorporated into the model using a Digital Elevation Model (DEM) file and the AERMAP function of the AERMOD software. It is noted that the facility objects, i.e. the buildings and the stacks were set at the floor levels indicated on the planning drawings, i.e. the DEM file was only used to give the elevations of the off-site receptors.

3.6 Stack Discharge Parameters and Emissions Data

The characteristics and emissions data are outlined in Table 3-2 for the proposed development. Figure 3-4 show the locations of the stacks within the model.

The plant design will allow for flexible operation so the plant can cater for high demand and respond quickly to fluctuations on the electricity grid. Operation over extended periods is not foreseen. The running regime, in terms of load and runtime, will depend on the size of the peak load experienced. It is anticipated that the plant will operate a maximum of 1,800 hours per year with the highest expected demand during winter months. The air dispersion modelling has conservatively considered the proposed development to be operational 24 hours a day, 7 days a week.

Table 3-2: Turbine Stacks Discharge Parameters and Emissions Data

Item	Value
Stack height	25 m
Stack internal diameter	3.541 m
Exit gas temperature @ 100% load	454 °C
Discharge volumetric flowrate @ 100% full load	459,549 Nm^3/hr
Exit gas velocity @ 100% load	34.52 m/s
Nitrogen oxides (NO_x) max. emission concentration	50 mg/Nm^3
NO_x max. emission rate	6.38 g/s
Sulphur dioxide (SO_2) max. emission concentration	5 mg/Nm^3
SO_2 max. emission rate	0.64 g/s
Carbon monoxide (CO) max. emission concentration	100 mg/Nm^3
CO max. emission rate	12.77 g/s
Particulates max. emission concentration	5 mg/Nm^3
Particulates max. emission rate	0.64 g/s
Ammonia max. emission concentration	10 mg/Nm^3
Ammonia max. emission rate	1.28 g/s

NO_x/NO_2 Chemistry

During combustion a mixture of both nitric oxide (NO) and nitrogen dioxide (NO_2) is released. Once released, a series of complex chemical reactions take place during which a portion of the NO is converted into NO_2.

In accordance with the EPA's AG4 Guidance, the following default factors were used to covert the NO_x modelled to NO_2 for comparison with the relevant Air Quality Standard Limits:

- Annual NO_2/NO_x ratio of 1.00;
- 1-hour NO_2/NO_x ratio of 0.50.

3.6.1 Best Available Techniques-Associated Emission Levels (BAT-AELs)

The proposed development will be designed to the highest specification in line with Best Available Technologies (BAT) thus ensuring that atmospheric emissions from the facility will not result in an impact to human health or the environment. The proposed OCGT units have been specified so that the pollutant maximum emissions levels as set out in Table 3-2 will not be exceeded.

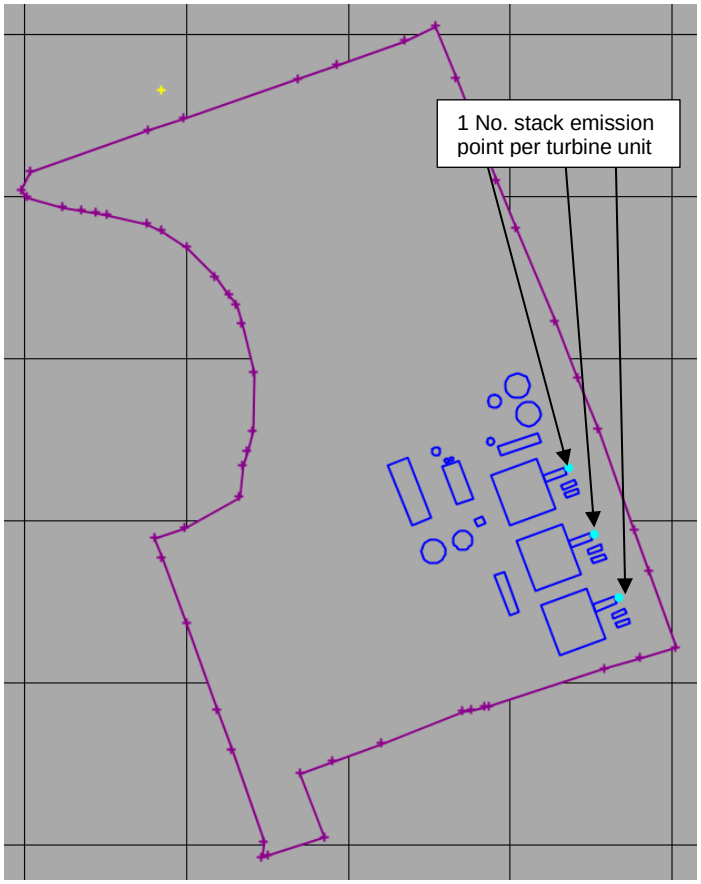

Figure 3-4 Stack Locations (turquoise dots represent each emission point) (NOTE: The ownership boundary was used in the model as opposed to the planning application boundary)

3.7 Cumulative Assessment and Off-site Stack Emissions Data

As discussed in Section 2 of this report, there are two IE Licenced sites, namely Irish Cement Ltd. and Indaver Ireland Ltd., near the proposed development. Both of these sites have the potential to emit more than 100 tonnes per annum of some (in the case of Indaver) or all (in the case of Irish Cement) of the pollutants being assessed as part of this air dispersion model. Hence the relevant stack emissions for both these sites were included as part of the air dispersion model. The stack discharge parameters and emissions data used are outlined in **Appendix C**.

3.8 Sensitivity Analysis and Modelling Scenarios

To determine the worst case modelling scenarios for the air dispersion modelling, sensitivity analysis was performed on the operational load and associated varying discharge parameters.

The emission flowrate, temperature and velocity vary depending upon the load. Table 3-3 details the varying emission discharge parameters with operational load.

Table 3-3: Discharge parameters for varying operational load

Item	100% Load	70% Load	35% Load
Exit Gas Temperature (°C)	454	454	454
Volumetric Flow rate Nm^3/hr	459,549	384,950	297,573
NO_x conc. (mg/Nm^3)	50	50	50
SO_x conc. (mg/Nm^3)	5	5	5
CO conc. (mg/Nm^3)	100	100	100
Dust conc. (mg/Nm^3)	5	5	10
Ammonia conc. (mg/Nm^3)	10	10	10
NO_x emission rate (g/s)	6.38	5.35	4.13
SO_x emission rate (g/s)	0.64	0.53	0.41
CO emission rate (g/s)	12.77	10.69	8.27
Dust emission rate g/s	0.64	0.53	0.83
Ammonia emission rate g/s	1.28	1.07	0.83
Exit Gas Velocity m/s	34.52	28.92	22.35

4 Modelling Results

Tables 4-3 and 4-4 outline the results of the modelling exercise. The predicted maximum process contributions (PCs) outlined in Tables 4-3 to 4-4 are the cumulative effect of the proposed development and nearby facilities (Irish Cement Ltd. and Indaver Ireland Ltd.). Reported are the annual values and the relevant percentiles of hourly or daily values. Contour plots have also been produced for each scenario using the BREEZE 3D Analyst software tool and Google Earth Pro and are included in **Appendix A**.

4.1 Predicted Environmental Concentrations

Predicted Environmental Concentrations (PECs) (i.e. background concentrations plus modelled process contributions) were also calculated for each parameter and averaging time, for comparison to AQS limit values. This assessment ensures that both the modelled emission and the existing background concentrations are taken into account when determining the possible overall ambient air quality once the proposed facility is operational.

The site is located within Air Quality Zone D: Rural Ireland, however it is very close to Air Quality Zone C: Other Cities and Large Towns (Figure 4-1). Adopting a conservative approach, the monitoring results for Zone C will be used as they will give a higher background concentration than those for Zone D monitoring stations.

Figure 4-1: Air Quality Zones around the Proposed Development Site (Map Source: EPA GIS Map

The EPA produces an annual report on air quality[2], which details the results from monitoring stations throughout the various Air Quality Zones within Ireland. Outlined in **Appendix B** is the Zone C monitoring stations results for the relevant study pollutants covering the five year period 2017-2021.

Table 4-1 summarises the background concentrations for these Zone C stations selected.

The background concentrations for Ammonia were gathered from the EPA[3] which collected data from various monitoring stations located around the island of Ireland in the years 2013 and 2014. This is the most recent data available for ambient ammonia in the study area.

[2] The latest issued EPA report is *Air Quality in Ireland 2021 Key Indicators of Ambient Air Quality (2022)*

[3] EPA Research report *Ambient Atmospheric Ammonia in Ireland 2013-2014* (2017)

Table 4-2 summarises the background concentrations for ammonia for the area surrounding the proposed development.

Table 4-1: **EPA Quality Zone C Monitoring Stations: Background Pollutant concentrations (µg/m^3) for period 2017 to 2021**

Pollutant Parameter	Resultant Estimated Background Concentration
Nitrogen Dioxide (NO_2) Hourly - Annual Mean	**12.05 µg/m^3**
Nitrogen Dioxide (NO_2) Hourly - 99.8th Percentile	**24.10 µg/m^3**
Sulphur Dioxide (SO_2) Hourly – Annual Mean	**2.85 µg/m^3**
Sulphur Dioxide (SO_2) Hourly – 99.7th Percentile	**5.7 µg/m^3**
Sulphur Dioxide (SO_2) Daily – 99.2th Percentile	**5.7 µg/m^3**
Carbon Monoxide (CO) 8-Hour – Annual Mean	**0.22 mg/m^3**
Particulate Matter (PM_{10}) Daily – Annual Mean	**13.8 µg/m^3**
Particulate Matter ($PM_{2.5}$) Daily – Annual Mean	**8.4 µg/m^3**

Table 4-2: **Background Ammonia (NH_3) concentrations (µg/m^3) for period 2013 to 2014**

Pollutant Parameter	Resultant Estimated Background Concentration
Ammonia (NH_3) Hourly mean	**3.2 µg/m^3**
Ammonia (NH_3) Hourly – Annual mean	**1.6 µg/m^3**

In relation to annual mean values the background concentrations were added directly to the maximum annual predicted concentrations for human health. This is also the case for the daily PM_{10} values and the 8 hour CO. In relation to combining the short term (relevant to hourly NO_2, SO_2 and daily SO_2) peak contributions with background concentrations, guidance from the Appendix E of the 'EPA AG4 Guidance Note' advises that the background concentration should be twice the annual mean value added to the short term process contribution.

These background concentrations have been combined with the predicted ground level concentrations (GLCs) in order to determine the PECs, as summarised in the dispersion modelling results tables (Tables 4-3 and 4-4).

Table 4-3: **Air Dispersion Modelling Results**

Pollutant	Averaging Period	Predicted Max. Process Contribution (PC) (µg/m^3)	Predicted Max Occurred at Location (UTM Coords.)	Predicted Max Occurred in Year	Background Conc.[1] (µg/m^3)	PEC: Background + Process Contribution (µg/m^3)	Air Quality Standards/ Limit Value (µg/m^3)	Predicted PC as Percentage of Limit	PEC as Percentage of Limit
Nitrogen Dioxide (NO_2)	99.8th Percentile of 1 hr means	42.93	671863, 5951938	2021	24.1	67.03	200	21.47%	33.52%
	Annual Mean (Human Health Protection)	4.03	673663, 5952337	2017	12.05	16.1	40	10.07%	40.20%
	Annual Mean (Protection of Vegetation)						30	13.43%	53.59%
Sulphur Dioxide (SO_2)	99.7th Percentile of 1 hr means	22.60	669763, 5951538	2021	5.69	28.30	350	6.46%	8.08%
	99.2th Percentile of Daily Means	7.04	672263, 5951938	2021	5.69	12.74	125	5.63%	10.19%
	Annual Mean (Protection of Vegetation)	0.998	673163, 5952037	2017	2.85	3.84	20	4.99%	19.22%
Carbon Monoxide (CO)	8 hr Mean	234.91	671863,5952337	2018	220	454.9	10,000	0.563%	4.55%

Pollutant	Averaging Period	Predicted Max. Process Contribution (PC) (µg/m^3)	Predicted Max Occurred at Location (UTM Coords.)	Predicted Max Occurred in Year	Background Conc.[1] (µg/m^3)	PEC: Background + Process Contribution (µg/m^3)	Air Quality Standards/ Limit Value (µg/m^3)	Predicted PC as Percentage of Limit	PEC as Percentage of Limit
Particulate Matter less than 10 µm (PM_{10})	90.4th Percentile of Daily Means	0.63	671763, 5952238	2019	13.8	14.4	50	1.26%	28.86%
	Annual Mean	0.196	673263, 5950837	2017	13.8	14.0	40	0.49%	34.99%
Particulate Matter less than 2.5 µm ($PM_{2.5}$)	Annual Mean	0.196	673263,5950837	2017	8.4	8.6	20	0.98%	42.98%
Ammonia (NH_3)	Hourly mean	13.63	672763,5950337	2019	3.2	16.8	2,500	0.55%	0.67%
	Annual Mean	0.28	673663,5952437	2017	1.6	1.9	180	0.16%	1.04%

NOTES

1. From EPA Guidance document AG4:
   - the 99.8th percentile NO_2 PEC is equal to 99.8th percentile concentration plus twice the annual mean background NO_2;
   - the 99.7th percentile of 1-hr SO_2 PEC is equal to 99.7th percentile concentration plus twice the annual mean background SO_2;
   - the 99.2th percentile of daily SO_2 PEC is equal to 99.2th percentile concentration plus twice the annual mean background SO_2;
   - the 90.4th percentile PM_{10} daily PEC is equal to 90.4th percentile concentration plus the annual mean background PM_{10}

Table 4-4 Air Dispersion Modelling Results – Maximum Annual NO_2 concentration for nearest SACs

Sensitive Receptor		UTM Coordinates (Zone 29N)		Year of Max Predicted Results	Max Annual NO_2 Process Contributions (PC) conc. (µg/m^3)	Background Concentration (µg/m3)	Max Annual NO_2 PEC conc. (µg/m^3)	Air Quality Standards/ Limit Value (µg/m^3)	Predicted Result as Percentage of Limit
No	Description	Easting	Northing						
21	River Boyne and River Blackwater SAC	670026	5953246	2019	1.63	12.05	13.68	30	45.6%
22	Boyne Coast and Estuary SAC	676306	5955429	2017	1.28		13.33		44.4%
23	River Boyne and River BlackWater SPA	669622	5953187	2019	1.28		13.33		44.4%
24	Boyne Estuary SPA	676636	5955309	2017	1.35		13.40		44.7%
25	River Nanny and Shore SPA	680583	5950736	2017	0.90		12.95		43.2%

The results in Table 4-3 are those for the worst case modelling scenarios, as determined from the sensitivity assessment, the results of which are outlined in **Appendix D**.

The process contributions for each pollutant parameter indicated in Table 4-3 are the sum of contributions from both the proposed development and offsite emission stacks. The breakdown of these process contributions between on-site and off-site emissions is shown in Tables 4-5.

Table 4-5: Breakdown of Total Process Contribution between Proposed Development and Off-Site Emissions

Pollutant	Averaging Period	Predicted Max. Process Contribution (PC) ($\mu g/m^3$)	Proposed Development PC as % of Total PC	Off-Site PC as % of Total PC
Nitrogen Dioxide (NO_2)	99.8th Percentile of 1 hr means	42.93	25%	75%
	Annual Mean (Human Health Protection)	4.03	15%	85%
	Annual Mean (Protection of Vegetation)			
Sulphur Dioxide (SO_2)	99.7th Percentile of 1 hr means	22.60	6.3%	93.7%
	99.2th Percentile of Daily Means	7.04	5.9%	94.1%
	Annual Mean (Protection of Vegetation)	0.998	6%	94%
Carbon Monoxide (CO)	8 hr Mean	234.91	24.0%	76.0%
Particulate Matter less than 10 µm (PM_{10})	90.4th Percentile of Daily Means	0.63	51%	49%
	Annual Mean	0.196	67%	33%
Particulate Matter less than 2.5 µm ($PM_{2.5}$)	Annual Mean	0.196	67%	33%
Ammonia (NH_3)	Hourly Mean	13.63	99.97%	0.03%
	Annual Mean	0.28	44%	56%

4.2 Environmental Loading at Ecological Sites

4.2.1 Critical Level NO_2

Sensitive receptors surrounding the site were discussed in Section 2 of this report. As mentioned, the nearest SAC to the site is the River Boyne and River Blackwater SAC (site code 002299), at approximately 3.5 km northwest from the boundary of the site. A critical level for ambient annual NO_2 concentration is specified in the Air Quality Standards Regulations 2011 (S.I. No. 739 of 2022) as 30 µg/m^3. The intent of this critical level for vegetation was to assess the impact at distances greater than 20 km from the source of NO_2 emissions. It is also appropriate to use this limit value in assessing any impacts on local rivers and small sites of ecological importance.

The predicted PC NO_2 value generated by the proposed development and neighboring facilities is at the nearest point of the River Boyne and River Blackwater SAC is 1.63 µg/m^3. Using a background NO_2 concentration of 12.05 µg/m^3 (refer to Section 4.1 of this report) the maximum annual average PEC at the River Boyne and River Blackwater SAC is equivalent to 45.6% of the AQS.

5 Discussion and Conclusions

As can been seen from Table 4-3, the cumulative maximum predicted ground level concentrations (GLCs) of NO_2, SO_2, CO, $PM_{10/2.5}$ and NH_3 arising from the operation of the proposed development and neighbouring facilities are well below the relevant Air Quality Standards (AQSs) and Environmental Assessment Levels (EALs). Furthermore, the PECs are also below the relevant AQSs and EALs.

It is noted that the air dispersion modelling has conservatively considered the proposed development to be operational 24 hours a day, 7 days a week. As stated in this report, it is intended that the plant will operate for no more than 1,800 hours annually, therefore the air emissions generated by the operation of the facility will be less than stated in Table 4-3.

It is therefore concluded that atmospheric emissions from the proposed development will not have a significant impact on ambient air quality.

Appendix A
Dispersion Modelling Contour

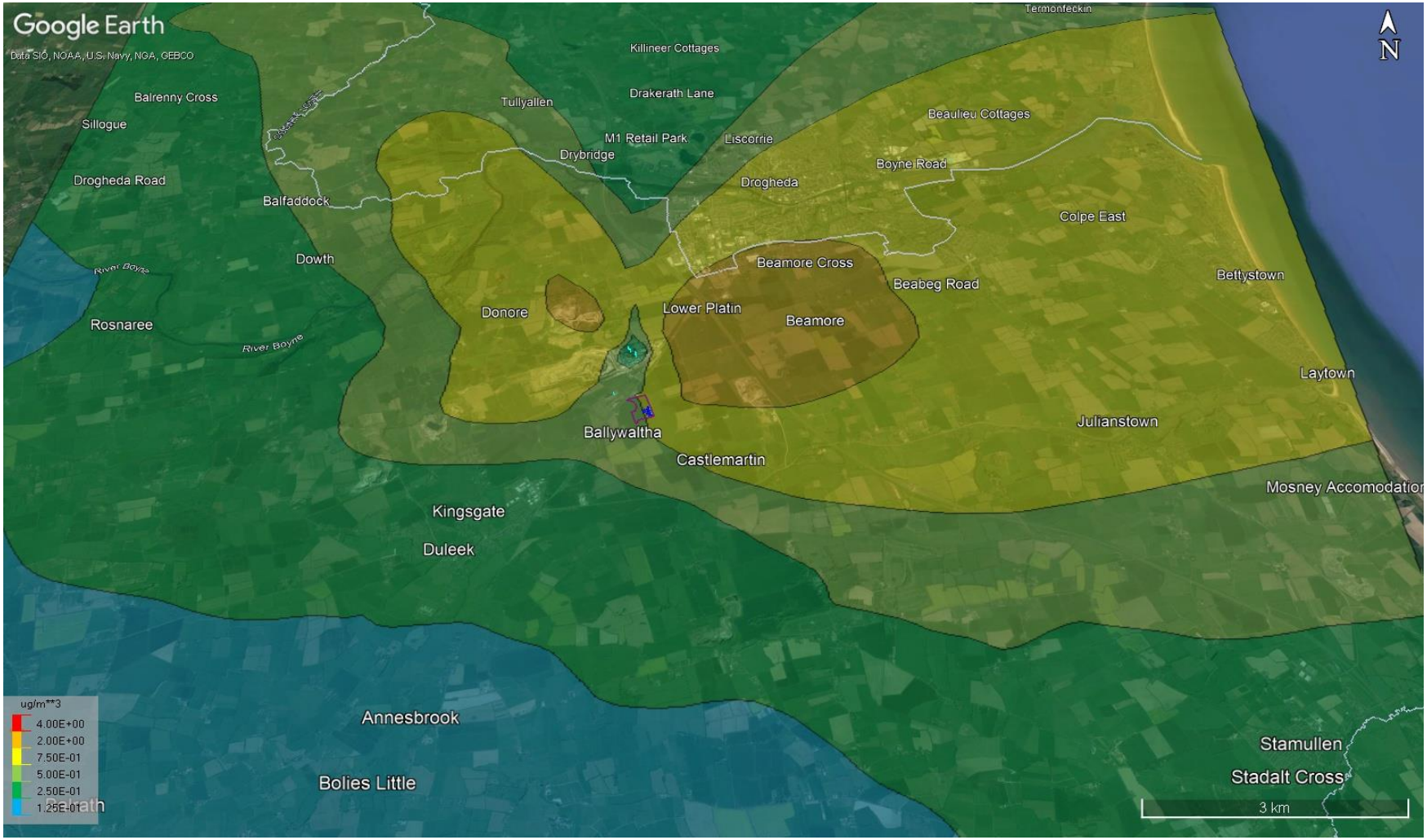

Figure 1: 99.8%ile of Hourly Mean Ground Level Concentrations for NO_2 at 100% Load (2021 Met Year) (Base Image from Google Earth)

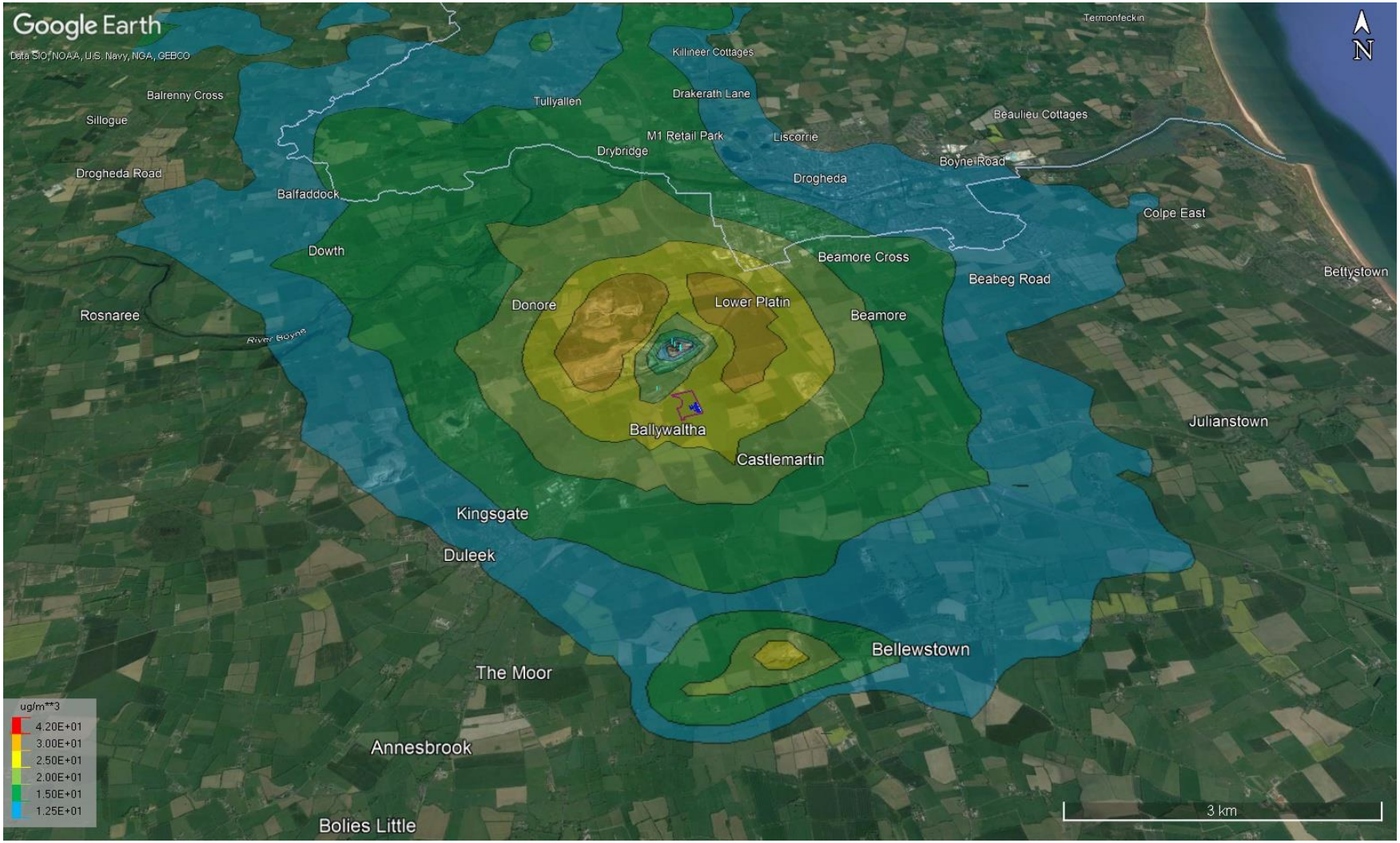

Figure 2: Annual Mean Ground Level Concentrations for NO_2 at 100% Load (2017 Met Year) (Base Image from Google Earth)

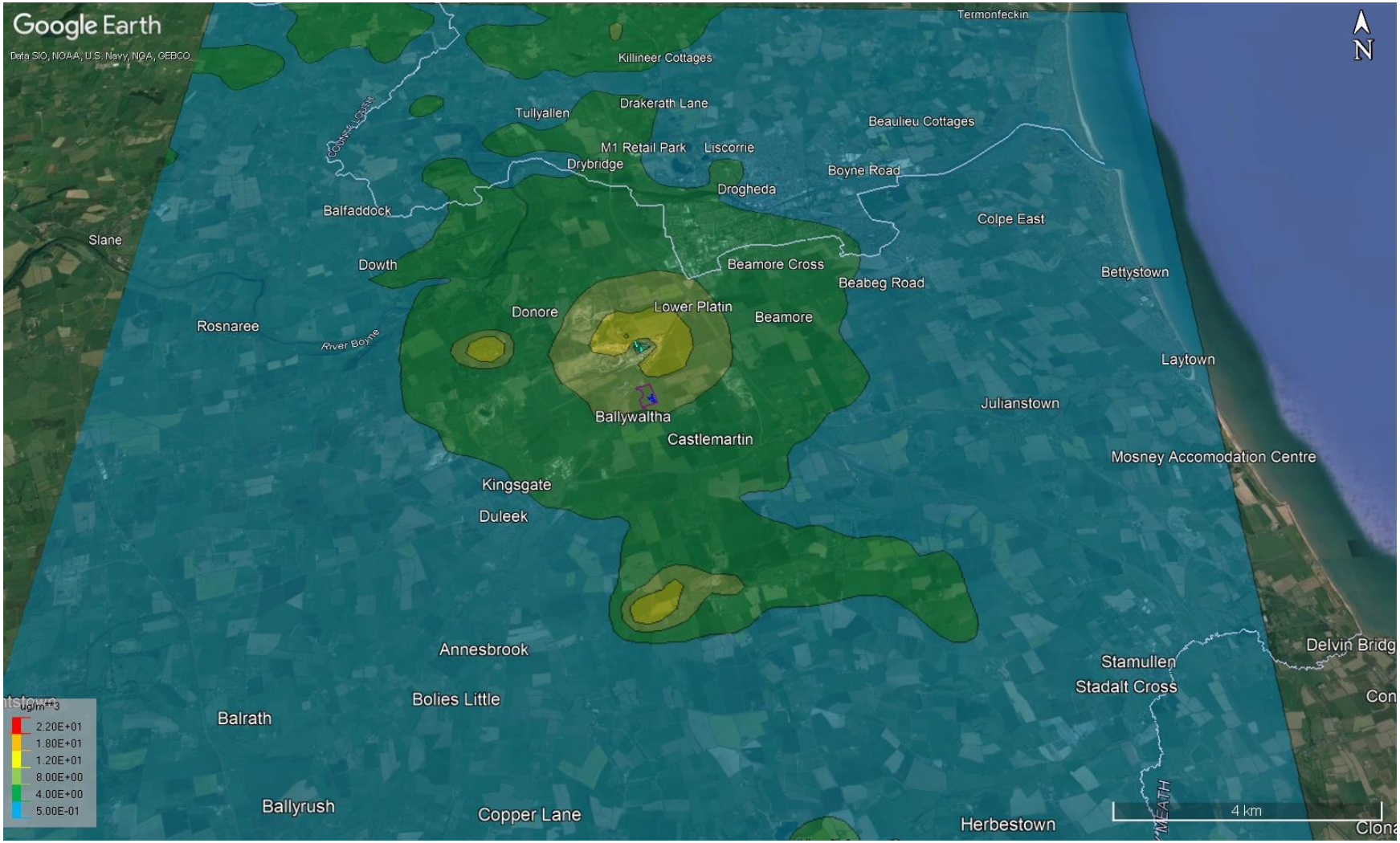

Figure 3: 99.7%ile of Hourly Mean Ground Level Concentrations for SO_2 at 35% Load (2021 Met Year) (Base Image from Google Earth)

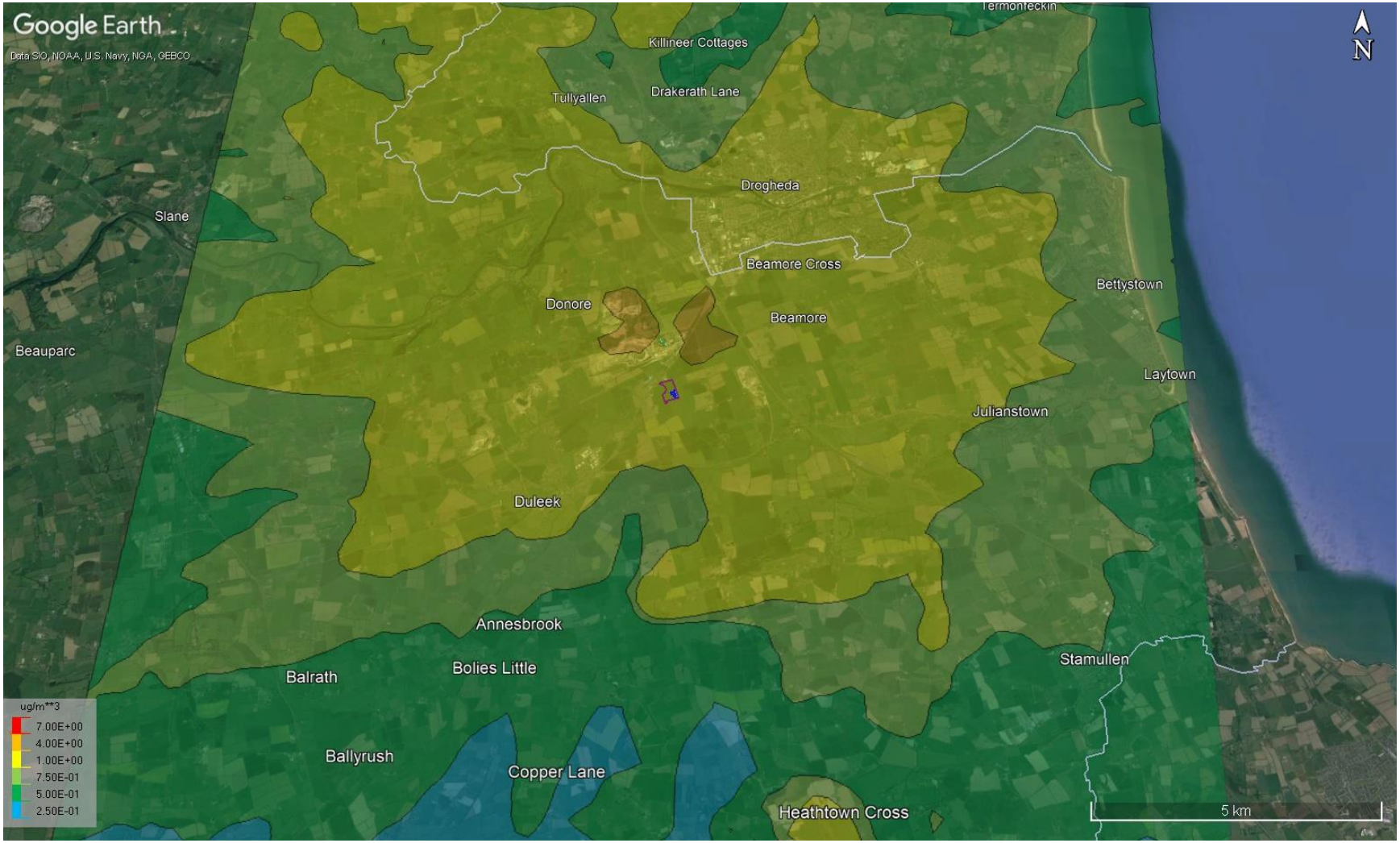

Figure 4: 99.2%ile of Daily Mean Ground Level Concentrations for SO_2 at 100% Load (2021 Met Year) (Base Image from Google Earth)

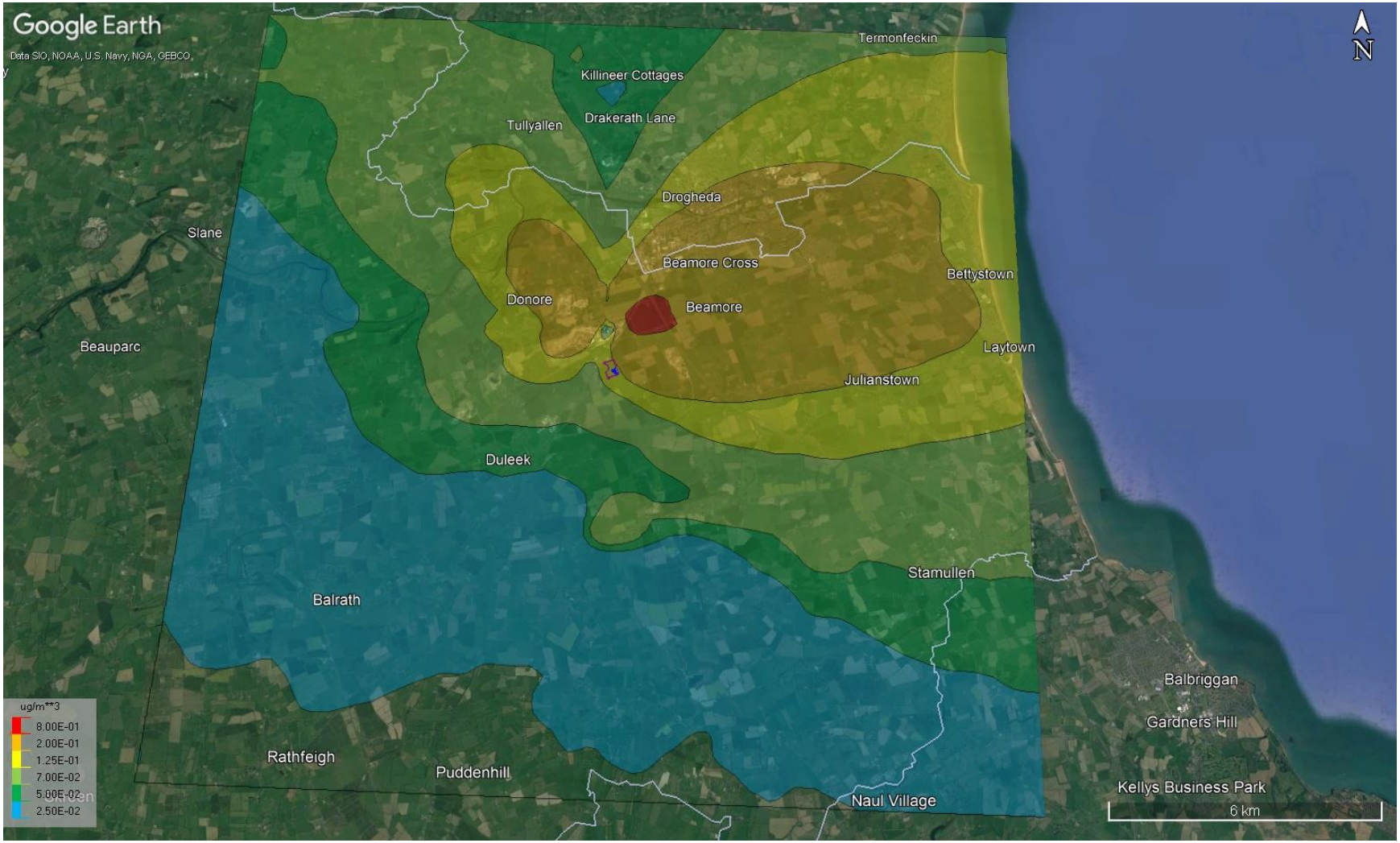

Figure 5: Annual Mean Ground Level Concentrations for SO_2 at 100% Load (2017 Met Year) (Base Image from Google Earth)

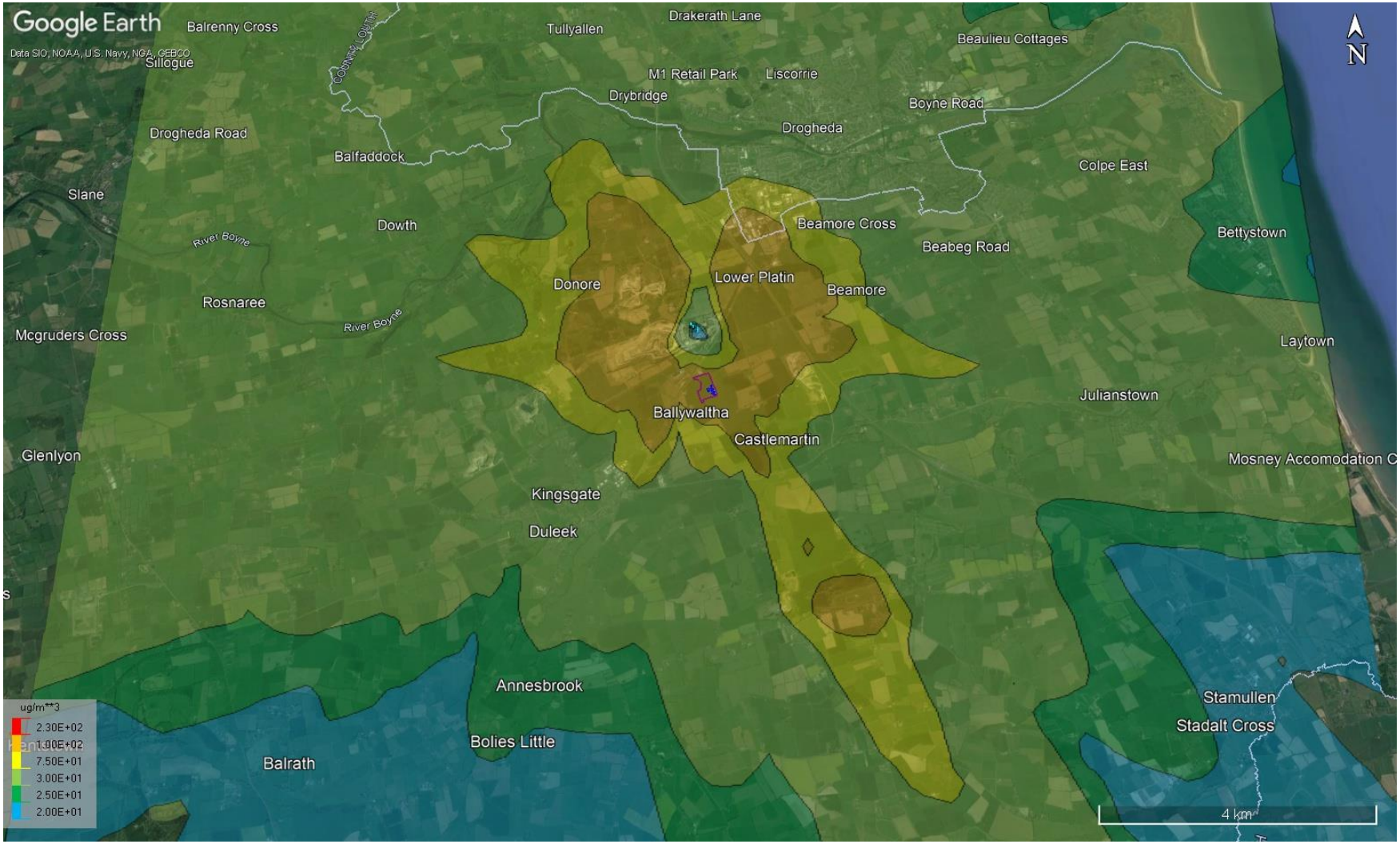

Figure 6: 8 hour Mean Ground Level Concentrations for CO at 100% Load (2018 Met Year) (Base Image from Google Earth)

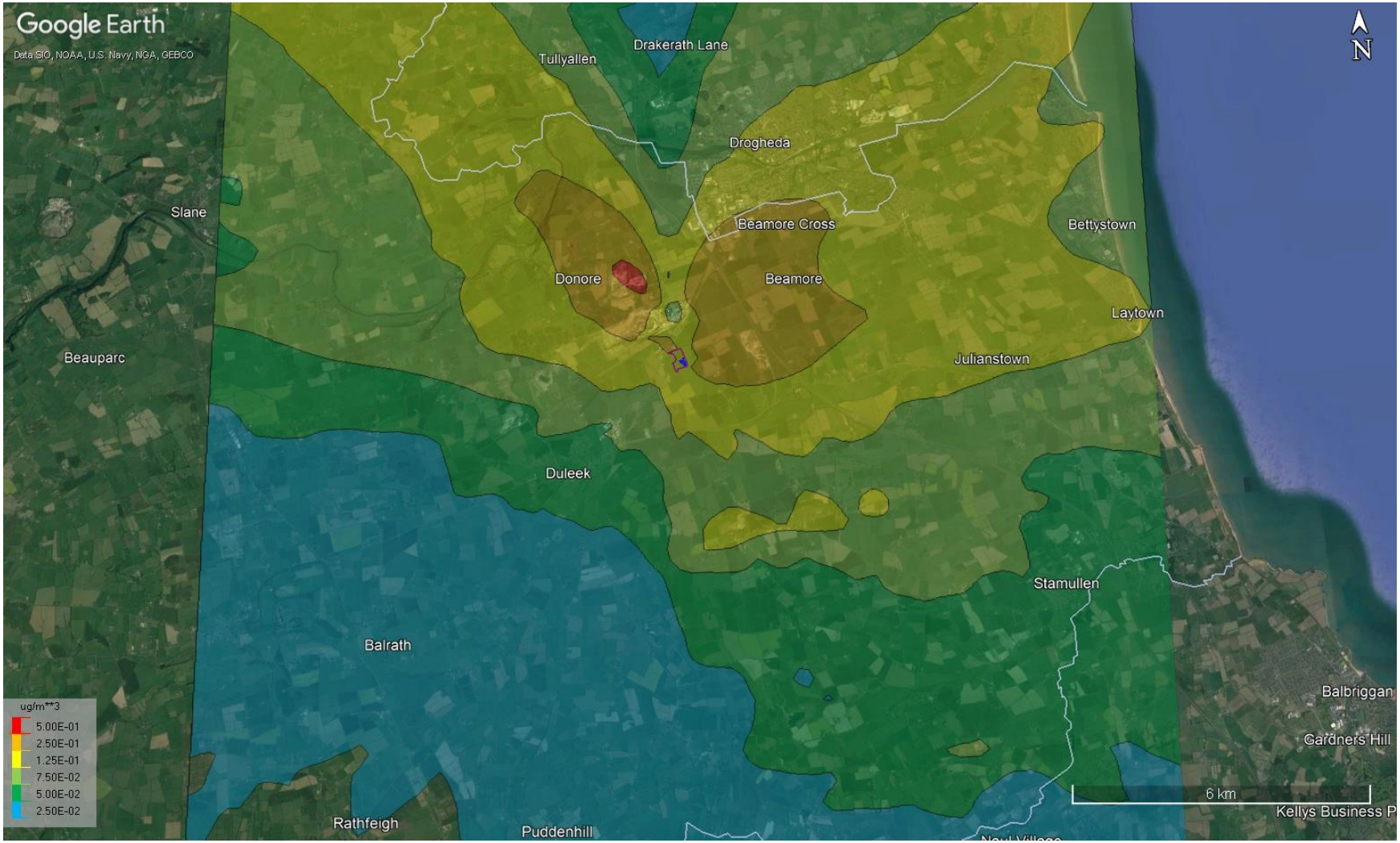

Figure 7: 90.4%ile of Daily Mean Ground Level Concentrations for PM_{10} at 35% Load (2019 Met Year) (Base Image from Google Earth)

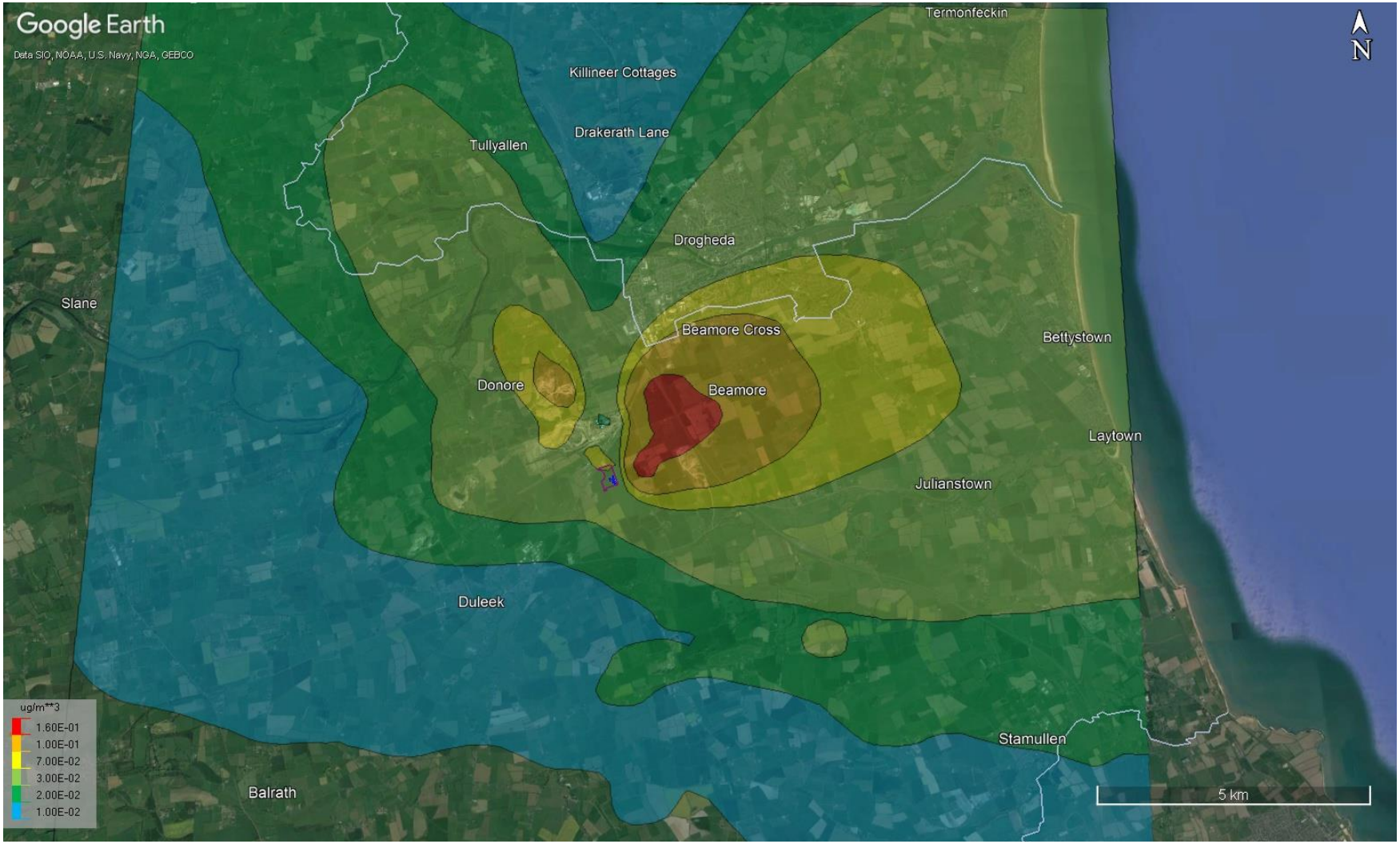

Figure 8: Annual Mean Ground Level Concentrations for PM_{10}/ $PM_{2.5}$ at 35% Load (2017 Met Year) (Base Image from Google Earth)

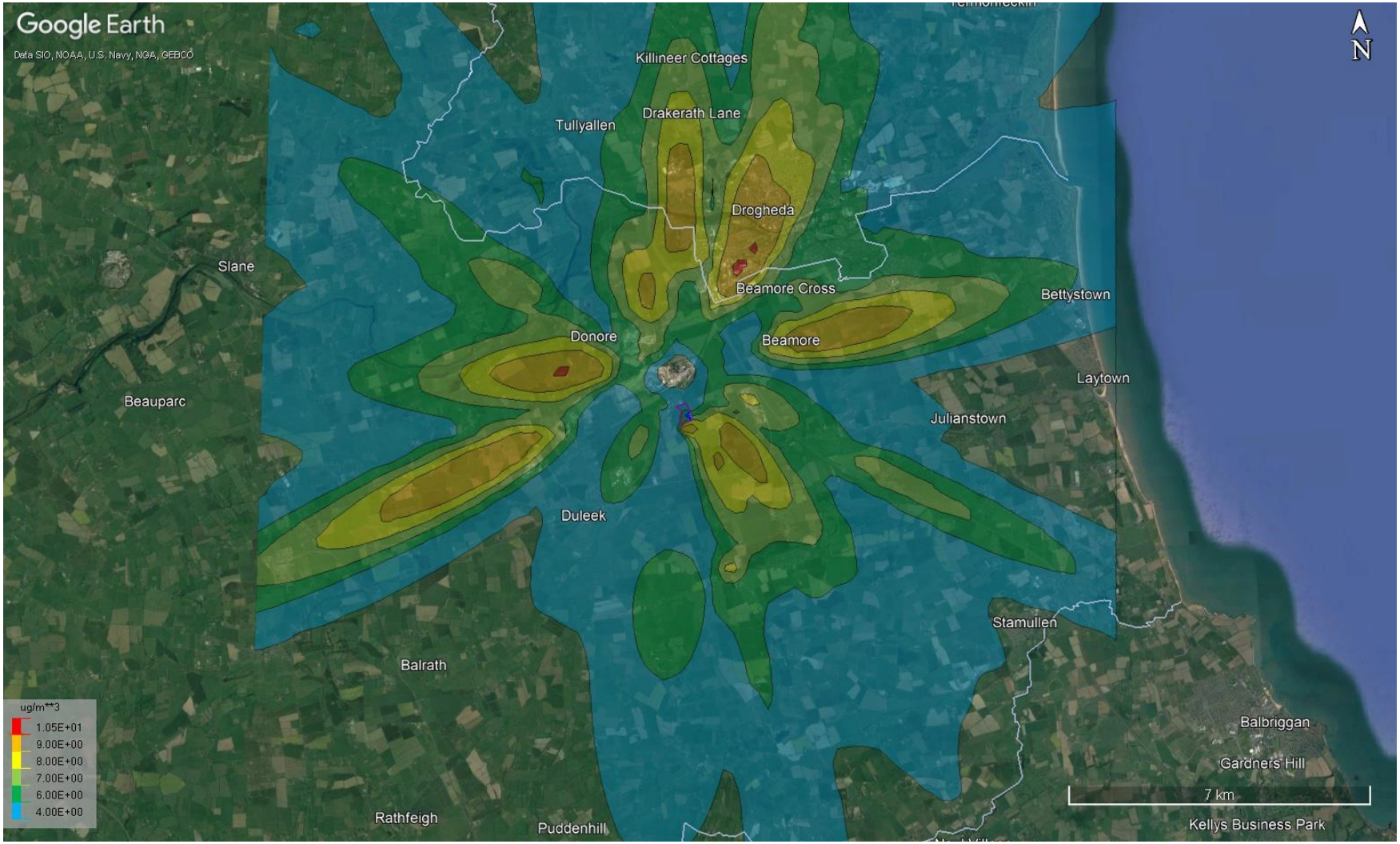

Figure 9: Hourly Mean Ground Level Concentrations for NH_3 at 35% Load (2019 Met Year) (Base Image from Google Earth)

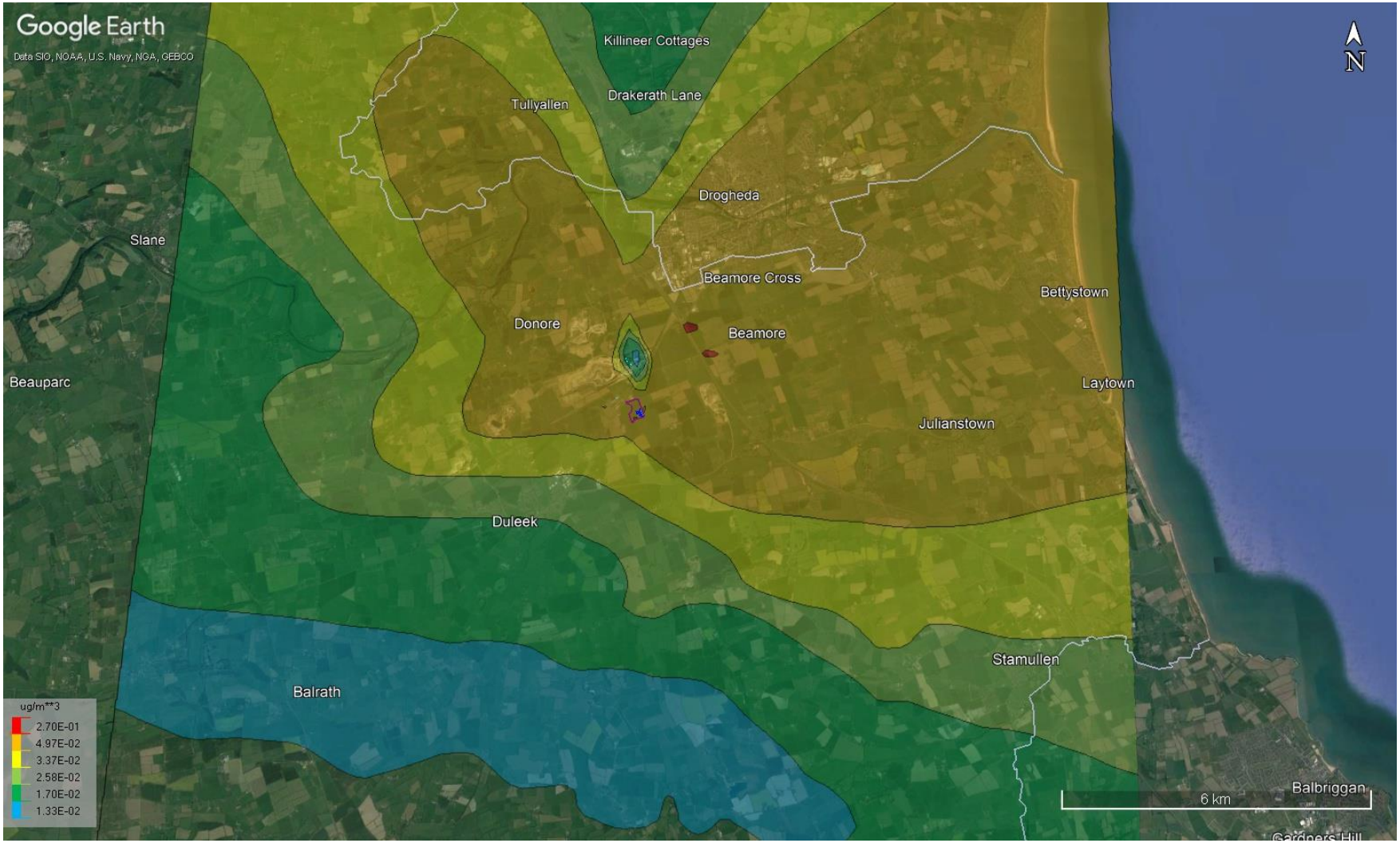

Figure 10: Annual Mean Ground Level Concentrations for NH_3 at 100% Load (2017 Met Year) (Base Image from Google Earth)

Appendix B
EPA Zone C - Ambient Air Quality Monitoring Results

The following tables outline ambient air quality monitoring results for EPA Zone C Monitoring stations (Other Cities and Large Towns). The results were obtained from the EPA Air Quality in Ireland Reports available at http://www.epa.ie/pubs/reports/air/quality/.

Table B.1 – EPA Air Quality Zone C Monitoring Stations: **NO_2 Annual Mean concentrations** (µg/m^3) for period 2017-2021

Year	Meath Navan	Kilkenny Seville Lodge	Portlaoise	Dundalk	Total Average
2017	-	5.2	10.8	-	
2018	-	6	11	14	
2019	23	5	11	12	
2020	19	4	11	10	
2021	21.90	4.20	7.90	10.73	**12.05**
	21.3	**4.9**	**10.3**	**10.4**	

Table B.2 – EPA Air Quality Zone C Monitoring Stations: **SO_2 Annual Mean concentrations** (µg/m^3) for period 2017-2021

Year	Ennis	Dundalk	Portlaoise	Total Average
2017	3.4		2.4	
2018	3.2	3.8	3	
2019	3.6	1.5	1.3	
2020	4.4	2	1.6	
2021	5.90	2.30	1.90	**2.85**
	4.1	**2.4**	**2.0**	

Table B.3 – EPA Air Quality Zone C Monitoring Stations: **CO 8-hour Annual Mean concentrations** (mg/m^3) for period 2017-2021

Year	Dundalk	Portlaoise	Total Average
2017	-	0.15	
2018	0.5	0.2	
2019	0.1	0.1	
2020	0.3	0.1	
2021	0.1	0.4	**0.220**
	0.25	**0.19**	

Table B.4 – EPA Air Quality Zone C Monitoring Stations: **PM_{10} Annual Mean concentrations** ($\mu g/m^3$) for period 2017-2021

Year	Meath Navan	Ennis	Portlaoise	Dundalk	Drogheda	Total Average
2017	-	15.8	9.5	-	-	
2018	-	16	11	15	-	
2019	-	18	15	14	-	
2020	14	20	12	13	-	
2021	13.5	19	19	11.7	10.7	**13.79**
	13.75	**17.76**	**13.43**	**13.75**	**10.7**	

Table B.5 – EPA Air Quality Zone C Monitoring Stations: **$PM_{2.5}$ Annual Mean concentrations** ($\mu g/m^3$) for period 2017-2021

Year	Navan	Ennis	Bray	Drogheda	Total Average
2017	-	10.6	5.2	-	
2018	-	10	6	-	
2019	11	7	14	-	
2020	8	14	5	-	
2021	8.2	14.7	5.6	6.1	**8.40**
	9.07	**11.26**	**7.16**	**6.10**	

Appendix C
Cumulative Assessment Emissions Data

Indaver Ireland Ltd. Emission Stack

The information outlined in Table C.1 was obtained from either Indaver's IE License (Licence No. W0167-03) or licence application form data, available from the EPA's website (http://www.epa.ie) .

Table C.1: Indaver Ireland Ltd. Emission Stack Data

Information	STACK A1-1
Emission point location (UTM Zone 29 Coordinates)	672276.8E, 5950829.4N
Minimum discharge height (m)	95.5
Height of stack above ground (m)	65
Diameter (m)	2
Normalised Volume to be emitted - max rate (Nm^3/hr)	183,700
Sulphur dioxide conc. - daily avg (mg/Nm^3)	50
Oxides of Nitrogen conc. - daily avg (mg/Nm^3)	200
Carbon monoxide conc. - daily avg (mg/Nm^3)	100
Dust/Particulates conc. - daily avg (mg/Nm^3)	10
Emissions rate: NOx (g/s)	10.21
Emissions rate: SO_2 (g/s)	2.55
Emissions rate: CO (g/s)	5.10
Emissions rate: Particulates (g/s)	0.51
Temperature: Avg (°C)	140
Periods of emission:	Continuous
CALCULATED DATA:	
Max discharge velocity (m/s)	24.6

Irish Cement Ltd. Emission Stacks

The information outlined in Table C.2 was obtained from either Irish Cement's IE License (Licence No P0030-06) or licence application form data, available from the EPA's website.

Table C.2: Irish Cement Ltd. Stack's Emissions Data

Information	STACK A2-01	STACK A2-02	STACK A2-03	STACK A2-08
Emission point coordinates (UTM Zone 29N)	672454.6E, 5951622.8N	672424E, 5951669.4N	672533.8E, 5951606.9N	672537.7E, 5951545N
Minimum discharge height (m)	145.2	153.37	95.03	168.2
Height of stack above ground (m)	98.01	103.04	48.09	123
Diameter (m)	2.38	3.7	1	3.75
Normalised Volume to be emitted max rate (Nm^3/hr)	49,000	650,000	31,000	650,000
Sulphur dioxide conc. - daily avg (mg/Nm^3)	50	390	390	50
Oxides of Nitrogen conc. - daily avg (mg/Nm^3)	500	500	500	500
Carbon monoxide conc. (daily avg) (mg/Nm^3)	1500	1500	1500	1500
Dust/Particulates - daily avg (mg/Nm^3)	20	20	20	20
Ammonia – daily average (mg/Nm^3)	N/A	50	N/A	50
Emissions rate: NO_x g/s	6.81	90.28	4.31	90.28
Emissions rate: SO_x g/s	0.68	9.03	3.36	9.03
Emissions rate: CO g/s	20.42	270.83	12.92	270.83
Emissions rate: Particulates g/s	0.27	3.61	0.17	3.61
Emissions rate: Ammonia g/s	N/A	9.03	N/A	9.03
Temperature - Avg (°C)	87	121	81	108
Periods of emission	Continuous	Continuous	Continuous	Continuous
CALCULATED DATA:				
Max discharge velocity (m/s)	4.03	24.235	14.22	22.815

Appendix D
Sensitivity Analysis Modelling Results

Operational Load Sensitivity Assessment Results

Nitrogen Dioxide Results – Process Contribution:

Pollutant	Parameter	Worst Case Year for Pollutant Parameter	100% Load	70% Load	35% Load
			Max conc. (µg/m3)	Max conc. (µg/m3)	Max conc. (µg/m3)
NO_x/NO_2	Max 99.8th Percentile of 1-hr concentrations	2021	42.9327	42.9277	39.62975
NO_x/NO_2	Max Annual concentration	2017	4.02846	4.0257	4.02087

Sulphur Dioxide Results –Process Contribution:

Pollutant	Parameter	Worst Case Year for Pollutant Parameter	100% Load	70% Load	35% Load
			Max conc. (µg/m3)	Max conc. (µg/m3)	Max conc. (µg/m3)
SO_2	Max 99.7th Percentile of 1-hr concentrations	2021	22.60252	22.602530	22.602550
SO_2	Max 99.2 Percentile Daily concentrations	2021	7.043589	7.04165	7.0393
SO_2	Max Annual concentration	2017	0.997520	0.99730	0.99708

Carbon Monoxide Results – Process Contribution:

Pollutant	Parameter	Worst Case Year for Pollutant Parameter	100% Load	70% Load	35% Load
			Max conc. (µg/m3)	Max conc. (µg/m3)	Max conc. (µg/m3)
CO	Max 8-hour rolling average concentration	2018	234.909	234.63414	234.25014

Particulate Results – Process Contribution:

Pollutant	Parameter	Worst Case Year for Pollutant Parameter	100% Load	70% Load	35% Load
			Max conc. (µg/m3)	Max conc. (µg/m3)	Max conc. (µg/m3)
PM_{10}	Max annual average concentration	2017	0.16997	0.16956	0.19599
PM_{10}	Max 90.4 Percentile of Daily concentrations	2019	0.590094	0.589	0.62845
$PM_{2.5}$	Max annual average concentration	2017	0.16997	0.16956	0.19599

Ammonia Results – Process Contribution:

Pollutant	Parameter	Worst Case Year for Pollutant Parameter	100% Load	70% Load	35% Load
			Max conc. (µg/m3)	Max conc. (µg/m3)	Max conc. (µg/m3)
NH_3	Max 1-hour average concentration	2019	12.8106	12.670	13.627
NH_3	Max annual average concentration	2017	0.27963	0.27903	0.27821

Attachment 5

Carbon Assessment Calculation

Carbon Assessment Calculation

SSE Generation Ireland Ltd
Planning Support
IE0312377-22-CA-0004, Issue: B

Issue date: **14 Jul 2023**

Document Sign Off

Carbon Assessment Calculation

SSE Generation Ireland Ltd
Planning Support
IE0312377-22-CA-0004, Issue: B

File No: IE0312377.22.220

CURRENT ISSUE					
Issue No: B	Date: 14 Jul 2023	Reason for issue: Planning			
Sign off	Originator	Checker	Reviewer	Approver	Customer Approval (if required)
Print name	ANNA.CROWLEY	AOIFE.OLEARY		PAUL.OSULLIVAN	
Signature	**Authorised Electronically**				
Date	13-Jul-2023	14 Jul 2023		14 Jul 2023	

PREVIOUS ISSUES							
Issue No	Date	Originator	Checker	Reviewer	Approver	Customer	Reason for issue
A	18/05/2023	ANNA. CROWLEY	AOIFE.OLEARY		PAUL. OSULLIVAN		Planning

DETAILS

Project Name	**Planning Support**	Project Number	**IE0312377**		
Customer Name	**SSE Generation Ireland Ltd**	Customer Project No.	**N/A**		
Document Number	**IE0312377-22-CA-0004**	Rev:	**B**	Date:	**13/07/2023**

1. Introduction & Objective

The purpose of this calculation is to determine the CO_2 equivalent greenhouse gas emissions from the proposed SSE 170 Megawatt electrical output (MWe) Open Cycle HVO Turbine (OCGT) Generation plant in Platin, Dunleek, Co. Meath. The scope covers (a) The operation of the plant and (b) The construction of the plant. In this document, the operation is considered first, followed by construction.

2. Methodology

Emission releasing activities can be split into three scopes, these are defined in Defra's Environmental Reporting Guidelines (Ref 4.2) and originate from ISO 14064-1 (Ref 4.3).

Scope 1 (Direct emissions): Emissions for activities owned or controlled by your organisation that release emissions into the atmosphere.

Scope 2 (Energy indirect): Emissions released into the atmoshere associated with your consumption of purchased electricity, heat, steam and cooling.

Scope 3 (Other indirect): Emissions that are a consequence of your actions, which occur at sources which you do not own or control and which are not classed as scope 2 emissions.

The GHG emissions can be reported in terms of the metric tonnes of carbon dioxide equivalent (CO_2e), or the metric tonnes of gas emitted (Ref 4.2).

The formula used to calculate GHG emissions is:

$$GHG\ Emissions = Activity\ data\ \times Conversion\ factor$$

CO_2e is a universal unit of measurement to indicate the Global Warming potential of the GHGs, therefore the overall quantity of emissions is reported in this format.

Scope 1 Emissions:

Scope 1 emissions are those associated with direct fuel consumption and refrigerant usage in the air conditioning units. Carbon dioxide equivalent for biofuel - hydrotreated vegetable oil (HVO) is taken from the UK Government 2022 GHG conversion factors (Ref 4.1).

There is a minor contribution from the use of refrigerant in the air conditioning units. A methodology from Defra's Envrionmental Reporting Guidelines (Ref 4.2, Annex C) is used to estimate the total carbon dioxide equivalent. Reporting of the gas emissions is given only in CO_2e as the fluorinated gases have a global warming influence themselves. The global warming potential (GWP) of the fluorinated gases is expressed in the CO_2e conversion factor.

Scope 2 Emissions:

Scope 2 covers those emissions associated with operational electricity use on the site. The UK Government conversion factors (Ref 4.1) are used to calculate the CO_2e associated to the electricity usage.

Scope 3 Emissions:

Scope 3 covers those emissions associated with delivery of fuel and materials to the site, water supply, the manufacture and recycling/disposal of materials, and commuting, flights and hotel stays taken by the workforce (for the sake of completeness the well to tank HVO embodied carbon will be taken into account under scope 3 emissions in the operational calculations.)The CO_2e for these emissions is estimated using UK Government 2022 GHG conversion factors (Ref 4.1).

3. Basis & Assumptions

The basis and assumptions are as follows:

• The fuel consumption of the plant is based on information received in correspondence with the client. The plant will be fuelled by HVO (hydrogenated vegetable oil) the exact type is Gd+ fuel. This will be the only fuel used and no backup fuel will be used. Maximum operational time for the combustion plants should be no more than 1800 hours each per annum.

• Maximum electricity usage is based on information received in correspondence with the client. Maximum electricity usage is 3650 MWh per annum.

• The travel distance for a tanker to transport fuel is estimated from Ringaskiddy Co. Cork to the site using the fastest/pre-agreed route shown in Appendix B. This carbon assessment is only considering the fuel used by the vehicle within this distance.

• The tanker transporting the fuel to the site is assumed to be covered under Scope 3 emissions, i.e. SSE Generation Ireland Ltd. Alternatively as SSE do not own it, if the vehicle transporting the fuel to the site is owned and operated by SSE Generation Ireland Ltd. these emissions would fall under scope 1.

• Specific information regarding the size and specification of the fuel transport vehicle is unknown, it is confirmed that the fuel will be transported by HVO fuelled vehicles. Both the BEIS Conversion Factors 2022 and BEIS COnversion Factors 2023 do not include conversion factors for HVO usage in road transportation. For this reason, diesel was used to provide a more conservative carbon assessment calculation. The 2022 Conversion Factors were used in lieu of the 2023 Conversion Factors due to the 2023 Conversion Factors being revised on the 28th June, shortly after being published. The 2022 Conversion Factors provide a more conservative estimate of the carbon emissions comparatively. The vehicles used were 3.5-33t HGV travelling from Ringaskiddy Cork to site.

• During operation, water treatment chemicals (WTC) were delivered to the site. Approximately 15,208kg, with 1250kg for dechloration, 350kg for antiscalant, 48kg for cleaning chemicals and 13,560kg for pH adjustment. The WTCs were assumed to be travelling in an 7.5-17t rigid HGV (diesel) in one trip annual. The WTCs travel distance is estimated from Rathcoole Dublin using the fastest/most likely route shown in Appendix B. This carbon assessment is only considering the fuel used by the vehicle within this distance.

• During operation, santiary waste water will be collected once a month. This is assumed to come from the Dublin Port so that distance in Appendix B is used and the waste is assumed to be collected in a HGV fuelled by diesel of size 3.5-33t articulated.

During the evaluation of GHG emissions from air conditioning equipment, the following assumptions are made:

• The entire quantity of refrigerant within the air conditioning units is equal to the charge capacity.

• Installation of the equipment is during the reporting period and the equipment is charged on site.

• The average annual leakage rate given in Defra's Environmental Reporting Guidelines (Ref 4.2, Annex C) are suitable to calculate the equipment leaks and service losses during the reporting period.

• Disposal emissions are neglected, as this is not expected to occur during the reporting period.

• The water used was calculated to be 73m3 per day equalling 26,645m3 per annum. The process waste water is calculated based off the total water usage and will be transported in a HGV with a capcity of 23,000litres.

• The well to tank HVO embodied carbon emissions were also included in the operational scope 3 emissions.

• Construction is assumed to operate 10 hours a day Monday through Friday, and a half day on Saturday.

• A conservative volumetric estimate of an Oxyacetylene Bottle of 100 L is taken; the client specifies that 0.3 bottles will be consumed per day on average

• The density of Oxyacetylene is taken as that of pure Acetylene, at a value of 0.729kg/L. For a conservative estimate, the full contents of the Oxyacetylene bottle are taken as Acetylene.

• The client specifies that a daily average of 5m3 of water will be used for construction per day. It is assumed that over the 900-day period, 2150m3 of water will be consumed.

• The quantities of steel and concrete that will be used, have been confirmed by the client.

• Carbon emissions from topsoil movement on site are neglected because the client specified that it is not removed from site. It will be assumed that the movement is incorporated in the construction fuel emission section.

• The density of concrete is taken as an average mid-density concrete from the online Engineering Toolbox: https://www.engineeringtoolbox.com/density-solids-d_1265.html.

• The imported filling material for construction (e.g. 6N stone) is assumed to be appropriately modelled by the "Aggregates" category for the construction material and waste conversion factors.

• Steel is assumed to be appropriately modelled by the "Metals" category for the construction material and waste conversion factors.

3. Basis & Assumptions continued

• The imported filling material, concrete and steel are assumed to be purchased as a "Primary material production," meaning that the materials are made from virgin stock.

• Carbon emissions due to acetylene delivery are assumed to be equivalent to diesel delivery.

• Based on data provided by the Central Statistics Office as of the 2016 Census , it is assumed the average commuting distance is 20.87 km in Meath. https://www.cso.ie/en/releasesandpublications/ep/p-cp6ci/p6cii/p6td/. In line with the traffic assessment set out in the Environmental Report for this project a 1.2 person per car occupancy for the construction phase is assumed. Commuting during the operational phase is not included as attendance at site will be minimal and the carbon impact is considered negligible compared to the operational fuel consumption.

4. Reference Documents

Reference Documents are as follows :

4.1. UK Government GHG Conversion Factors for Company Reporting (V1.0) 2022, Department for Business, Energy & Industrial Strategy

4.2 Department of Environment, Food and Rural Affairs (Defra) Environmental Reporting Guidelines: Including streamlined energy and carbon reporting guidance, March 2019, HM Government

4.3 ISO 41064-1:2018; Part 1: Specification with guidance at the organisation level for quantification and reporting of greenhouse gas emissions and removals.

4.4 Best Practice guidelines for the preparation of resource & waste management plans for construction & demolition projects, EPA, 2021

4.5 Hotel Footprinting Tool, produced by the International Tourism Partnership and Greenview. https://www.hotelfootprints.org/

• Table 1 in "Quantification of Material Wastage in Construction Industry of Pakistan: An Analytical Relationship between Building Types and Waste Generation" in the Journal of Construction in Developing Countries, lists the average wastage rate for construction materials in the UK. On average most materials are wasted at a rate of 5%. It is assumed that construction material in Ireland is wasted similarly at 5%. The client specifies that no imported filling material will be wasted.

• For the calculation of CO_2e produced due to material waste, it is assumed that all waste is recycled in a closed-loop process.

DETAILS

Project Name	**Planning Support**	Project Number	**IE0312377**		
Customer Name	**SSE Generation Ireland Ltd**	Customer Project No.	**N/A**		
Document Number	**IE0312377-22-CA-0004**	Rev:	**B**	Date:	**13/07/2023**

5. Results

A - Operation of Plant (1800 hours running on HVO (Possible Case))

Scope	Activity	kg CO_2e	Total kg CO_2e	Total Operational Impact (gCO_2e/kWh) of 170MWe plant operating for 1800hrs
1	Fuel Consumption	3,810,618	**3,813,834**	
	Air Conditioning Units	3,216		**145.6**
2	Electricity Usage	705,837	**705,837**	**Total Operational Impact (CO2e tonnes)**
3	Water Supply	3,970	**40,027,504**	
	WTT HVO Embodied Carbon	37,675,638		**44,547**
	Transport	2,347,896		

B - Construction of Plant

Scope	Activity	kg CO_2e	Total kg CO_2e	Total Construction Impact for 30 months of operation (tonnes CO_2e)
1	Diesel Consumption	431,912	**484,953**	
	Acetylene Consumption	53,042		**10,698**
2	Electricity Usage	14,273	**14,273**	
3	Water Supply	534	**10,199,219**	
	Imported Filliing Material	181,622		
	Concrete	929,240		
	Steel	8,590,490		
	Delivery of Filling Material	91,313		
	Delivery of Concrete	40,670		
	Delivery of Steel	4,019		
	Delivery of Fuel	379		
	Workforce Commute	301,492		
	Flights	16,888		
	Hotels	42,120		
	Waste of Materials	453		

DETAILS

Project Name	**Planning Support**	Project Number	**IE0312377**		
Customer Name	**SSE Generation Ireland Ltd**	Customer Project No.	**N/A**		
Document Number	**IE0312377-22-CA-0004**	Rev:	**B**	Date:	**13/07/2023**

6. Conclusions & Recommendations

This Carbon Assessment Calculation for the proposed SSE 170MWe OCGT Generation plant has determined, based on client information and listed assumptions, that:

(a) It is *estimated* that the annual operation of the plant will produce *approximately* 44,547 tonnes of CO_2e.

(b) It is *estimated* that the 30-month construction of the plant will produce *approximately* 10,698 tonnes of CO_2e.

CALCULATION INPUT DATA

Project Name	**Planning Support**	Project Number	**IE0312377**		
Customer Name	**SSE Generation Ireland Ltd**	Customer Project No.	**N/A**		
Document Number	**IE0312377-22-CA-0004**	Rev:	**B**	Date:	**13/07/2023**

1.0 Scope 1 Emissions - Operational Phase

The scope 1 emissions for this project are calculated using the maximum fuel usage in the plant and and minor contributions from the refrigerant consumption in the air conditioning units.

1.1 Operational data for the plant

	Value	Unit	Source
Operation Time	1800	hr per annum	Client information
Fuel Type	**HVO**		Client Information
Fuel Consumption	107,100	m^3 per annum	Client information
Mass of HVO	107,100,000	litres per annum	

1.3 Fuel conversion factors

Fuel	kg CO_2e/L	Source
HVO	0.03558	Ref 4.1 (Appendix A; 2.8)

1.3 Air Conditioning Units

10 no. HVAC units to be installed (information provided by the client) at Platin. The refrigerant charge capacity data from units at SSE's sites in Rhode and Tawnaghmore is used, as the units to be installed at Platin are similiar.

As per Defra's Environmental reporting guidelines (Ref 4.2) the 'screening method' will be the simplest way to calculate the GHG emissions from use of air conditioning equipment. Using this method, all the air conditioning equipment is assumed to be 'Medium Stationary Air Conditioning'. The details section states the assumptions for this methodology.

HVAC No.	Refrigerant	Type	Charge Capacity (kg)	Installation Emission Factor %	Annual Leak Rate %	Total $kgCO_2e$
1	R410A	HFC Blend	3.8	1%	6%	555
2	R410A	HFC Blend	3.8	1%	6%	555
3	R410A	HFC Blend	1.8	1%	6%	263
4	R410A	HFC Blend	1.8	1%	6%	263
5	R410A	HFC Blend	1.8	1%	6%	263
6	R410A	HFC Blend	1.8	1%	6%	263
7	R410A	HFC Blend	1.8	1%	6%	263
8	R410A	HFC Blend	1.8	1%	6%	263
9	R410A	HFC Blend	1.8	1%	6%	263
10	R410A	HFC Blend	1.8	1%	6%	263
Total						**3216**

1.4 Refrigerant conversion factors

Activity	Emission	$kgCO_2e$	Unit	Source
Kyoto protocol - blends	R410A	2088	per kg	Ref 4.1 (Appendix A; 1.2)

CALCULATION INPUT DATA

Project Name	**Planning Support**		Project Number	**IE0312377**	
Customer Name	**SSE Generation Ireland Ltd**		Customer Project No.	**N/A**	
Document Number	**IE0312377-22-CA-0004**		Rev: **B**	Date:	**13/07/2023**

1.5 Scope 1 Total Emissions

	kg CO_2e	
Fuel usage	**3,810,618**	per annum
Air Conditioning usage	**3216**	per annum

2.0 Scope 2 Emissions - Operational Phase

Scope 2 emissions account for the projected electricity consumption of the plant.

2.1 Operational data for the plant

Electricity usage	3650	MWh per annum	Client Information
	3,650,000	kWh per annum	

2.2 Electricity CO_2 conversion factors

	kg CO_2e	**Unit**	**Source**
Electricity Generation	0.19338	per kWh	Ref 4.1 (Appendix A; 1.3)

2.3 Scope 2 Total Emissions

Acitivity	**kg CO_2e**	
Electricity usage	**705,837**	per annum

3.0 Scope 3 Emissions - Operational Phase

The aim of this section is to calculate the scope 3 emissions, these are the emissions associated with transporting the fuel from different ports to the site in Platin. The details section will state the assumptions used.

3.1 Water supply

	Value	**Unit**	**Source**
Water Usage - Total	26,645	m^3 per annum	Client information

3.2 Water supply conversion factors (Ref 4.1)

	Value	**Unit**	**Source**
Water Supply	0.149	per m^3	Ref 4.1 (Appendix A; 2.2)

3.3 HGV Travel data HVO

Distance Travelled (single trip)	302	km	Refer to Appendix B
Capacity of fuel tankers	23,000	Litres	Assumption
Number of 100% laden journeys	4657	per annum	Operation at maximum capacity
Total km per year (100% laden)	1,406,270	km per annum	
Number of 0% laden journeys	4657	per annum	Operation at maximum capacity
Total km per year (0% laden)	1,406,270	km per annum	

3.3 HGV Travel data water treatment chemicals

Distance Travelled (single trip)	56.7	km	Refer to Appendix B
Yearly Quantites	15208	kg	Chemical consumption
Capacity of HGV tankers	17,000	kg	Assumption upper range of HGV being used
Number of 100% laden journeys	1	per annum	Operation at maximum capacity
Total km per year (100% laden)	56.7	km per annum	
Number of 0% laden journeys	1	per annum	Operation at maximum capacity
Total km per year (0% laden)	56.7	km per annum	

CALCULATION INPUT DATA

Project Name	**Planning Support**		Project Number	**IE0312377**	
Customer Name	**SSE Generation Ireland Ltd**		Customer Project No.	**N/A**	
Document Number	**IE0312377-22-CA-0004**		Rev: **B**	Date:	**13/07/2023**

3.3 HGV Travel data for santiary waste water

Distance Travelled (single trip)	47.2	km	Refer to Appendix B
Capacity of HGV tankers	23,000	litres	Client conservative estimate
Number of 100% laden journeys	12	per annum	Once a month
Total km per year (100% laden)	566.4	km per annum	
Number of 0% laden journeys	12	per annum	Once a month
Total km per year (0% laden)	566.4	km per annum	

3.4 HGV Travel data process waste water

Distance Travelled (single trip)	47.2	km	Refer to Appendix B
Yearly Quantites	26645000	litres	water usage
Capacity of HGV tankers	23,000	litres	Assumption upper range of HGV being used
Number of 100% laden journeys	1158	per annum	Operation at maximum capacity
Total km per year (100% laden)	54,680.2	km per annum	
Number of 0% laden journeys	1158	per annum	Operation at maximum capacity
Total km per year (0% laden)	54,680.2	km per annum	

3.4 Well to Tank HVO fuel Embodied Carbon

	Value	**Unit**	**Source**
HVO Usage - Total	107,100,000	litres per annum	Client information

3.5 Freighting goods conversion factors (Ref 4.1)

Activity	**Type**	**kg CO_2e**	**Unit**	**Source**
HGV (diesel)	Rigid >7.5-17tonnes(100% laden)	0.71483	per km	Ref 4.1 (Appendix A; 1.4.1)
	Rigid >7.5-17tonnes (0% laden)	0.55763	per km	Ref 4.1 (Appendix A; 1.4.1)
HGV (diesel)	Articulated 3.5t-33t (100% laden)	0.96112	per km	Ref 4.1 (Appendix A; 1.4.1)
	33t (0% laden)	0.64531	per km	Ref 4.1 (Appendix A; 1.4.1)

3.6 WTT HVO Embodied Carbon conversion factors (Ref 4.1)

	kg CO_2e	**Unit**	**Source**
WTT HVO Embodied carbon	0.35178	per litres	Ref 4.1 (Appendix A; 1.4.2

Activity	**kg CO_2e**	
Water Usage	3,970	per annum
HGV Transport (100% laden) (HV	1,351,594	per annum
HGV Transport (0% laden) (HVO)	907,480	per annum
HGV Transport (100% laden) (WT	41	per annum
HGV Transport (0% laden) (WTC)	32	per annum
HGV Transport (100% laden) (Sa	544	per annum
HGV Transport (0% laden) (santia	366	per annum
HGV Transport (100% laden) (Pro	52,554	perannum
HGV Transport (0% laden) (Proce	35,286	per annum
WTT HVO fuel Embodied Carbon	37,675,638	per annum
Total Emissions from Transport	2,347,896	per annum
Total Emissions	**40,027,504**	per annum

CALCULATION INPUT DATA

Project Name	**Planning Support**	Project Number	**IE0312377**		
Customer Name	**SSE Generation Ireland Ltd**	Customer Project No.	**N/A**		
Document Number	**IE0312377-22-CA-0001**	Rev:	**B**	Date:	**13/07/2023**

1.0 Scope 1 Emissions - Construction Phase

The scope 1 emissions for this project are calculated using the expected daily average consumption from Plant Movements and Craneage, Diesel Generators, Diesel Burning Equipment, and Car/Truck Movements.

1.1 Operational data for construction

	Value	Unit	Source
Construction Duration	30	months	IE0312377-22-RP-0013
Weekly Construction Hours	57	hours	Assumption
Total Construction Hours	7410	hours	
Total Construction Days	717	days	Assumption
Fuel Type	**Gas Oil**		
Daily Fuel Consumption	218.5	L per day	Client Information
Total Fuel Consumption	156.57	m^3 per construction period	
Fuel Type	**Acetylene**		
Daily Fuel Consumption	30	L per day	Client Information and Assumption
Total Fuel Consumption	21.5	m^3 per construction period	Client information
Density of fuel	0.729	kg/L	GESTIS Database (http://gestis-en.itrust.de/)
Mass of fuel	15,671	kg per construction period	

1.2 Net CO_2 Produced - Acetylene

Acetylene	Value	Unit	Source
Net CO_2	**53,042**	kg CO_2	Ref 4.1 (Appendix A; 2.1)

1.3 Fuel conversion factor - Gas Oil

Fuel	kg CO_2e	Unit	Source
Gas Oil	2.75857	per litre	Ref 4.1 (Appendix A; 1.1)

1.4 Scope 1 Total Emissions

	kg CO_2e
Gas Oil	**431,912**
Acetylene	**53,042**
Total	**484,953**

2.0 Scope 2 Emissions - Construction Phase

Scope 2 emissions account for the projected electricity consumption of construction.

2.1 Operational data for construction

	Value	Unit	Source
Electricity usage	103	kWh per day	Client Information
	73,807	kWh per construction period	

2.2 Electricity conversion factor

	kg CO_2e	Unit	Source
Electricity Generation	0.19338	per kWh	Ref 4.1 (Appendix A; 1.3)

2.3 Scope 2 Total Emissions

Acitivity	kg CO_2e
Electricity usage	**14,273**

CALCULATION INPUT DATA

Project Name	**Planning Support**	Project Number	**IE0312377**		
Customer Name	**SSE Generation Ireland Ltd**	Customer Project No.	**N/A**		
Document Number	**IE0312377-22-CA-0001**	Rev:	**B**	Date:	**13/07/2023**

3.0 Scope 3 Emissions - Construction Phase

This section calculates the scope 3 emissions, these are all emissions associated with transporting the fuel from Dublin port to the site in Platin, water usage, production of construction materials, delivery of construction materials, land and air transport, hotel stays and waste disposal. The details section will state the assumptions used.

3.1 Water supply

	Value	Unit	Source
Water Usage	5	m^3 per day	Client Specification
	3583	m^3 per construction period	Client Specification and Assumption

3.2 Water supply conversion factors (Ref 4.1)

	kg CO_2e	Unit	Source
Water Supply	0.149	per m^3	Ref 4.1 (Appendix A; 2.2)

3.3 Construction Materials

		Value	Unit	Source
Removed Ground Material		25,412	m^3 per construction period	Client Specification
Imported Filling Material		11,716	m^3 per construction period	Client Specification
	Density	2.0	tonnes per m^3	Client Specification
	Mass	23,432	tonnes per construction period	
Concrete		4702	m^3 per construction period	Client Specification
	Density	1.5	tonnes per m^3	Assumption
	Mass	7053	tonnes per construction period	
Steel		2138	tonnes per construction period	Client Specification

3.4 Construction material conversion factors

	kg CO_2e	Unit	Source
Removed Ground Material	0	per m^3	Client Specification: Plan to reuse all excavated material onsite
Imported Filling Material	7.75	per tonne	Ref 4.1 (Appendix A; 2.3 - Aggregates)
Concrete	131.75	per tonne	Ref 4.1 (Appendix A; 2.3 - Concrete)
Steel	4018.00	per tonne	Ref 4.1 (Appendix A; 2.3 - Metals)

3.5 Delivery of construction materials

	Mass	Unit
Imported Filling Material	23,432	tonnes
Concrete	4702	m^3
Steel	2138	tonnes

Imported Filling Material	Value	Unit	Source
Distance Travelled (single trip)	48.5	km	Refer to Appendix B
Capacity of HGV	20	tonnes	Assumption
Number of 100% laden journeys	1,172	per construction period	
Total km (100% laden)	56,842	km per construction period	
Number of 0% laden journeys	1,172	per construction period	
Total km (0% laden)	56,842	km per construction period	

CALCULATION INPUT DATA

Project Name	**Planning Support**	Project Number	**IE0312377**
Customer Name	**SSE Generation Ireland Ltd**	Customer Project No.	**N/A**
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Concrete	**Value**	**Unit**	**Source**
Distance Travelled (single trip)	48.5	km	Refer to Appendix B
Capacity of HGV	9	m^3	Assumption
Number of 100% laden journeys	522	per construction period	
Total km (100% laden)	25,317	km per construction period	
Number of 0% laden journeys	522	per construction period	
Total km (0% laden)	25,317	km per construction period	

Steel	**Value**	**Unit**	**Source**
Distance Travelled (single trip)	47.2	km	Refer to Appendix B
Capacity of HGV	40	tonnes	Assumption
Number of 100% laden journeys	53	per construction period	
Total km (100% laden)	2,502	km per construction period	
Number of 0% laden journeys	53	per construction period	
Total km (0% laden)	2,502	km per construction period	

3.6 Delivery of Fuel

	Value	**Unit**	**Source**
Distance Travelled (single trip)	47.2	km	Refer to Appendix B
Capacity of fuel tankers	35,000	Litres	Client Information
Number of 100% laden journeys	5	per construction period	Including both Gas Oil and Acetylene
Total km (100% laden)	236	km per construction period	
Number of 0% laden journeys	5	per construction period	Including both Gas Oil and Acetylene
Total km (0% laden)	236	km per construction period	

3.7 Freighting goods conversion factors (Ref 4.1)

Activity	**Type**	**kg CO_2e**	**Unit**	**Source**
HGV (diesel)	Articulated >3.5 - 33t (100% laden)	0.96112	per km	Ref 4.1 (Appendix A; 1.4.1)
	Articulated >3.5 - 33t (0% laden)	0.64531	per km	Ref 4.1 (Appendix A; 1.4)

3.8 Construction Workforce - Commute

	Value	**Units**	**Source**
Size of Workforce	60	personnel	Confirmed by client
Car Occupancy	1.2		Assumption
Number of Cars	50	cars	
Average Commuting Distance	20.87	km per car per day	Assumption
Total Distance	1,632,332	km per construction period	Assuming work week is Mon - Sat

3.9 Commuting conversion factors (Ref 4.1)

Activity	**Type**	**kg CO_2e**	**Unit**	**Source**
Car (Petrol)	Medium car	0.18470	per km	Ref 4.1 (Appendix A; 2.4)

3.10 Flights

	Value	**Units**	**Source**
Total Distance	110,000	km per construction period	Client Information

3.11 Flights conversion factors (Ref 4.1)

Activity	**Type**	**kg CO_2e**	**Unit**	**Source**
Flights	Short-haul; Average Passenger	0.15353	per passenger km	Ref 4.1 (Appendix A; 2.5)

CALCULATION INPUT DATA

Project Name	**Planning Support**	Project Number	**IE0312377**	
Customer Name	**SSE Generation Ireland Ltd**	Customer Project No.	**N/A**	
Document Number	**IE0312377-22-CA-0001**	Rev: **B**	Date:	**13/07/2023**

CALCULATION INPUT DATA

Project Name	**Planning Support**		Project Number	**IE0312377**	
Customer Name	**SSE Generation Ireland Ltd**		Customer Project No.	**N/A**	
Document Number	**IE0312377-22-CA-0001**		Rev: **B**	Date:	**13/07/2023**

3.12 Hotels

	Value	Units	Source
Rooms	10	rooms per week	Client Information
	60	nights per week	Assumption: 6 nights per week per person
	7,800	nights per construction period	

3.13 Hotel conversion factors (Ref 4.1)

Activity	Country	kg CO_2e	Unit	Source
Hotel stay	Ireland	5.4	room per night	Ref 4.5 (Appendix A; 2.6)

3.14 Material waste

	Value	Unit	Source
Percent Material Waste	5	%	Assumption
Wasted Concrete	353	tonnes	
Wasted Steel	107	tonnes	

3.15 Material waste conversion factors (Ref 4.1)

	kg CO_2e	Unit	Source
Wasted Concrete	0.9847	tonnes	Ref 4.1 (Appendix A; 2.7 - Assumed Closed Loop)
Wasted Steel	0.9847	tonnes	Ref 4.1 (Appendix A; 2.7 - Assumed Closed Loop)

3.16 Scope 3 Total Emissions

Activity	kg CO_2e
Water Supply	534
Removed Material	-
Imported Material	181,622
Concrete	929,240
Steel	8,590,490
Delivery of Filling. (100% laden)	54,632
Delivery of Filling. (0% laden)	36,681
Delivery of Concrete (100% laden)	24,333
Delivery of Concrete (0% laden)	16,337
Delivery of Steel (100% laden)	2,404
Delivery of Steel (0% laden)	1,614
Delivery of Fuel (100% laden)	227
Delivery of Fuel (0% laden)	152
Workforce Commute	301,492
Flights	16,888
Hotels	42,120
Wasted Concrete	347
Wasted Steel	105
Total Emissions	10,199,219

APPENDIX A SUPPORTING INFORMATION

Project Name	**Planning Support**	Project Number	**IE0312377**		
Customer Name	**SSE Generation Ireland Ltd**	Customer Project No.	**N/A**		
Document Number	**IE0312377-22-CA-0004**	Rev:	**B**	Date:	**13/07/2023**

1.1 Conversion factors for Fuels (Ref 4.1)

Fuel	Unit	Total kg CO_2e per unit	kg CO_2e of CO_2 per unit	kg CO_2e of CH_4 per unit	kg CO_2e of N_2O per unit
Gas oil	tonnes	3230.28	3,190.00	3.29	36.99
	litres	2.7586	2.72417	0.00281	0.03159
	kWh (Net CV)	0.27	0.26978	0.00028	0.00313
	kWh (Gross CV)	0.26	0.25359	0.00026	0.00294

1.2 Conversion factors for air conditioning units (Ref 4.1)

			Emissions including only Kyoto products	Emissions including only non-Kyoto products	Total emissions including non-Kyoto products
Activity	Emission	Unit	Total kg CO_2e per unit	Total kg CO_2e per unit	Total kg CO_2e per unit
Blends	R410A	kg	2088		2088

1.3 Conversion factors for electricity usage (Ref 4.1)

Activity	Country	Unit	Year	Total kg CO_2e per unit	
Electricity generated	Electricity: UK	kWh	2022	0.19338	

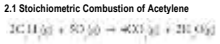
1.4.1 Conversion factors for freighting goods (Ref 4.1)

			0% Laden	100% Laden
Activity	Type	Unit	Total kg CO_2e per unit	Total kg CO_2e per unit
HGV (all diesel)	Rigid (>3.5 - 7.5 tonnes)	tonne.km		0.26396
		km	0.46338	0.54291
		miles	0.74574	0.87373
	Rigid (>7.5 tonnes-17 tonnes)	tonne.km		0.14556
		km	0.55763	0.71483
		miles	0.89742	1.15041
	Rigid (>17 tonnes)	tonne.km		0.1255
		km	0.79097	1.13291
		miles	1.27294	1.82324
	All rigids	tonne.km		0.13346
		km	0.69215	0.95522
		miles	1.11389	1.53726
	Articulated (>3.5 - 33t)	tonne.km		0.07428
		km	0.64531	0.96112
		miles	1.03851	1.54675
	Articulated (>33t)	tonne.km		0.05989
		km	0.65677	1.08375
		miles	1.05696	1.74412
	All artics	tonne.km		0.06017
		km	0.6563	1.0787
		miles	1.0562	1.736
	All HGVs	tonne.km		0.07384
		km	0.67032	1.02944
		miles	1.07877	1.65671

1.4.2 Conversion factors for freighting goods (HVO) (Ref 4.1)

			Total kg CO_2e per unit
WTT-Biofuel	Biodiesel HVO	litres	0.35178

2.1 Stoichiometric Combustion of Acetylene



Molecular Weight of C2H2 = 26kg/kgmol
Molecular Weight of CO2 = 44kg/kgmol

2.2 Conversion factors for Water supply (Ref 4.1)

Activity	Type	Unit	Total kg CO_2e per unit
Water supply	Water supply	cubic metres	0.149
		million litres	149.0

2.3 Conversion factors for Construction materials (Ref 4.1)

			Primary material production	Closed-loop source
Activity	Material	Unit	Total kg CO_2e per unit	Total kg CO_2e per unit
Construction	Aggregates	tonnes	7.75	3.19
	Average construc	tonnes	80.34	
	Asbestos	tonnes	27.00	
	Asphalt	tonnes	39.21	28.65
	Bricks	tonnes	241.75	
	Concrete	tonnes	131.75	3.19
	Insulation	tonnes	1,861.75	1,852.08
	Metals	tonnes	4,018.00	1,571.27
	Soils	tonnes		0.98
	Mineral oil	tonnes	1,401.00	676.00
	Plasterboard	tonnes	120.05	32.17
	Tyres	tonnes	3,335.57	
	Wood	tonnes	312.61	112.97

2.4 Conversion factors for Commuting (Ref 4.1)

			Petrol			
Activity	Type	Unit	Total kg CO_2e per unit	kg CO_2e of CO_2 per unit	kg CO_2e of CH_4 per unit	kg CO_2e of N_2O per unit
Cars (by size)	Small car	km	0.14652	0.14584	0.00032	0.00036
		miles	0.2358	0.23471	0.00051	0.00058
	Medium car	km	0.1847	0.18402	0.00032	0.00036
		miles	0.29724	0.29615	0.00051	0.00058
	Large car	km	0.27639	0.27571	0.00032	0.00036
		miles	0.4448	0.44371	0.00051	0.00058
	Average car	km	0.17048	0.1698	0.00032	0.00036
		miles	0.27436	0.27327	0.00051	0.00058

2.5 Conversion factors for Air Travel (Ref 4.1)

			With RF			
Haul	Class	Unit	Total kg CO_2e per unit	kg CO_2e of CO_2 per unit	kg CO_2e of CH_4 per unit	kg CO_2e of N_2O per unit
Domestic, to/from UK	Average passenger	passenger.km	0.24587	0.24455	0.0001	0.00122
Short-haul, to/from UK	Average passenger	passenger.km	0.15353	0.15276	0.00001	0.00076
	Economy class	passenger.km	0.15102	0.15026	0.00001	0.00075
	Business class	passenger.km	0.22652	0.22539	0.00001	0.00112

2.6 Conversion factors for Hotels (Ref 4.5)

2.7 Conversion factors for Waste (Ref 4.1)

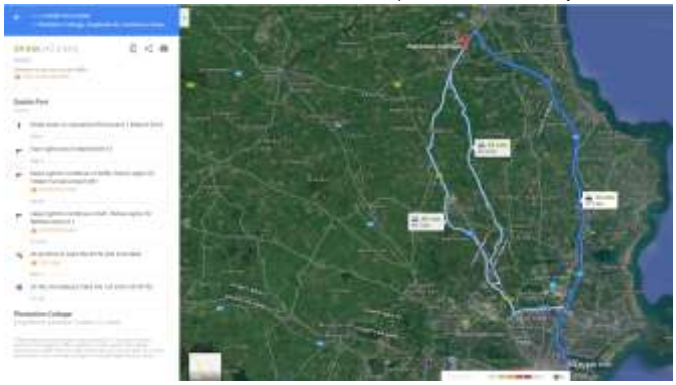
			Re-use	Open-loop	Closed-loop
Activity	Waste type	Unit	Total kg CO_2e per unit	Total kg CO_2e per unit	Total kg CO_2e per unit
Construction	Aggregates	tonnes		0.9847	0.985
	Average construct	tonnes		0.985	0.985
	Asbestos	tonnes			
	Asphalt	tonnes		0.985	0.985
	Bricks	tonnes		0.985	
	Concrete	tonnes		0.985	0.985
	Insulation	tonnes			0.985
	Metals	tonnes			0.985
	Soils	tonnes			0.985
	Mineral oil	tonnes			21.280
	Plasterboard	tonnes			21.280
	Tyres	tonnes			21.280
	Wood	tonnes			21.280

2.8 Conversion Factors for Biofuels (Ref 4.1)

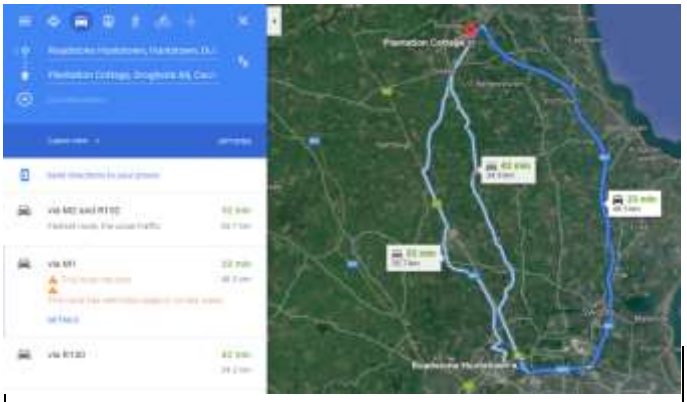
Fuel	Unit	Total kg CO_2e per unit
Biodiesel HVO	litres	0.03558
	GJ	1.03677
	kg	0.04562

Project Name	**Planning Support**	Project Number	**IE0312377**		
Customer Name	**SSE Generation Ireland L**	Customer Project No.	**N/A**		
Document Number	**IE0312377-22-CA-0004**	Rev:	**B**	Date:	**13/07/2023**

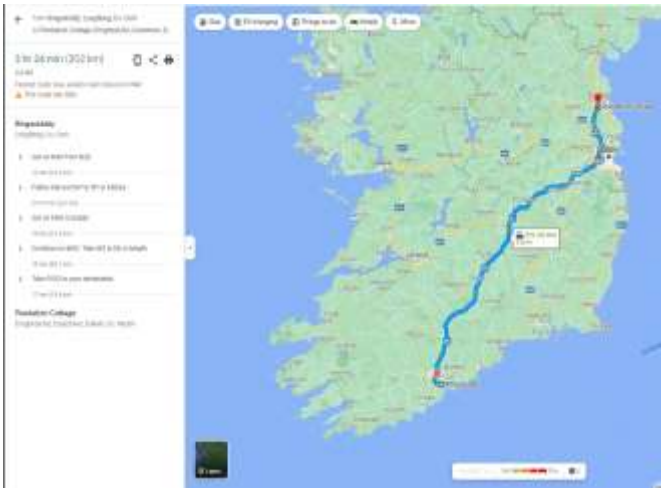
Estimation of Distance to Site for Steel and fuel for construction as well as process waste water and santiary waste water



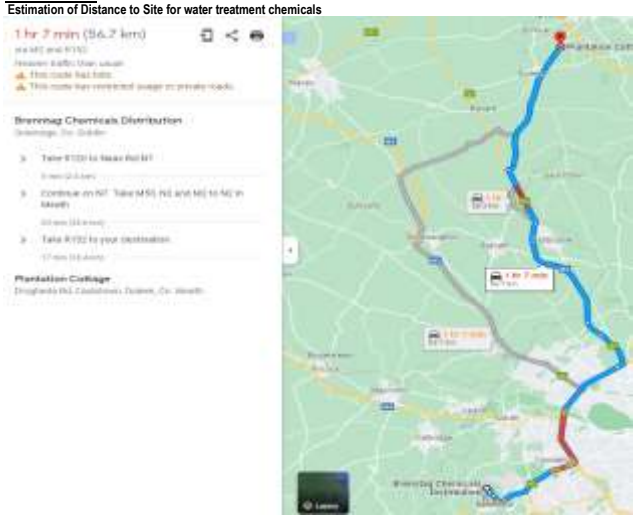
Estimation of Roadstone Distance to Site for Filling Material and Concrete



Estimation of Distance to Site for HVO fuel



Estimation of Distance to Site for water treatment chemicals



Attachment 6

AECOM Drainage Engineering Report

Platin Power Generating Report

Drainage Engineering Report

SSE

Project number: 60695232
60695232_ACM_RP_DR_01_0

06 July 2023

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
Oisin Kelm	Conor Cooney	David Lee	Conor Cooney

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	22 May 2023	Draft	Y	TBC	TBC
1	07 June 2023	Update	Y	TBC	TBC
2	06 July 2023	Planning	Y	Conor Cooney	Energy Practice Lead Ireland

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1. Introduction

1.1 Report Purpose

This report has been prepared in support of an SSE Generation Ireland Ltd planning application to Meath County Council (MCC) for a Power Generating Plant in Platin, Ireland.

The report will outline the design calculations for the proposed drainage system, as well as the Q-bar calculations for the greenfield run-off for the site to demonstrate the MCC planning requirements in relation to surface water have been satisfied.

Additionally, supplementary information on the technical specification of the proposed flow control devices and full retention separators will be provided.

The development proposals are outlined in the drainage drawing contained within Appendix A of the report.

2. Surface Water Design Calculations and Modelling Results

2.1 Surface Water Modelling Package

The drainage model for the site was constructed using the industry standard Micro Drainage Windes Program by XP Solutions.

The model was constructed to assess the proposed network against varying storm intensities to determine performance under extreme storm event conditions.

The purpose of the drainage model is to validate the proposed design.

2.2 Rainfall Inputs

Rainfall inputs were extracted from the Flood Studies Report (FSR) mapping.

2.3 Network Analysis – Model Construction

The drainage model was constructed using the Micro Drainage 'DrawNet' modelling package.

Factors such as storage and online restrictions were then incorporated into the model using the Micro Drainage 'Simulation' package.

Details include:

- Infiltration trenches representing the filter trenches;
- Storage tanks representing the run-off storage achieved in the voids within the gravelled areas, and;
- Hydro-brake flow restriction representing the flow control devices.

It should also be noted that various elements of the model includes the rationalising of elements of the drainage networks. AECOM consider that these alterations are normal and standard for this type of modelling.

A plan showing the constructed model can be found enclosed later within this section. This details the location of the storage and the online controls incorporated into the design.

2.4 Network Simulation

The following table identifies the design parameters relating to the network simulations undertaken through the Micro Drainage modelling packages. These modelled a series of winter and summer rainfall events ranging in duration from some 15 min – 10880 min.

The simulation criteria are outline in Table 3.1 below.

TABLE 3.1 | Network Simulation Criteria

Return Period (Years)	Climate Change	Simulation Outputs
100	20	No flooding permitted

2.5 Greenfield Run-Off

The One Year Greenfield Peak Run-Off rate was calculated as 1.8 l/s/ha. Therefore the larger value of 1.8 l/s/ha was used in accordance with Meath County Council requirements. As the northern road and tower compound site is circa 0.69ha and the southern main platform site is 4.07ha in size, this corresponds to a run-off rate of 1.24 and 7.33 l/s respectively.

2.6 Simulation Results

The drainage modelling has analysed the 1 in 100 return period (with an allowance of 20% made for climate change) and no flooding occurs.

2.7 Drainage Modelling Assumptions

Assumptions made in the modelling of the drainage design are noted below:

- The invert levels of the ditch which the surface water will discharge to have been assumed as 32.500 mAOD at the northern outfall and 31.700mAOD at the southern outfall
- A minimum diameter of 75mm for orifice plates and hydro brakes.
- Discharge rate from the site restricted to 1.8/l/s/ha.
- Rainfall intensity of 50mm/hr.
- Pipe roughness *k* value of 0.6mm.
- PIMP (Percentage Impervious)
    - Roads and concrete hardstanding areas = 100%
    - Gravelled and unbound surfaced areas = 95%
    - Grassed areas = 30%
- A void percentage of 30% has been assumed in the modelling of the infiltration through the gravel and type 1 surfaced areas.
- The proposed infiltration systems are all >1m above the groundwater levels as recorded by the in-situ standpipe testing undertaken in March and April 2019 by Irish Drilling Ltd. The results of these tests are included within Appendix B of the report and discussed further in Section 3.4 of the report.

3. Supplementary Information

3.1 Flow Control Device

A hydrobrake vortex control will be utilised for each of the sub-catchment areas to limit the outfall discharge rates to the existing watercourse via drainage ditch to 1.24 l/s and 7.33l/s respectively, in line with greenfield run-off rates.

The technical specification and details of the flow control manhole are contained within Appendix C of the report.

3.2 Full Retention Separators

The proposed full retention separators will be 2 No. Klargester NSFA080 type and 4 No. Klargester NSFA050 type (or equal approved).

A single tanker cell is known to store an oil volume of up to 700 litres. Separators in fuelling areas will therefore be sized to contain the full contents of the tanker cell should it rupture, resulting in an oil spill. The gradients of the pavements in the fuelling areas will fall towards an ACO channel drain, which will then be directed into the separator.

The separators will be installed with an automatic closure device which will prevent flow passing through the separator when the quantity of oil in the separator exceeds the oil storage volume. The separator will also feature an automatic warning device to provide a visual and audible warning (if necessary) when the level of oil reaches 90 per cent of the oil storage volume under static liquid level conditions.

Should an oil spillage occur from the proposed fuel oil tank, the same principle outlined above with respect to the automatic closure will apply. Additional storage will be provided within the confines of the tank bunding walls.

The technical specification and associated drawings for the proposed full retention separators are contained within Appendix D of the report.

3.3 Soil Infiltration

The BRE 365 infiltration test results are contained within Appendix E of the report.

The results indicate that infiltration is not possible through the existing soil across the site; this has been considered in the drainage model.

3.4 Groundwater Levels

A short summary of the site investigation results (in relation to the groundwater levels) undertaken by Irish Drilling Ltd is provided below:

- Generally the trial pits were recorded as being dry with the exception of TP's 6,7 and 13 where water ingress was noted at 1.1m, 1.4m and 2.5m bgl.
- During the drilling of the cable percussion boreholes, groundwater was noted occasionally within the casing at depths ranging between 6 to 9.5m bgl during the drilling.
- 50mm slotted standpipes with response zones extending between 1.5 and 16.0m bgl were installed in 5 boreholes on completion of the rotary drilling (BH's 02, 06, 08, 09 and 10).
- There are inconsistencies within the reporting of the water observations on the draft engineering logs (specifically CP logs for BH04 & 09 and Rotary log for BH09). Copies of the checked final engineering logs should be supplied by the GI Contractor.
- Subsequent monitoring has been undertaken over 3 visits over a 7 week period.
- Groundwater levels in BH's 06, 08, 09 and 10 were recorded at depths ranging between 9.98 and 14.98m bgl with one occurrence where the standpipe was dry (16m bgl).
- Groundwater levels in BH02 were consistently higher, ranging between 2.43 and 3.5m bgl.

groundwater readings in BH02 as they are all in close proximity and are likely to be as a result of a localised perched water table with a more granular zone of the glacial till.

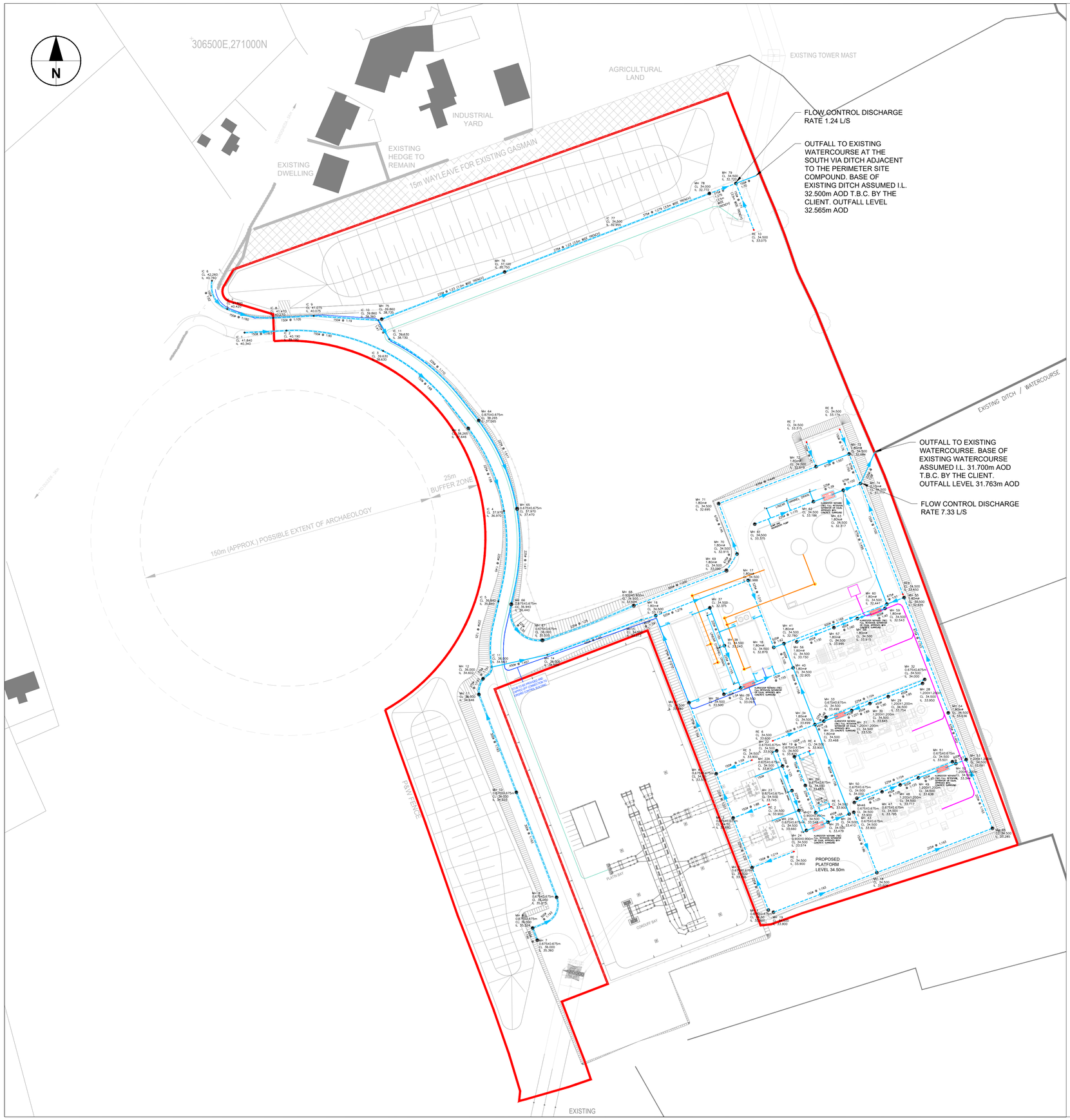
3.5 Conclusion

In Conclusion, by providing this Engineering report AECOM and SSE have demonstrated detailed Q-bar calculations for greenfield run off from the sites. Discharge rates to the respective outfall locations are restricted to the aforementioned greenfield run-off rates.

BRE 365 results for the site have been provided with details of the groundwater table levels in line with item 3.3. AECOM have considered the soil permeability is low across the site and this is reflected in the drainage proposals. Infiltration systems have been maximised where possible across the site. Where infiltrated systems are used these are all in excess of 1m above the recorded water table levels in line with Appendix E.

AECOM have demonstrated the above design meets the Planning requirements set out by Meath County Council.

Appendix A – Proposed Drainage Layout



NOTES

1. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE. ALL LEVELS ARE IN METRES AND RELATE TO ORDNANCE DATUM.
2. DO NOT SCALE FROM ANY DRAWING. WORK TO FIGURED DIMENSIONS ONLY. ANY DISCREPANCIES IN DIMENSION ARE TO BE REFERRED TO THE DESIGNER BEFORE WORK IS PUT TO HAND.
3. PROPOSED DRAINAGE INDICATED ON THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND MAY BE SUBJECT TO CHANGE AT DETAILED DESIGN STAGE.
4. ALL SOLID PIPES WITH LESS THAN 0.6m UNDER CONCRETE SLAB, 1.5m UNDER HARDCORE AND 1.2m under soft COVER TO HAVE 150mm MIN CONCRETE SURROUND IN LINE WITH SEWER FOR SCOTLAND VOLUME 4.0.
5. MANHOLE CHAMBERS TO BE SIZED AS FOLLOWS;

LARGEST PIPE IN MANHOLE(mm)	INTERNAL MANHOLE DIAMETER (mm) * .
DIAMETER LESS THAN 375	1200
375-450	1350
450-700	1500

MANHOLES WITH A LARGE NUMBER OF BORES WILL REQUIRE UPSIZING.

6. DRAWING TO BE READ IN CONJUNCTION WITH AECOM DRAINAGE ENGINEERING REPORT.
7. ORIFICE ON THE FOLLOW CHAMBERS AS BELOW:
   - IC 3: 0.075m
   - IC 9: 0.075m
   - MH 5: 0.225m
   - MH 6: 0.180m
   - MH 11: 0.225m
   - MH 13: 0.375m
   - MH 18: 0.450m
   - MH 27: 0.450m
   - MH 60: 0.600m
   - MH 65: 0.180m
   - MH 72: 0.580m
   - MH 74: 0.075m

AECOM

Project

170MW OCGT POWER PLANT

Client

SSE GENERATION IRELAND LTD

LEGEND

- PROPOSED P.C. MANHOLES OR IN-SITU MANHOLES
- PROPOSED 450Ø ID INSPECTION CHAMBER
- PROPOSED SURFACE WATER PIPE, PERORATED PIPE WITH 3.0m WIDE TRENCH UNLESS STATED OTHERWISE
- PROPOSED SURFACE WATER PIPE, CARRIER PIPE
- PROPOSED RODDING EYE
- PROPOSED FILTER TRENCH (0.8m WIDE UNLESS STATED OTHERWISE)
- FULL RETENTION SEPARATOR. KLARGESTER OR EQUAL APPROVED

NOTES

APPROVED FOR ISSUE

B	EL	BG	CC
A	EL	BG	CC
I/R	DRAWN BY	CHECKED	APPROVED

ISSUE/REVISION

B	05/07/2023	FOR INFORMATON
A	31/05/2023	FOR INFORMATION
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60695232

SHEET TITLE

PROPOSED SURFACE WATER DRAINAGE LAYOUT

SHEET NUMBER

60695232-PLT-DR-020 REV B

Appendix B – Standpipe Water Level Readings

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274 Fax: (091) 880861

Project: SSE Platin - Project Echo
Client: SSE
Location: County Meath
Date: 23/04/2019 Sheet No. 1
Checked: RK

Water Levels in Standpipes

	Date						
Boreholes	**08/03/2019**		**14.03.2019**		**23/04/2019**		**Remarks**
BH 02	2.68m		2.43m		3.50m		50mm standpipe
BH 06	11.65m		14.00m		14.98m		50mm standpipe
BH 08	14.30m		DRY		14.50m		50mm standpipe
BH 09	9.98m		10.38m		12.70m		50mm standpipe
BH 10	10.10m		13.45m		14.32m		50mm standpipe

Remarks:
All readings record depth from ground level to top of water level.

Appendix C – Hydrobrake Details

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	2.700	5.800
Flush-Flo™	0.399	4.197
Kick-Flo®	0.823	3.341
Mean Flow		4.367

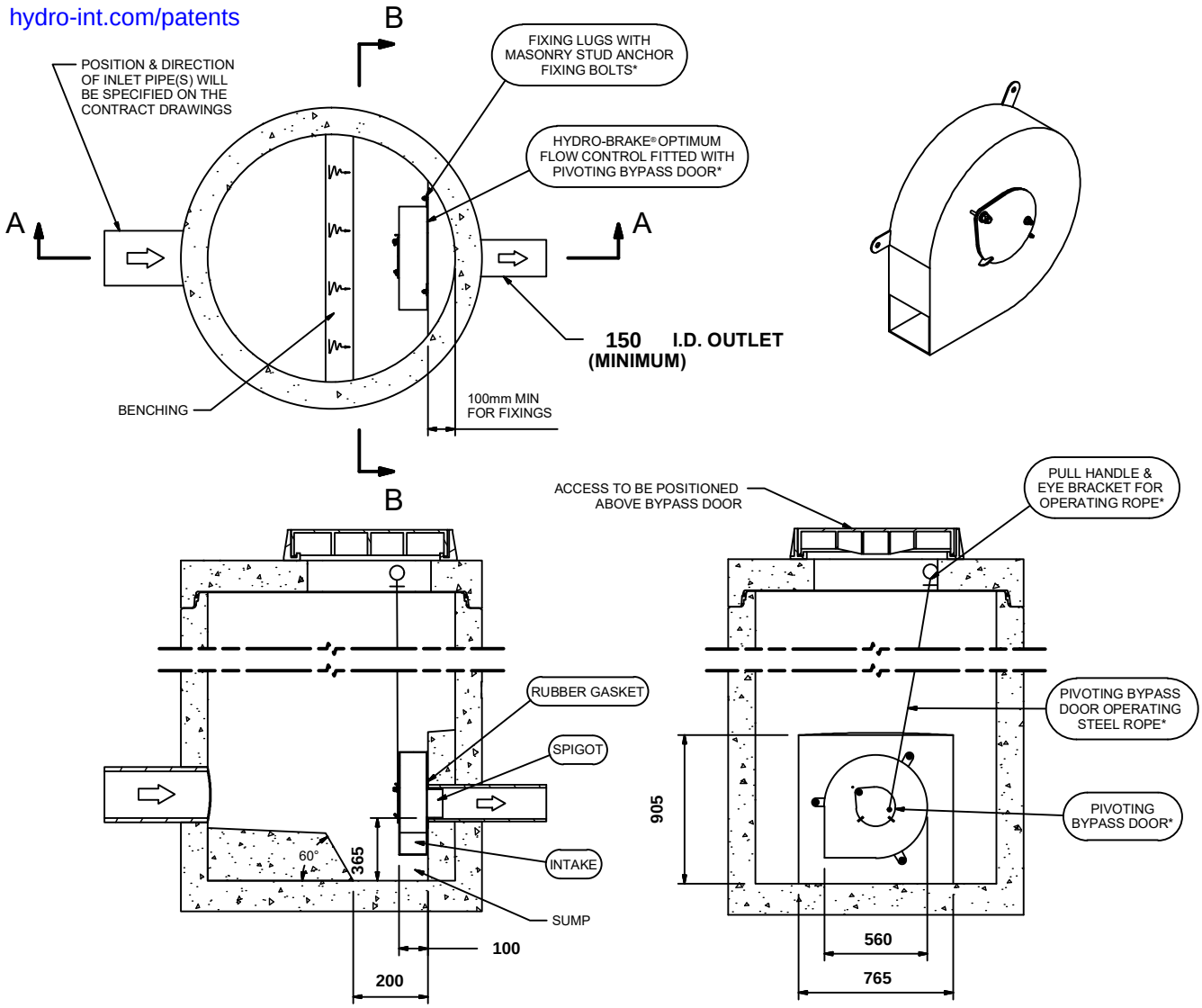
Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE 08/4596

WRc Approved PT/329/0412

hydro-int.com/patents



SECTION A-A

SECTION B-B

IMPORTANT: ⬭ LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

The head/flow characteristics of this SHE-0092-5800-2700-5800 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International®

DATE	6/18/2020 7:06 PM
SITE	208MW OCGT POWER PLANT
DESIGNER	Graham McEwan
REF	60630349

SHE-0092-5800-2700-5800
Hydro-Brake® Optimum

graham.mcewan@aecom.com

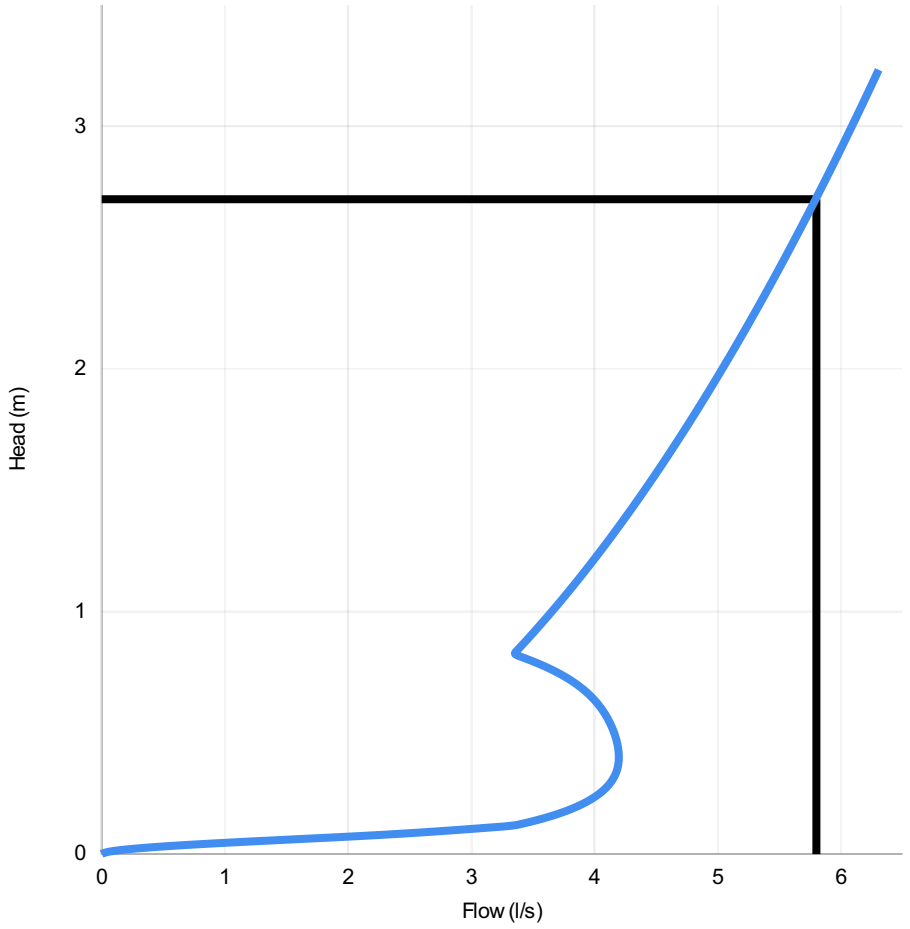
Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	2.700	5.800
Flush-Flo	0.399	4.197
Kick-Flo®	0.823	3.341
Mean Flow		4.367

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE No 08/4596

WRc APPROVED
PT/329/0412

hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.093	2.705
0.186	3.812
0.279	4.104
0.372	4.193
0.466	4.179
0.559	4.106
0.652	3.968
0.745	3.712
0.838	3.368
0.931	3.535
1.024	3.693
1.117	3.844
1.210	3.989
1.303	4.128
1.397	4.262
1.490	4.391
1.583	4.516
1.676	4.638
1.769	4.756
1.862	4.871
1.955	4.983
2.048	5.092
2.141	5.199
2.234	5.303
2.328	5.405
2.421	5.505
2.514	5.603
2.607	5.699
2.700	5.794

DESIGN ADVICE

The head/flow characteristics of this SHE-0092-5800-2700-5800 Hydro-Brake Optimum® Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

Hydro International®

DATE	18/06/2020 19:06
Site	208MW OCGT POWER PLANT
DESIGNER	Graham McEwan
Ref	60630349

SHE-0092-5800-2700-5800

Hydro-Brake Optimum®

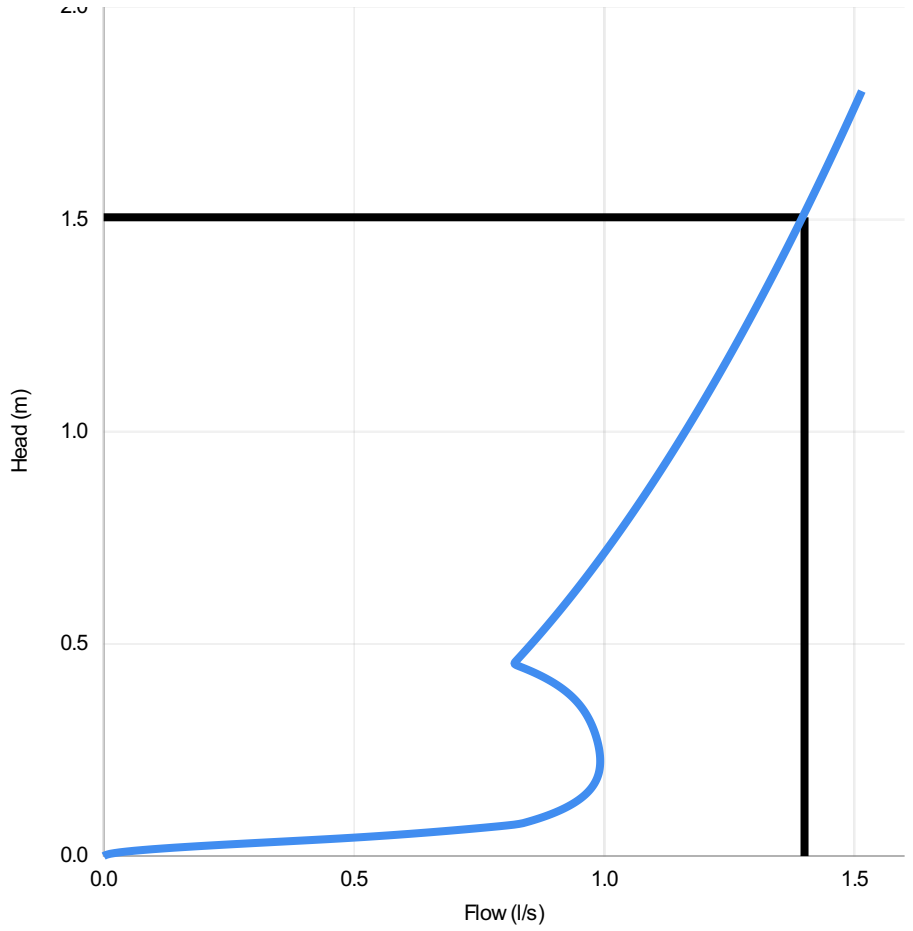
Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.505	1.400
Flush-Flo	0.224	0.992
Kick-Flo®	0.452	0.818
Mean Flow		1.053

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE No 08/4596

WRc APPROVED
PT/329/0412

hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.052	0.605
0.104	0.904
0.156	0.971
0.208	0.991
0.259	0.988
0.311	0.974
0.363	0.946
0.415	0.889
0.467	0.829
0.519	0.869
0.571	0.906
0.623	0.941
0.675	0.975
0.727	1.008
0.778	1.039
0.830	1.069
0.882	1.098
0.934	1.127
0.986	1.154
1.038	1.181
1.090	1.207
1.142	1.233
1.194	1.257
1.246	1.282
1.297	1.305
1.349	1.329
1.401	1.351
1.453	1.374
1.505	1.396

DESIGN ADVICE

The head/flow characteristics of this SHE-0050-1400-1505-1400 Hydro-Brake Optimum® Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

Hydro International®

DATE	18/06/2020 19:10
Site	208MW OCGT POWER PLANT
DESIGNER	Graham McEwan
Ref	60630349

SHE-0050-1400-1505-1400

Hydro-Brake Optimum®

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.505	1.400
Flush-Flo™	0.224	0.992
Kick-Flo®	0.452	0.818
Mean Flow		1.053

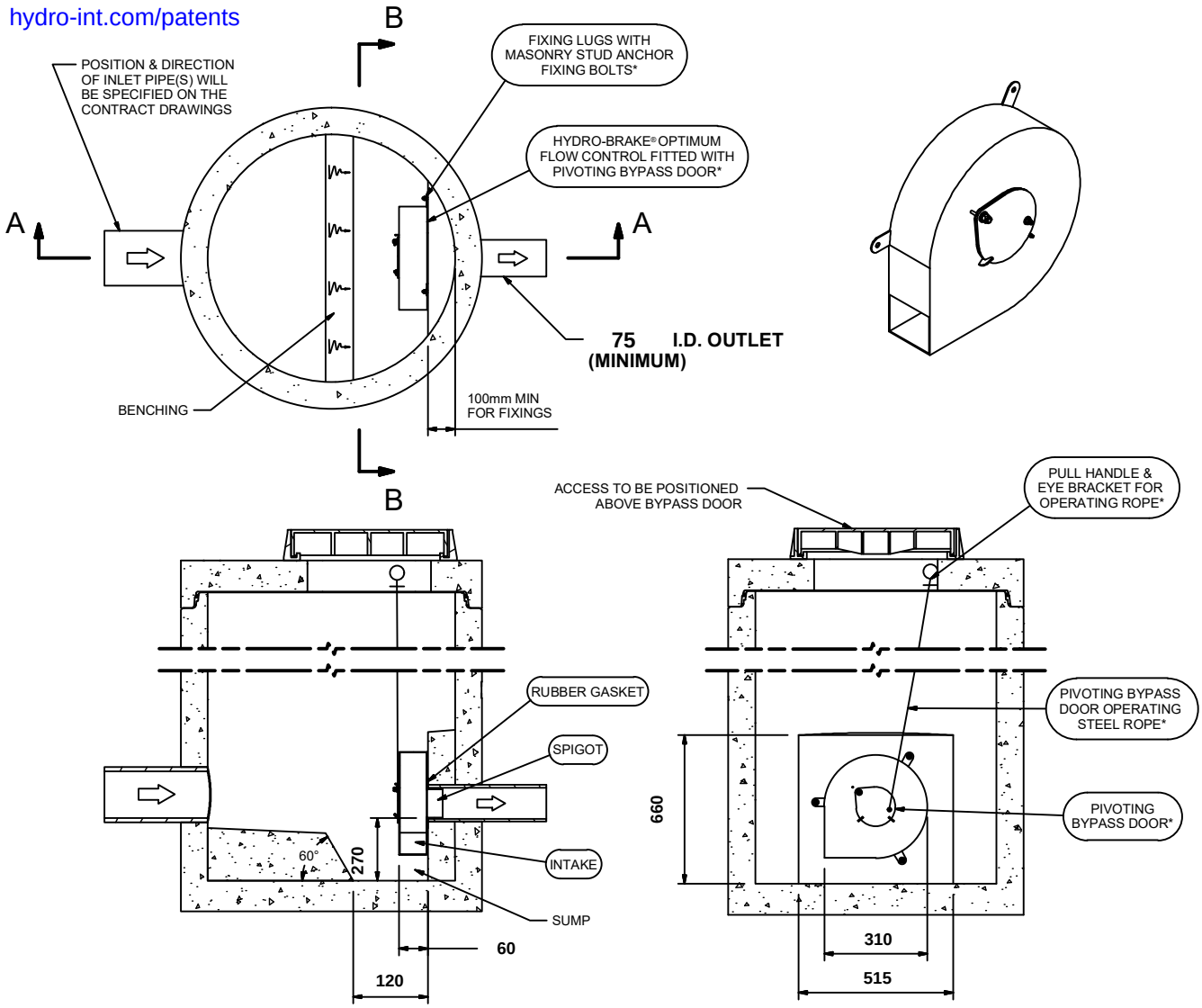
Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE 08/4596

WRc Approved PT/329/0412

hydro-int.com/patents



SECTION A-A

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HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

The head/flow characteristics of this SHE-0050-1400-1505-1400 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International®

DATE	6/18/2020 7:10 PM
SITE	208MW OCGT POWER PLANT
DESIGNER	Graham McEwan
REF	60630349

SHE-0050-1400-1505-1400
Hydro-Brake® Optimum

graham.mcewan@aecom.com

Appendix D – Full Retention Separator Specification and Drawings

Full Retention NSF RANGE

APPLICATION

Full retention separators are used in high risk spillage areas such as:

- Fuel distribution depots.
- Vehicle workshops.
- Scrap Yards

PERFORMANCE

Kingspan Klargester were the first UK manufacturer to have the required range (3-30 l/sec) certified to EN 858-1 in the UK. The NSF number denotes the flow at which the separator operates.

The British Standards Institute (BSI) have witnessed the performance tests of the required range of separators and have certified their performance, in relation to their flow and process performance to ensure that they met the effluent quality requirements of EN 858-1. Larger separator designs have been determined using the formulas extrapolated from the test range.

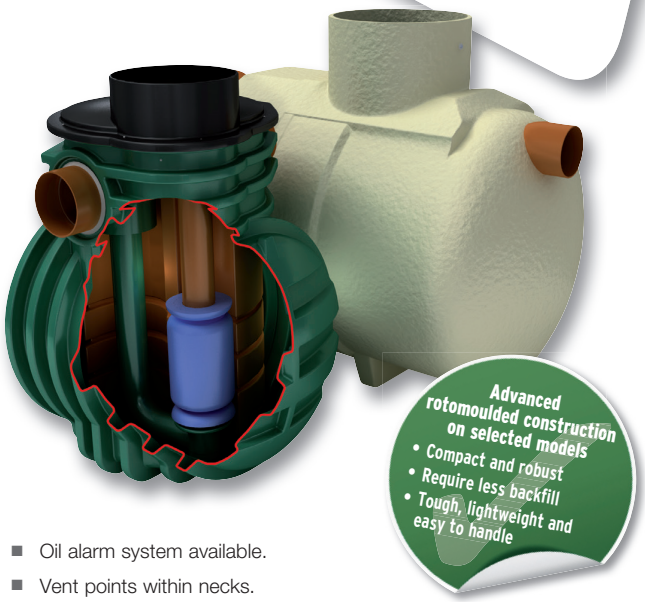
Each full retention separator design includes the necessary volume requirements for:

- Oil separation capacity.
- Silt storage capacity.
- Automatic closure device.
- Oil storage volume.
- Coalescer (Class I units only).

Klargester full retention separators treat the whole of the specified flow.

FEATURES

- Light and easy to install.
- Class I and Class II designs.
- 3-30 l/sec range independently tested and performance sampled, certified by the BSI.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.



- Oil alarm system available.
- Vent points within necks.
- Extension access shafts for deep inverts.
- Maintenance from ground level.
- GRP or rotomoulded construction (subject to model).

To specify a nominal size full retention separator, the following information is needed:-

- The calculated flow rate for the drainage area served. Our designs are based on the assumption that any interconnecting pipework fitted elsewhere on site does not impede flow into or out of the separator and that the influent is not pumped.
- The required discharge standard. This will decide whether a Class I or Class II unit is required.
- The drain invert inlet depth.
- Pipework type, size and orientation.

SIZES AND SPECIFICATIONS

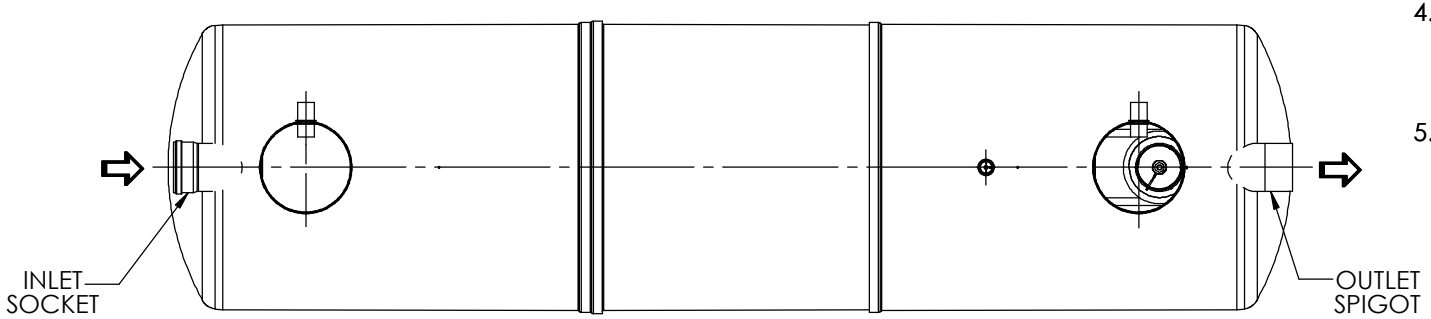
UNIT NOMINAL SIZE	FLOW (l/s)	DRAINAGE AREA (m^2) PPG-3 (0.018)	STORAGE CAPACITY (litres)		UNIT LENGTH (mm)	UNIT DIA. (mm)	BASE TO INLET INVERT (mm)	BASE TO OUTLET INVERT	MIN. INLET INLET (mm)	STANDARD PIPEWORK DIA. (mm)
			SILT	OIL						
NSFP003	3	170	300	30	1700	1350	1420	1345	500	160
NSFP006	6	335	600	60	1700	1350	1420	1345	500	160
NSFA010	10	555	1000	100	2610	1225	1050	1000	500	200
NSFA015	15	835	1500	150	3910	1225	1050	1000	500	200
NSFA020	20	1115	2000	200	3200	2010	1810	1760	1000	315
NSFA030	30	1670	3000	300	3915	2010	1810	1760	1000	315
NSFA040	40	2225	4000	400	4640	2010	1810	1760	1000	315
NSFA050	50	2780	5000	500	5425	2010	1810	1760	1000	315
NSFA065	65	3610	6500	650	6850	2010	1810	1760	1000	315
NSFA080	80	4445	8000	800	5744	2820	2500	2450	1000	300
NSFA100	100	5560	10000	1000	6200	2820	2500	2450	1000	400
NSFA125	125	6945	12500	1250	7365	2820	2500	2450	1000	450
NSFA150	150	8335	15000	1500	8675	2820	2550	2450	1000	525
NSFA175	175	9725	17500	1750	9975	2820	2550	2450	1000	525
NSFA200	200	11110	20000	2000	11280	2820	2550	2450	1000	600

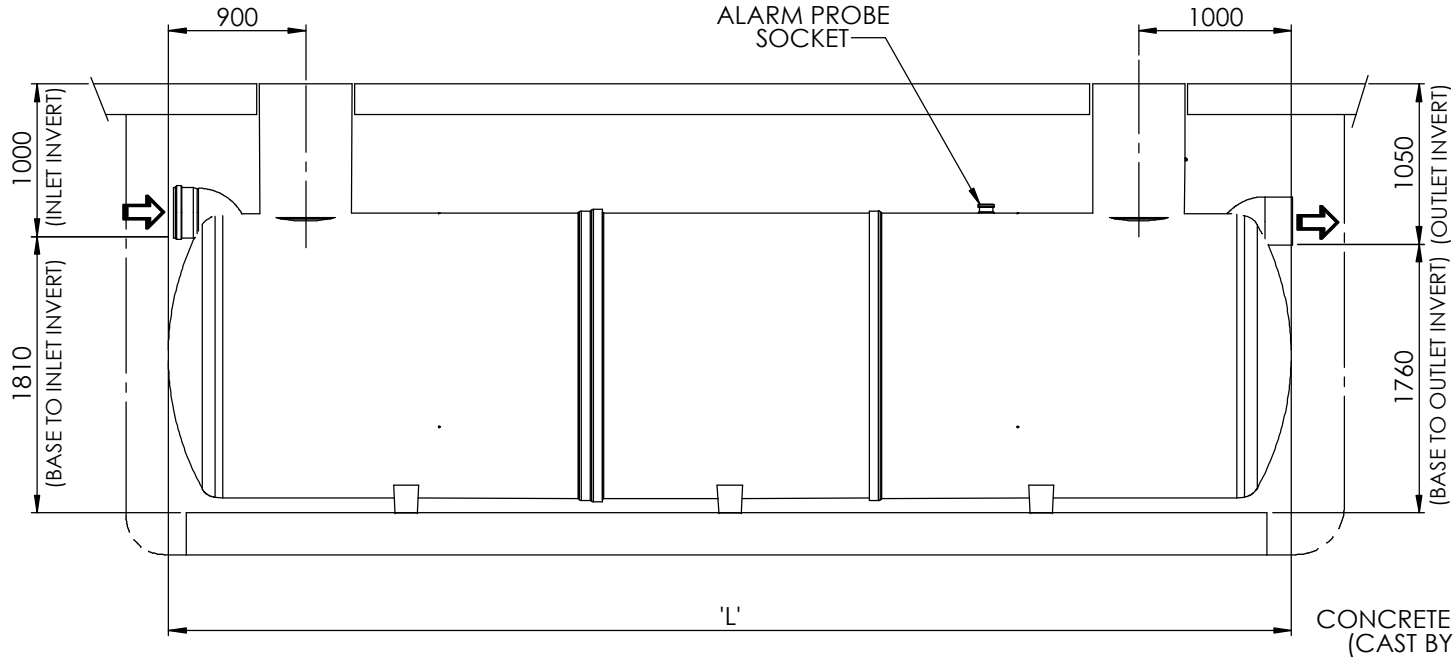
Rotomoulded chamber construction GRP chamber construction

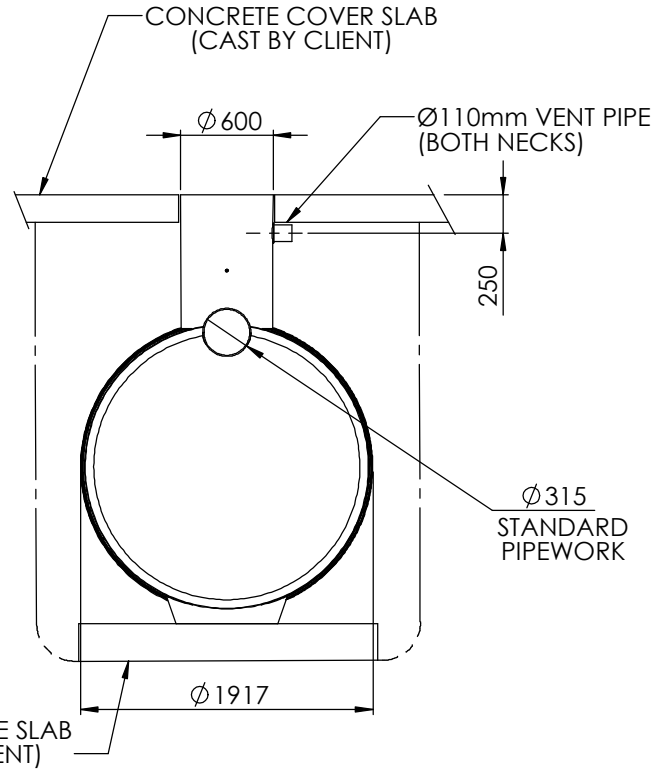
UNIT REF.	NOMINAL FLOW RATE (L/s)	APPROX. EMPTY WEIGHT (kg)	OVERALL LENGTH 'L'
NSFA020	20	575	3230
NSFA030	30	665	3960
NSFA040	40	740	4750
NSFA050	50	985	5790
NSFA065	65	1145	7360

NOTES:-

1. INLET/OUTLET PIPES ARE PLAIN PIPE Ø315mm PVCu. THE STANDARD EN858 STATES MINIMUM CONNECTION SIZES, UNITS ORDERED WITH DIFFERENT SIZED CONNECTIONS ARE NOT FULLY COMPLIANT WITH THE STANDARD.
2. EXTENSION NECKS FOR DEEPER INVERTS CAN BE PROVIDED IN 0.5m INCREMENTS, FOR ON SITE ASSEMBLY. MAXIMUM 2.0m INVERT RECOMMENDED.
3. ALL UNITS REQUIRE APPROPRIATE COVER AND FRAME TO SUIT APPLIED LOADINGS.
4. THIS DRAWING SHOULD BE USED FOR DIMENSIONAL INFORMATION ONLY. IT IS ESSENTIAL THAT THIS DRAWING IS READ IN CONJUNCTION WITH INSTALLATION GUIDELINES SUPPLIED WITH UNIT. (COPIES ARE AVAILABLE FROM OUR SALES DEPARTMENT).
5. THIS DRAWING IS ALSO AVAILABLE ON OUR WEBSITE www.kingspanenv.com







Issue	Date	Drawn by	Description
04	03.04.18	T.Kelly	CC1425 - Class 2 Reference Deleted
03	29.10.14	T.Kelly	CC1151 - Cases Changed
02	29.01.09	JC	Update Border

Material : Various	Tolerance : ± 5mm
Finish : n/a	Thickness : n/a
Weight : n/a	Surface Area : n/a

Drawing : DS0911P Page 1 of 1

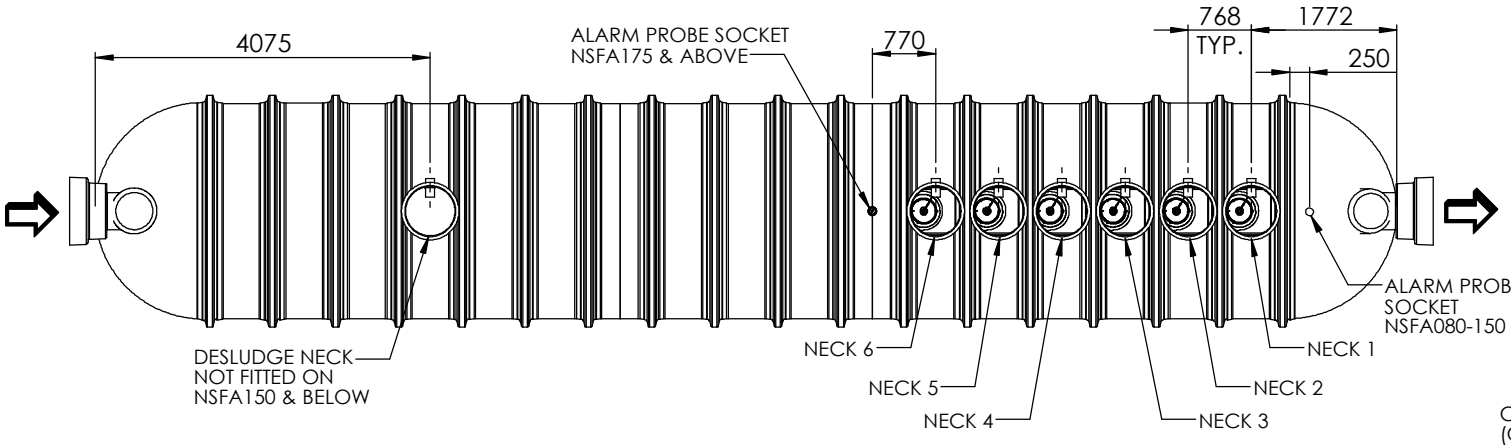
NSFA020 - NSFA065 Full Retention Separators

All dimensions in mm

Scale: Not to scale

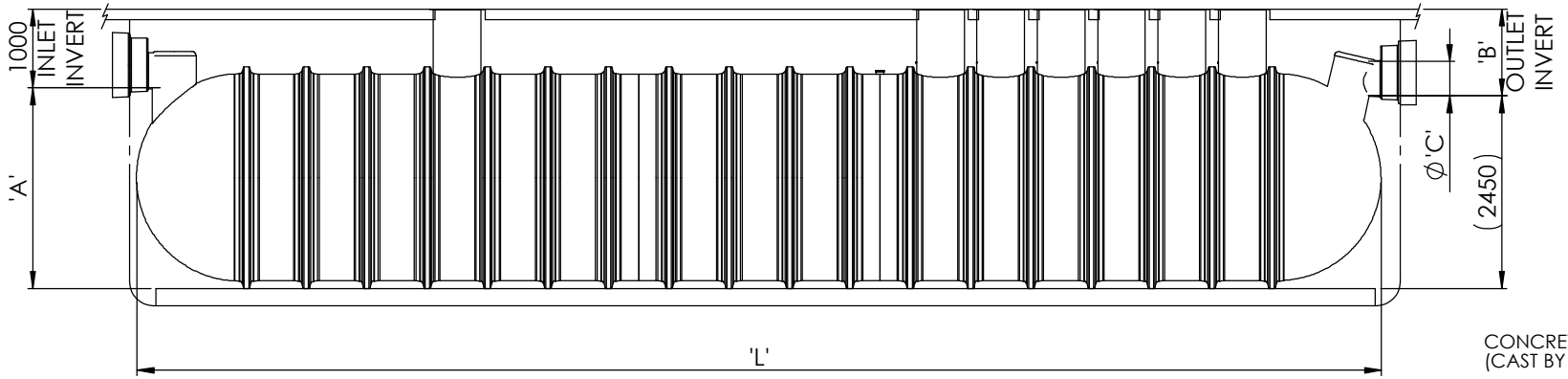
R:\Drawing Data\02 - Sales Drawings\DS\DS - 09\DS0911P NSFA020 - 065 Full Retention Separators

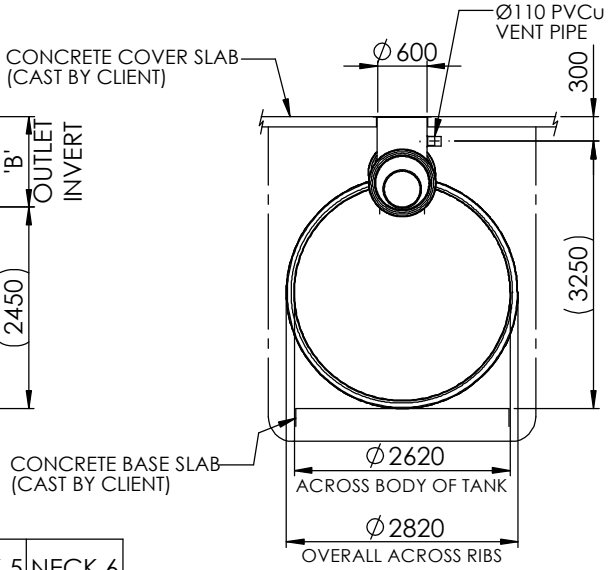
Kingspan Environmental



NOTES

1. BS EN 858 STATES MINIMUM CONNECTION SIZES, UNITS ORDERED WITH DIFFERENT SIZE CONNECTIONS ARE NOT FULLY COMPLIANT WITH THE STANDARD. ALTERNATIVE CONNECTORS MAY BE ORDERED.
2. EXTENSION NECKS FOR DEEPER INVERTS CAN BE PROVIDED IN 0.5m INCREMENTS FOR ON SITE ASSEMBLY. MAX 2.0m INVERT RECOMMENDED.
3. ALL UNITS REQUIRE APPROPRIATE COVER & FRAME TO SUIT APPLIED LOADINGS.
4. THIS DRAWING SHOULD BE USED FOR DIMENSIONAL INFORMATION ONLY. IT IS ESSENTIAL THAT THIS DRAWING IS READ IN CONJUNCTION WITH INSTALLATION GUIDELINES SUPPLIED WITH THE UNIT (COPIES ARE AVAILABLE FROM OUR SALES DEPT.).
5. STANDARD PIPE ORIENTATION SHOWN. FOR OTHER AVAILABLE OPTIONS SEE TDS0033.
6. THIS DRAWING IS ALSO AVAILABLE ON OUR WEBSITE www.kingspanenv.com





UNIT REF.	UNIT CLASS	NOMINAL FLOW RATE (L/s)	APPROX. EMPTY WEIGHT (kg)	'L' OVERALL LENGTH	'A' BASE TO INLET INVERT	'B' OUTLET INVERT	'C' STD. PIPE DIA. (GRP)	NECK 1 FITTED	NECK 2 FITTED	NECK 3 FITTED	NECK 4 FITTED	NECK 5 FITTED	NECK 6 FITTED
NSFA080	1	80	1250	5744	2500	1050	300	✓	✓				
NSFA100	1	100	1350	6200	2500	1050	375/400	✓	✓				
NSFA125	1	125	1700	7365	2500	1050	450	✓	✓	✓			
NSFA150	1	150	2000	8675	2550	1100	500/525	✓	✓	✓			
NSFA175	1	175	2400	9975	2550	1100	500/525	✓	✓	✓	✓		
NSFA200	1	200	2700	11280	2550	1100	600	✓	✓	✓	✓		
NSFA210	1	210	2900	11994	2550	1100	600	✓	✓	✓	✓	✓	
NSFA225	1	225	3100	12766	2550	1100	600	✓	✓	✓	✓	✓	
NSFA240	1	240	3300	13582	2550	1100	600	✓	✓	✓	✓	✓	
NSFA255	1	255	3450	14300	2550	1100	600	✓	✓	✓	✓	✓	✓
NSFA270	1	270	3600	15071	2550	1100	600	✓	✓	✓	✓	✓	✓
NSFA285	1	285	3800	15833	2550	1100	600	✓	✓	✓	✓	✓	✓

Please check with Kingspan Environmental For The Latest Issue Of This Drawing

Issue	Date	Drawn by	Description
04	11.03.19	T.Kelly	CC1444 - Units now built to 1.0m Invert First Fix
03	03.04.18	T.Kelly	CC1425 - Units 210 to 285 Added : Class 2 Reference Deleted

Material : n/a	Tolerance : n/a
Finish : n/a	Thickness : n/a
Weight : n/a	Surface Area : n/a

Drawing : DS0896P

NSFA080 - NSFA285 Full Retention Separators

All dimensions in mm

Scale: Not to scale

Kingspan Environmental

R:\Drawing Data\02 - Sales Drawings\DS\DS - 08\DS0896P NSFA080-285 Full Retention Separators

011259

NSFA020 – NSFA065 Full Retention Separators Installation & Maintenance Guidelines

Kingspan Environmental Service Contact Numbers:

GB: 0844 846 0500

NI: 028 3025 4077

IRL: 048 3025 4077

Enclosed Documents

DS0911P	**NSFA020 – NSFA065 Full Retention Separators Sales Drawing**
DS0859P	**Neck & Coalescer Extension Details**
PD0323	**Oil Probe Fitting Details**

Issue	Description	Date
04	CC1425 – Class 2 References Deleted	April 2018

HEALTH & SAFETY

These warnings are provided in the interest of safety. You must read them carefully before installing or using the equipment.
It is important that this document is retained with the equipment for future reference. Should the equipment be transferred to a new owner, always ensure that all relevant documents are supplied in order that the new owner can be acquainted with the functioning of the equipment and the relevant warnings.

Installation should only be carried out by a suitably experienced contractor, following these guidelines.

We recommend the use of a dust mask and gloves when cutting GRP components.

Electrical work should be carried out by a qualified electrician.

Contaminated surface water can contain substances harmful to human health. Any person carrying out maintenance on the equipment should wear suitable protective clothing, including gloves. Good hygiene practice should also be observed.

Access covers should be selected with reference to the location of the unit and traffic loads to be accommodated. These are not (normally) part of the Separator supply.

When covers are removed precautions must be taken against personnel falling into the unit.

Should you wish to inspect the operation of the equipment, please observe all necessary precautions, including those listed below, which apply to maintenance procedures.

Ensure that you are familiar with the safe working areas and accesses. Ensure that the working area is adequately lit.

Take care to maintain correct posture, particularly when lifting. Use appropriate lifting equipment when necessary. Keep proper footing and balance at all times. Avoid any sharp edges.

OIL ALARM SYSTEMS

PPG3 recommends that that the oil level alarm be fitted, tested and commissioned by a competent Installer. This is to ensure that the oil probe is calibrated correctly, raising an alarm when 90% of the oil storage volume is reached. Should the oil level alarm fail to provide an early warning, excessive oil could pass through the separator, thus polluting the environment. This could result in substantial cleanup costs and legal action being taken under the water resources act 1991.

MAINTENANCE

The correct ongoing maintenance is essential for the proper operation of the equipment. Operators who rely on oil level alarms to prompt them to service separators between maintenance intervals run the risk of polluting, should the alarms not work, hence the ongoing functional assessment of the oil alarm systems is fundamental if pollution incidents are to be avoided.

The removal of sediment and retained oil/grease should be carried out by a contractor holding the relevant permits to transport and dispose of such waste. The contractor must refer to the guidelines in this document.

CE

Kingspan Environmental
College Road North
Aston Clinton
Aylesbury
Buckinghamshire
HP22 5EW

10

EN 858 : Separator systems for light liquids

GRP Glass Reinforced Plastic Tank

Full Retention Separators NS003 - NS200

Class 1 & 2

Watertightness	Passed
Structural Testing	Passed
Hydraulic efficency	Passed

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Appendices

Separator Maintenance Log

1.0 Introduction

These Guidelines represent Best Practice for the installation of the above Full Retention Separator Units. Many years of specialist experience has led to the successful installation of thousands of separator units. It must be noted, however, that these Guidelines are necessarily of a general nature. It is the responsibility of others to verify that they are appropriate for the specific ground conditions and in-service loads of each installation. Similarly, a qualified specialist (e.g. Civil engineering consultant) must verify any information or advice given by employees or agents of the company regarding the design of an installation.

For guidance of Separator selection and application, please refer to the most recent issue of Environment Agency Guidelines No.3 (PPG3) and BS EN 858. Our Units have been independently tested by BSI and are certified as meeting the standards.

2.0 Handling & Storage

2.1. Care must be taken to ensure that units are not damaged during delivery and handling on site. Please take care and place unit so that it can not fall and become damaged.

2.2. The design requirements of our products will frequently mean that the centre of gravity of the unit is “offset”. Care must therefore be taken to ensure that the unit is stable when lifting. Rainwater may also collect inside units, particularly if they have been stored on site prior to installation, adding weight and increasing instability. Check units before lifting and pump out any excess water.

2.3. When lifting units, use webbing slings of a suitable specification. Do not use chains.

2.4. A suitable spreader bar should be used to ensure that units are stable and that loads are evenly distributed during lifting. When lifting separators, a spreader bar should be used where the slings would otherwise be at an angle > 30 degrees to the vertical.

2.5. Lifting equipment should be selected by taking into account the unit weight, length and the distance of lift required on site.

2.6. We accept no responsibility for the selection of lifting equipment.

2.7. Whenever our units are stored or moved on site, ensure that the storage location is free of rock, debris and any sharp objects, which may damage the unit. The units must be placed on ground, which is flat and level to evenly support the base of the unit. Do not roll separators.

3.0 Site Planning

The following points should be considered before installation of the equipment:

3.1. The discharge must have the consent of the relevant Environmental Regulator.

3.2. The installation should have Planning and Building Control approval.

3.3. Consider installing flow cut-off valves to isolate the separator in an emergency or during site cleaning operations. See Environment Agency Guidelines PPG3.

3.4. We will fit a tube to receive the alarm probe. This tube provides protection and ensures that the probe is positioned at the correct level to sense the oil build up. The tube design and probe level setting assumes the use of our standard oil alarm system and may not be suitable for other alarm supplier’s equipment. The probe tube may be fitted either within the neck or within the body of the unit. It should be extended to ground level when fitted in the body of the tank and you should make provision to extend the tube to the required height before backfilling. Consult the alarm supplier’s instructions for their detailed fitting installation instructions.

3.5. Consider venting of the unit. Comply with local regulations. In the UK, comply with the following regulations, for Petrol Stations: Health and Safety Guidance Note 41 (HS(G)41), for other applications: BS8301: 1985 (obsolescent) BS EN 752 Building Drainage. Adequate ventilation should be provided to the separator. The ventilation pipe should be as short as is practicable and be terminated not less than 2.5m above paving nor less than 1m above the head of an openable window or other opening into a building within a horizontal distance of 3m. Each neck should be vented independently, we advise against joining these below ground prior to their rising as vent stacks.

3.6. Uncontaminated run off such as roof water should be excluded from separators. (EA Guidelines PPG3.)

3.7. Consider installation of a sampling point downstream of the separator as there is no suitable facility to effectively sample the waste water from inside the unit. (Suggested in EN 858 Pt 1).

3.8. Ground conditions and water table level should be assessed. If the water table will be above the base of the units at any time of the year, adequate concrete backfill must be provided to avoid flotation. In poorly draining ground, consideration should also be given to the likelihood of flotation due to surface water collecting in the backfill, and an appropriate installation method devised to avoid this.

3.9. If the discharge is to a soakaway, a porosity test should be carried out as part of the assessment of suitability for sub-soil drainage.

3.10. The separator must be installed at a level that will allow connection to the incoming drain and a free discharge at the system outlet.

3.11. Do not install the unit deeper than necessary, if required, ensure that you purchase extension necks and coalescer extension chains. The minimum invert depth of the unit is shown on the customer drawing.

3.12. Adequate access must be provided for routine maintenance. Vehicles should not be permitted within a distance equal to the depth of the unit, unless suitable structural protection is provided to the installation.

3.13. There must be at least 1 metre of clear, level ground all around the access covers to allow for routine maintenance.

3.14. It is essential that a mains water supply is accessible for routine cleansing and refilling after removal of waste material and liquid.

3.15. Provide electrical supply for alarm system.

3.16. Installation should only be carried out by suitably qualified and experienced contractors in accordance with current Health and Safety Regulations. Electrical work should be carried out by a qualified electrician, working to the latest edition of IEE wiring regulations.

3.17. This unit is designed to operate with gravity in and out flows. The unit is not designed to operate with a pumped influent.

4.0 Installation – General

4.1. When units are installed in unstable ground conditions where movement of the surrounding material and/or unit may occur, the connecting pipework should be designed to minimise the risk of damage from differential movement of the unit(s) and/or surrounding material.

4.2. For separators with burial depths greater than 1000mm from cover level to the top of the unit, specific site conditions should be taken into consideration and the backfill designed to bear any loads which may be applied during and after installation to prevent the tank being subjected to these loads.

4.3. The excavation must be deep enough to provide bedding and cover depth as determined by the type of surface pavement and loading. Asphalt and concrete pads should extend a minimum of 300mm horizontally beyond the unit in all directions.

4.4. In situations where the excavation will not maintain a vertical wall, it will be necessary to shore up the side walls of the excavation with suitable trench sheets and bracing systems to maintain a vertical wall from the bottom to the top of the excavation. DO NOT completely remove the shoring system until the backfilling is complete, but before the concrete fully hardens.

4.5. In areas where the water table is above the bottom of the excavation and/or the excavation is liable to flood, the excavation should be dewatered using suitable pumping equipment and this should continue until the installation is complete.

4.6. During installation care must be taken to ensure that the body of any unit is uniformly supported so that point loads through the unit are avoided.

4.7. The Concrete Specification is not a site specific installation design.

GENERAL CONCRETE SPECIFICATION IN ACCORDANCE WITH BS EN 206-1 (BS 8500-1)		
TYPE OF MIX		(DC) DESIGN
PERMITTED TYPE OF CEMENT		BS 12 (OPC): BS 12 (RHPC): BS 4027 (SRPC)
PERMITTED TYPE OF AGGREGATE (coarse & fine)		BS 882
NOMINAL MAXIMUM SIZE OF AGGREGATE		20 mm
GRADES: C25 /30 C25 /30 C16 /20		REINFORCED & ABOVE GROUND WITH HOLDING DOWN BOLTS REINFORCED (EG. FOR HIGH WATER TABLE) UNREINFORCED (NORMAL CONDITIONS)
MINIMUM CEMENT CONTENT	C30 C20	270 - 280 Kg/M^3 220 - 230 Kg/M^3
SLUMP CLASS		S1 (25mm)
RATE OF SAMPLING		READY MIX CONCRETE SHOULD BE SUPPLIED COMPLETE WITH APPROPRIATE DELIVERY TICKET IN ACCORDANCE WITH BS EN 12350-1
NOTE: STANDARD MIXES SHOULD NOT BE USED WHERE SULPHATES OR OTHER AGGRESSIVE CHEMICALS EXIST IN GROUND WATER		

5.0 Separator Installation

5.1. Excavate a hole of sufficient length and width to accommodate the tank and a minimum 300mm concrete surround and to a depth that allows for the burial depth of the unit plus concrete base slab.

5.2. Construct a suitable concrete base slab appropriate to site conditions. Ensure that the slab is flat and level.

5.3. When the concrete base slab has set enough to support the installed load, add a concrete haunch so as to provide even support under the unit, and then lower the unit onto the haunch using suitable webbing slings and lifting equipment.

5.4. Locate the float valve in the coalescer unit(s). Lift float valve and secure in the open position before filling and release when full. If the valve is not lifted during filling, it may ”seat”. The valve is fitted with cord to aid lifting. Add cord if extending the invert and fasten end to a convenient point.

5.5. Pour no more than 300mm depth of clean water into the unit, avoiding shock loads. For units with more than one chamber, add water to each chamber simultaneously. DO NOT OVERFILL, the unit is not designed to hold water whilst unsupported. FILL THROUGH OUTLET AS WELL AS INLET.

5.6. Place concrete backfill to approximately 300mm depth under and to the sides of the tank ensuring good compaction to remove voids. DO NOT use vibrating pokers. Continue adding concrete backfill, simultaneously keeping the internal water level no more than 200mm above the backfill level at all times, until the backfill is just below the underside of the outlet drain, giving sufficient room to connect the inlet and outlet pipework.

5.7. Connect inlet and outlet drains and vent pipes when safe access to the backfill can be gained.

PIPEWORK CONNECTIONS

In all cases, ensure that the outlet pipework level is maintained for correct operation. (Unless specified on the order, the fall across the unit will be as per the customer drawings). Small units are generally fitted with **PVCu spigots** to both the outlet and the inlet. Connect using the same size PVCu socket or a suitable reducer. Larger units are generally fitted with our own **GRP** manufactured sockets. The connecting pipework should be pushed into the socket and a joint made to fill in the gap using rope/hemp with a cement mortar or bonding mix. Ensure that the seal is secure and watertight before backfilling the pipe. Alternatively, proprietary **flex seal couplings** can be obtained to fit over the outside of the site pipework and the outside of the GRP socket. When using this connection method, please be aware that the outside GRP laminate is not perfectly regular and that you may need to use a sealant on the outside diameter of the GRP. Take care not to over tighten the coupling when connecting to the GRP and ensure that the seal is secure before backfilling the pipe. Drawing DS0185 provides the ID of our GRP sockets. The OD is variable, as the wall thickness can be up to 15-20 mm. If purchasing a flex seal coupling for use with clay/concrete, we suggest that a size 110 mm larger than the ID is selected.

5.8. Oil Level Alarm Neck fitting

We will fit a tube to receive the oil alarm probe. This provides protection and ensures that the probe is positioned at the correct level to sense oil build up. See alarm supplier information and ensure that the probe is placed within the tube and can be accessed from ground level.

Continue backfilling with concrete over the tank body to the required level. Build up a shell of concrete, minimum 225mm thick, around the access shaft(s). Temporarily strut the access shaft to avoid distortion.

5.9. Where we supply an extension shaft to meet a deeper invert requirement, a coalescer extension chain is also provided when needed. Remove the coalescer from the unit before adding the extension shaft(s). It is advisable to seal the joints on the extension shafts (particularly on sites with high ground water) with proprietary sealant or by GRP lamination (if skilled operatives are available). Temporarily strut the extension neck(s) to avoid distortion during back filling. Where more than one neck section is required to suit a deep invert, consider back-filling section by section. If the extension neck is too long, it can be trimmed using a fine-toothed saw. The original fixing hole bolting the coalescer to the neck should be sealed. Ensure that the vent socket if cut out, is replaced elsewhere. The maximum recommended inlet invert is 2000mm (using 500mm long extension sections). If you are installing a unit deeper than this then you must make your own arrangements for removing and replacing the coalescer. Consideration must be given to the depth of lift involved.

5.10. If extending the neck, remember to add a suitable length of cord to enable the float valve to be lifted when the unit is emptied. If the valve is not raised during filling then the float valve may stick at the base.

5.11. Coalescer. When refitting, ensure that the core tube is correctly seated onto the base fitting.

5.12. Continue back-filling, ensuring minimum 225mm concrete thickness around the access shaft/ extension neck and alarm access tube (as applicable).

5.13. Mains powered alarm Systems. See alarm suppliers installation instructions. Lay 82mm diameter PVCu underground ducting between the alarm panel location and the alarm probe position. The ducting should be 500mm below ground level and fitted with a drawstring for later cable insertion. Any changes of direction should be by long radius bend. If necessary, drill a suitable hole in the access shaft adjacent to the alarm probe terminal box, to accept the ducting and seal.

5.14. In traffic areas a suitable top slab must be constructed. The top slab should bear on a suitable foundation to prevent superimposed loads being transmitted to the unit and access shafts. Loads applied to covers and frames must bear on the top slab, not the access shaft.

5.15. The unit should be filled with clean water up to the invert level of the outlet pipe. Ensure the unit identification is placed/marked inside the neck for future information. The unit is now ready for use.

6.0 Alarm Installation

6.1 Install the alarm probe and control panel, as per the Suppliers Alarm Installation Guidelines. Ensure that the probe is positioned correctly for the required storage of oil. The table below indicates the volume of oil stored and the depth of floating oil expected in the separation chamber.

Unit	Recommended Maximum Oil Storage volume	Max. Depth of floating oil (100 %) (Static)
NSFA020	200 litres	53mm
NSFA030	300 litres	60mm
NSFA040	400 litres	65mm
NSFA050	500 litres	70mm
NSFA065	650 litres	67mm

7.0 Operation

7.1 The unit is sized on treating a defined area and rainfall (50 mm/hour) EN 858 Part 1, and using the factor provided in the EA guidelines PPG 3. The entire flow up to the units listed flow rating is fully treated.

7.2 Units include a core tube with replaceable media. Separated Liquid enters the core tube after passing through the media, to the outlet. The coalescer media requires maintenance and replacement at intervals. See section 8.

7.3 Units are provided with a closure device, incorporating a float. As the level of oil builds up and forms a floating layer, so the float/closure device moves downward to prevent oily water being passed through the unit. The unit **MUST** be emptied after the closure device has operated. The coalescer media should be inspected and changed if fouled.

7.4 An oil probe should be positioned to detect the accumulation of oil when there is no or low flow conditions. It is a requirement to position the probe so that the alarm operates at 90% of the maximum recommended oil storage volume. **When the alarm operates, the oil should be removed. Accumulated silt should also be removed.**

7.5 These Separators are not effective for the removal of soluble or emulsified pollutants such as oil/detergent mixes found in vehicle wash effluents. With permission, such discharges may be drained to the foul sewer. See Environment Agency Guidelines PPG3. Or contact our Technical Sales Department for suitable alternative equipment.

8.0 Maintenance

Separated light liquid **must** be removed from the separator when the oil capacity has been reached.

8.1. An oil level alarm system is available which gives warning when the separated light liquid/water interface level reaches 90% of the maximum recommended oil storage volume.

8.2. Separators should be inspected at least every six months or more frequently if experience dictates. A log should be maintained detailing the depth of oil found, any volume removed and any silt removal or cleaning carried out. A specimen maintenance log is included in the appendices.

8.3. Every site is different, in respect to the amount and type of silt generated by the drain design and installation. Frequently, the site construction programme itself generates large and perhaps unusual quantities of silt and grit. We recommend that following the initial installation, an inspection of the separator contents be made to check that building rubble has not entered the unit. Further inspections at 3 and 6 months should be made so as to be able to assess the volumes of silt and oil accumulated. An inspection and emptying programme can then be defined following the first 6 months site experience. We recommend a maximum inspection interval of 6 months.

8.4. Coalescer media is a replaceable item and is available as a spare.

8.5. Alarm probes should be removed and cleaned with water whenever waste material is removed from the separator. Please note the alarm may alert until the liquid level is replaced. Consult the alarm supplier's literature.

8.6. If the unit is emptied, the float/closure device should be raised and then lowered after the unit has been refilled. (Do not lower it into an empty unit as the closure device will self seat)

8.7. **Separator waste is a "special waste" under the terms of The Waste Management Code of Practice. The Code imposes a duty of care on the waste producer to ensure that the Cleansing contractor is registered with the Environment Agency and that the final disposal of the waste is to a licensed facility.**

8.8. You should consider the purchase of a maintenance service, from a competent installer, which includes bi-annual inspections, removal of oil and silt, cleaning of the alarm probe and cleaning or replacement of the coalescer media (where appropriate).

Waste Removal Procedure – Oil & Silt

Oil should only be removed when there is no flow entering the unit. Isolate the unit and prevent flow from entering. Always remove the oil before attempting to remove the coalescer. If this is not done, when the coalescer is withdrawn, any excess oil may coat the media surface and when replaced could contaminate the effluent.

8.9. Remove the access cover and lower the desludging hose into the separation chamber. Draw off the surface oil.

8.10. When removing the silt, lower the desludging hose to the base of the tank and withdraw any grit or sludge that may be present. It is not necessary to remove all the liquid unless you need to ensure the unit has been fully emptied. Ensure that you access and clean all compartments.

8.11. Remove the alarm probe, clean with water and replace. Ensure that it is working correctly

8.12. Consider the period of time that the coalescer has been installed and consider removing and inspecting (cleaning or replacing) the coalescer media. If removed, ensure that it is correctly replaced. It is best to lower the liquid level when refitting. Replace the access covers.

8.13. Re-fill the separator with clean water up to the outlet level. The alarm may display an alarm condition until the separator is re-filled. Check alarm operation when unit full.

8.14. Check the float/closure device and raise, if it has self-seated.

Checking the Coalescer Assembly

8.15. Coalescers should be checked and cleaned regularly, also following a major incident replaced if necessary. It may be possible to squeeze/rinse out silt contamination from the media, but it is impossible to remove oil. Please contact Kingspan if you wish to purchase replacement coalescer foam media. Identify the type and size of separator (shown on labels inside the access neck).

8.16. Assemblies weighing less than 25 Kg may be removed by hand. Heavier assemblies should be lifted by mechanical means. Any lifting device employed must be capable of lifting:

- In excess of the maximum assembly weight.
- The assembly completely out of the access shaft.
- Giving a smooth and controlled lift.
- Swinging the assembly to one side clear of the access shaft.

Unit	Dry Weight (Kg) Core tube & media	Wet Weight (Kg Core tube & media	Silted Weight (Kg) Core tube & media	Replacement media part no.
NSFA020	27 kg	40 kg	≈ 55 kg	402733
NSFA030	27 kg	40 kg	≈ 55 kg	402733
NSFA040	27 kg	40 kg	≈ 55 kg	402733
NSFA050	27 kg	40 kg	≈ 55 kg	402733
NSFA065	27 kg	40 kg	≈ 55 kg	402733

8.17. Ensure that the area around the access shaft is clear and that there is space to place the coalescer core tube assembly once removed. If space is not available it will be necessary to support the assembly over the access shaft e.g. by scaffold poles and platform.

8.18. Only remove the access cover when necessary to remove the assembly. Do not leave the access shaft uncovered and unattended.

8.19. It is recommended that core tubes be lifted by mechanical means, especially if it is suspected that the coalescer media be silted.

8.20. Removing the coalescer assembly.

8.21. A cut out is provided in the top of the coalescer tube to aid lifting. When the unit is installed the coalescer tube is bolted to the neck for transport. Deeper invert units are provided with a coalescer tube extension chain of the appropriate length.

8.22. Lift the assembly with a smooth and steady motion. Core tubes and media will become lighter as water drains from the exposed media. Allow the water to drain completely. Assemblies blocked with fine silt may be very heavy.

8.23. Fully extract the assembly and set it down adjacent to the access shaft. Consider cleaning or replacement of the media.

8.24. Cleaning the coalescer assembly /Media Replacement.

8.25. Hose down the assembly using clean water at normal pressure. (You may be able to return the cleaning water into the separator, if there is sufficient separator capacity.) Do not allow untreated cleaning water to pass out of the unit. Continue hosing media until the water runs clear. If the media is heavily contaminated with oil and silt it may not be possible to clean effectively by hosing and should be replaced.

8.26. When replacing the media, undo the banding. Slide media off the core tube and slide new media on. Ensure all the apertures on the core tube are covered by the media. Re-secure or replace banding. Consider replacing media every two years.

8.27. Replacing the coalescer assembly.

8.28. Position coalescer assembly over the access shaft and remove any safety coverings.

8.29. Lower the assembly steadily into the access shaft, orientate core tube correctly and locate over sump cone. Check the float/closure device is free to operate.

9.0 Emergencies

9.1. At sites where there is a high risk of spillage, spill kits containing drain seals, absorbent materials, disposal containers and other appropriate equipment should be held. In the event of a spillage on site, the material should be contained, (if a spill kit is not available, sand or soil may be used) and the Environment Agency notified immediately using the appropriate emergency hotline number listed in the Agency Guideline PPG3. Year 2012 – 0800 80 70 60

SEPARATOR MAINTENANCE LOG

Site address/location .....

.....

Separator location .....

.....

Type of separator .....

Nominal Flow .....

Total capacity .....

Inspection/ Maintenance Date	Comments	Waste Volumes Removed (if appropriate)

011259

NSFA020 – NSFA065 Full Retention Separators Installation & Maintenance Guidelines

Kingspan Environmental Service Contact Numbers:

GB: 0844 846 0500

NI: 028 3025 4077

IRL: 048 3025 4077

Enclosed Documents

DS0911P	**NSFA020 – NSFA065 Full Retention Separators Sales Drawing**
DS0859P	**Neck & Coalescer Extension Details**
PD0323	**Oil Probe Fitting Details**

Issue	Description	Date
04	CC1425 – Class 2 References Deleted	April 2018

HEALTH & SAFETY

These warnings are provided in the interest of safety. You must read them carefully before installing or using the equipment.
It is important that this document is retained with the equipment for future reference. Should the equipment be transferred to a new owner, always ensure that all relevant documents are supplied in order that the new owner can be acquainted with the functioning of the equipment and the relevant warnings.

Installation should only be carried out by a suitably experienced contractor, following these guidelines.

We recommend the use of a dust mask and gloves when cutting GRP components.

Electrical work should be carried out by a qualified electrician.

Contaminated surface water can contain substances harmful to human health. Any person carrying out maintenance on the equipment should wear suitable protective clothing, including gloves. Good hygiene practice should also be observed.

Access covers should be selected with reference to the location of the unit and traffic loads to be accommodated. These are not (normally) part of the Separator supply.

When covers are removed precautions must be taken against personnel falling into the unit.

Should you wish to inspect the operation of the equipment, please observe all necessary precautions, including those listed below, which apply to maintenance procedures.

Ensure that you are familiar with the safe working areas and accesses. Ensure that the working area is adequately lit.

Take care to maintain correct posture, particularly when lifting. Use appropriate lifting equipment when necessary. Keep proper footing and balance at all times. Avoid any sharp edges.

OIL ALARM SYSTEMS

PPG3 recommends that that the oil level alarm be fitted, tested and commissioned by a competent Installer. This is to ensure that the oil probe is calibrated correctly, raising an alarm when 90% of the oil storage volume is reached. Should the oil level alarm fail to provide an early warning, excessive oil could pass through the separator, thus polluting the environment. This could result in substantial cleanup costs and legal action being taken under the water resources act 1991.

MAINTENANCE

The correct ongoing maintenance is essential for the proper operation of the equipment. Operators who rely on oil level alarms to prompt them to service separators between maintenance intervals run the risk of polluting, should the alarms not work, hence the ongoing functional assessment of the oil alarm systems is fundamental if pollution incidents are to be avoided.

The removal of sediment and retained oil/grease should be carried out by a contractor holding the relevant permits to transport and dispose of such waste. The contractor must refer to the guidelines in this document.

CE

Kingspan Environmental
College Road North
Aston Clinton
Aylesbury
Buckinghamshire
HP22 5EW

10

EN 858 : Separator systems for light liquids

GRP Glass Reinforced Plastic Tank

Full Retention Separators NS003 - NS200

Class 1 & 2

Watertightness	Passed
Structural Testing	Passed
Hydraulic efficency	Passed

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Appendices

Separator Maintenance Log

1.0 Introduction

These Guidelines represent Best Practice for the installation of the above Full Retention Separator Units. Many years of specialist experience has led to the successful installation of thousands of separator units. It must be noted, however, that these Guidelines are necessarily of a general nature. It is the responsibility of others to verify that they are appropriate for the specific ground conditions and in-service loads of each installation. Similarly, a qualified specialist (e.g. Civil engineering consultant) must verify any information or advice given by employees or agents of the company regarding the design of an installation.

For guidance of Separator selection and application, please refer to the most recent issue of Environment Agency Guidelines No.3 (PPG3) and BS EN 858. Our Units have been independently tested by BSI and are certified as meeting the standards.

2.0 Handling & Storage

2.1. Care must be taken to ensure that units are not damaged during delivery and handling on site. Please take care and place unit so that it can not fall and become damaged.

2.2. The design requirements of our products will frequently mean that the centre of gravity of the unit is “offset”. Care must therefore be taken to ensure that the unit is stable when lifting. Rainwater may also collect inside units, particularly if they have been stored on site prior to installation, adding weight and increasing instability. Check units before lifting and pump out any excess water.

2.3. When lifting units, use webbing slings of a suitable specification. Do not use chains.

2.4. A suitable spreader bar should be used to ensure that units are stable and that loads are evenly distributed during lifting. When lifting separators, a spreader bar should be used where the slings would otherwise be at an angle > 30 degrees to the vertical.

2.5. Lifting equipment should be selected by taking into account the unit weight, length and the distance of lift required on site.

2.6. We accept no responsibility for the selection of lifting equipment.

2.7. Whenever our units are stored or moved on site, ensure that the storage location is free of rock, debris and any sharp objects, which may damage the unit. The units must be placed on ground, which is flat and level to evenly support the base of the unit. Do not roll separators.

3.0 Site Planning

The following points should be considered before installation of the equipment:

3.1. The discharge must have the consent of the relevant Environmental Regulator.

3.2. The installation should have Planning and Building Control approval.

3.3. Consider installing flow cut-off valves to isolate the separator in an emergency or during site cleaning operations. See Environment Agency Guidelines PPG3.

3.4. We will fit a tube to receive the alarm probe. This tube provides protection and ensures that the probe is positioned at the correct level to sense the oil build up. The tube design and probe level setting assumes the use of our standard oil alarm system and may not be suitable for other alarm supplier’s equipment. The probe tube may be fitted either within the neck or within the body of the unit. It should be extended to ground level when fitted in the body of the tank and you should make provision to extend the tube to the required height before backfilling. Consult the alarm supplier’s instructions for their detailed fitting installation instructions.

3.5. Consider venting of the unit. Comply with local regulations. In the UK, comply with the following regulations, for Petrol Stations: Health and Safety Guidance Note 41 (HS(G)41), for other applications: BS8301: 1985 (obsolescent) BS EN 752 Building Drainage. Adequate ventilation should be provided to the separator. The ventilation pipe should be as short as is practicable and be terminated not less than 2.5m above paving nor less than 1m above the head of an openable window or other opening into a building within a horizontal distance of 3m. Each neck should be vented independently, we advise against joining these below ground prior to their rising as vent stacks.

3.6. Uncontaminated run off such as roof water should be excluded from separators. (EA Guidelines PPG3.)

3.7. Consider installation of a sampling point downstream of the separator as there is no suitable facility to effectively sample the waste water from inside the unit. (Suggested in EN 858 Pt 1).

3.8. Ground conditions and water table level should be assessed. If the water table will be above the base of the units at any time of the year, adequate concrete backfill must be provided to avoid flotation. In poorly draining ground, consideration should also be given to the likelihood of flotation due to surface water collecting in the backfill, and an appropriate installation method devised to avoid this.

3.9. If the discharge is to a soakaway, a porosity test should be carried out as part of the assessment of suitability for sub-soil drainage.

3.10. The separator must be installed at a level that will allow connection to the incoming drain and a free discharge at the system outlet.

3.11. Do not install the unit deeper than necessary, if required, ensure that you purchase extension necks and coalescer extension chains. The minimum invert depth of the unit is shown on the customer drawing.

3.12. Adequate access must be provided for routine maintenance. Vehicles should not be permitted within a distance equal to the depth of the unit, unless suitable structural protection is provided to the installation.

3.13. There must be at least 1 metre of clear, level ground all around the access covers to allow for routine maintenance.

3.14. It is essential that a mains water supply is accessible for routine cleansing and refilling after removal of waste material and liquid.

3.15. Provide electrical supply for alarm system.

3.16. Installation should only be carried out by suitably qualified and experienced contractors in accordance with current Health and Safety Regulations. Electrical work should be carried out by a qualified electrician, working to the latest edition of IEE wiring regulations.

3.17. This unit is designed to operate with gravity in and out flows. The unit is not designed to operate with a pumped influent.

4.0 Installation – General

4.1. When units are installed in unstable ground conditions where movement of the surrounding material and/or unit may occur, the connecting pipework should be designed to minimise the risk of damage from differential movement of the unit(s) and/or surrounding material.

4.2. For separators with burial depths greater than 1000mm from cover level to the top of the unit, specific site conditions should be taken into consideration and the backfill designed to bear any loads which may be applied during and after installation to prevent the tank being subjected to these loads.

4.3. The excavation must be deep enough to provide bedding and cover depth as determined by the type of surface pavement and loading. Asphalt and concrete pads should extend a minimum of 300mm horizontally beyond the unit in all directions.

4.4. In situations where the excavation will not maintain a vertical wall, it will be necessary to shore up the side walls of the excavation with suitable trench sheets and bracing systems to maintain a vertical wall from the bottom to the top of the excavation. DO NOT completely remove the shoring system until the backfilling is complete, but before the concrete fully hardens.

4.5. In areas where the water table is above the bottom of the excavation and/or the excavation is liable to flood, the excavation should be dewatered using suitable pumping equipment and this should continue until the installation is complete.

4.6. During installation care must be taken to ensure that the body of any unit is uniformly supported so that point loads through the unit are avoided.

4.7. The Concrete Specification is not a site specific installation design.

GENERAL CONCRETE SPECIFICATION IN ACCORDANCE WITH BS EN 206-1 (BS 8500-1)		
TYPE OF MIX		(DC) DESIGN
PERMITTED TYPE OF CEMENT		BS 12 (OPC): BS 12 (RHPC): BS 4027 (SRPC)
PERMITTED TYPE OF AGGREGATE (coarse & fine)		BS 882
NOMINAL MAXIMUM SIZE OF AGGREGATE		20 mm
GRADES: C25 /30 C25 /30 C16 /20		REINFORCED & ABOVE GROUND WITH HOLDING DOWN BOLTS REINFORCED (EG. FOR HIGH WATER TABLE) UNREINFORCED (NORMAL CONDITIONS)
MINIMUM CEMENT CONTENT	C30 C20	270 - 280 Kg/M^3 220 - 230 Kg/M^3
SLUMP CLASS		S1 (25mm)
RATE OF SAMPLING		READY MIX CONCRETE SHOULD BE SUPPLIED COMPLETE WITH APPROPRIATE DELIVERY TICKET IN ACCORDANCE WITH BS EN 12350-1
NOTE: STANDARD MIXES SHOULD NOT BE USED WHERE SULPHATES OR OTHER AGGRESSIVE CHEMICALS EXIST IN GROUND WATER		

5.0 Separator Installation

5.1. Excavate a hole of sufficient length and width to accommodate the tank and a minimum 300mm concrete surround and to a depth that allows for the burial depth of the unit plus concrete base slab.

5.2. Construct a suitable concrete base slab appropriate to site conditions. Ensure that the slab is flat and level.

5.3. When the concrete base slab has set enough to support the installed load, add a concrete haunch so as to provide even support under the unit, and then lower the unit onto the haunch using suitable webbing slings and lifting equipment.

5.4. Locate the float valve in the coalescer unit(s). Lift float valve and secure in the open position before filling and release when full. If the valve is not lifted during filling, it may ”seat”. The valve is fitted with cord to aid lifting. Add cord if extending the invert and fasten end to a convenient point.

5.5. Pour no more than 300mm depth of clean water into the unit, avoiding shock loads. For units with more than one chamber, add water to each chamber simultaneously. DO NOT OVERFILL, the unit is not designed to hold water whilst unsupported. FILL THROUGH OUTLET AS WELL AS INLET.

5.6. Place concrete backfill to approximately 300mm depth under and to the sides of the tank ensuring good compaction to remove voids. DO NOT use vibrating pokers. Continue adding concrete backfill, simultaneously keeping the internal water level no more than 200mm above the backfill level at all times, until the backfill is just below the underside of the outlet drain, giving sufficient room to connect the inlet and outlet pipework.

5.7. Connect inlet and outlet drains and vent pipes when safe access to the backfill can be gained.

PIPEWORK CONNECTIONS

In all cases, ensure that the outlet pipework level is maintained for correct operation. (Unless specified on the order, the fall across the unit will be as per the customer drawings). Small units are generally fitted with **PVCu spigots** to both the outlet and the inlet. Connect using the same size PVCu socket or a suitable reducer. Larger units are generally fitted with our own **GRP** manufactured sockets. The connecting pipework should be pushed into the socket and a joint made to fill in the gap using rope/hemp with a cement mortar or bonding mix. Ensure that the seal is secure and watertight before backfilling the pipe. Alternatively, proprietary **flex seal couplings** can be obtained to fit over the outside of the site pipework and the outside of the GRP socket. When using this connection method, please be aware that the outside GRP laminate is not perfectly regular and that you may need to use a sealant on the outside diameter of the GRP. Take care not to over tighten the coupling when connecting to the GRP and ensure that the seal is secure before backfilling the pipe. Drawing DS0185 provides the ID of our GRP sockets. The OD is variable, as the wall thickness can be up to 15-20 mm. If purchasing a flex seal coupling for use with clay/concrete, we suggest that a size 110 mm larger than the ID is selected.

5.8. Oil Level Alarm Neck fitting

We will fit a tube to receive the oil alarm probe. This provides protection and ensures that the probe is positioned at the correct level to sense oil build up. See alarm supplier information and ensure that the probe is placed within the tube and can be accessed from ground level.

Continue backfilling with concrete over the tank body to the required level. Build up a shell of concrete, minimum 225mm thick, around the access shaft(s). Temporarily strut the access shaft to avoid distortion.

5.9. Where we supply an extension shaft to meet a deeper invert requirement, a coalescer extension chain is also provided when needed. Remove the coalescer from the unit before adding the extension shaft(s). It is advisable to seal the joints on the extension shafts (particularly on sites with high ground water) with proprietary sealant or by GRP lamination (if skilled operatives are available). Temporarily strut the extension neck(s) to avoid distortion during back filling. Where more than one neck section is required to suit a deep invert, consider back-filling section by section. If the extension neck is too long, it can be trimmed using a fine-toothed saw. The original fixing hole bolting the coalescer to the neck should be sealed. Ensure that the vent socket if cut out, is replaced elsewhere. The maximum recommended inlet invert is 2000mm (using 500mm long extension sections). If you are installing a unit deeper than this then you must make your own arrangements for removing and replacing the coalescer. Consideration must be given to the depth of lift involved.

5.10. If extending the neck, remember to add a suitable length of cord to enable the float valve to be lifted when the unit is emptied. If the valve is not raised during filling then the float valve may stick at the base.

5.11. Coalescer. When refitting, ensure that the core tube is correctly seated onto the base fitting.

5.12. Continue back-filling, ensuring minimum 225mm concrete thickness around the access shaft/ extension neck and alarm access tube (as applicable).

5.13. Mains powered alarm Systems. See alarm suppliers installation instructions. Lay 82mm diameter PVCu underground ducting between the alarm panel location and the alarm probe position. The ducting should be 500mm below ground level and fitted with a drawstring for later cable insertion. Any changes of direction should be by long radius bend. If necessary, drill a suitable hole in the access shaft adjacent to the alarm probe terminal box, to accept the ducting and seal.

5.14. In traffic areas a suitable top slab must be constructed. The top slab should bear on a suitable foundation to prevent superimposed loads being transmitted to the unit and access shafts. Loads applied to covers and frames must bear on the top slab, not the access shaft.

5.15. The unit should be filled with clean water up to the invert level of the outlet pipe. Ensure the unit identification is placed/marked inside the neck for future information. The unit is now ready for use.

6.0 Alarm Installation

6.1 Install the alarm probe and control panel, as per the Suppliers Alarm Installation Guidelines. Ensure that the probe is positioned correctly for the required storage of oil. The table below indicates the volume of oil stored and the depth of floating oil expected in the separation chamber.

Unit	Recommended Maximum Oil Storage volume	Max. Depth of floating oil (100 %) (Static)
NSFA020	200 litres	53mm
NSFA030	300 litres	60mm
NSFA040	400 litres	65mm
NSFA050	500 litres	70mm
NSFA065	650 litres	67mm

7.0 Operation

7.1 The unit is sized on treating a defined area and rainfall (50 mm/hour) EN 858 Part 1, and using the factor provided in the EA guidelines PPG 3. The entire flow up to the units listed flow rating is fully treated.

7.2 Units include a core tube with replaceable media. Separated Liquid enters the core tube after passing through the media, to the outlet. The coalescer media requires maintenance and replacement at intervals. See section 8.

7.3 Units are provided with a closure device, incorporating a float. As the level of oil builds up and forms a floating layer, so the float/closure device moves downward to prevent oily water being passed through the unit. The unit **MUST** be emptied after the closure device has operated. The coalescer media should be inspected and changed if fouled.

7.4 An oil probe should be positioned to detect the accumulation of oil when there is no or low flow conditions. It is a requirement to position the probe so that the alarm operates at 90% of the maximum recommended oil storage volume. **When the alarm operates, the oil should be removed. Accumulated silt should also be removed.**

7.5 These Separators are not effective for the removal of soluble or emulsified pollutants such as oil/detergent mixes found in vehicle wash effluents. With permission, such discharges may be drained to the foul sewer. See Environment Agency Guidelines PPG3. Or contact our Technical Sales Department for suitable alternative equipment.

8.0 Maintenance

Separated light liquid **must** be removed from the separator when the oil capacity has been reached.

8.1. An oil level alarm system is available which gives warning when the separated light liquid/water interface level reaches 90% of the maximum recommended oil storage volume.

8.2. Separators should be inspected at least every six months or more frequently if experience dictates. A log should be maintained detailing the depth of oil found, any volume removed and any silt removal or cleaning carried out. A specimen maintenance log is included in the appendices.

8.3. Every site is different, in respect to the amount and type of silt generated by the drain design and installation. Frequently, the site construction programme itself generates large and perhaps unusual quantities of silt and grit. We recommend that following the initial installation, an inspection of the separator contents be made to check that building rubble has not entered the unit. Further inspections at 3 and 6 months should be made so as to be able to assess the volumes of silt and oil accumulated. An inspection and emptying programme can then be defined following the first 6 months site experience. We recommend a maximum inspection interval of 6 months.

8.4. Coalescer media is a replaceable item and is available as a spare.

8.5. Alarm probes should be removed and cleaned with water whenever waste material is removed from the separator. Please note the alarm may alert until the liquid level is replaced. Consult the alarm supplier's literature.

8.6. If the unit is emptied, the float/closure device should be raised and then lowered after the unit has been refilled. (Do not lower it into an empty unit as the closure device will self seat)

8.7. **Separator waste is a "special waste" under the terms of The Waste Management Code of Practice. The Code imposes a duty of care on the waste producer to ensure that the Cleansing contractor is registered with the Environment Agency and that the final disposal of the waste is to a licensed facility.**

8.8. You should consider the purchase of a maintenance service, from a competent installer, which includes bi-annual inspections, removal of oil and silt, cleaning of the alarm probe and cleaning or replacement of the coalescer media (where appropriate).

Waste Removal Procedure – Oil & Silt

Oil should only be removed when there is no flow entering the unit. Isolate the unit and prevent flow from entering. Always remove the oil before attempting to remove the coalescer. If this is not done, when the coalescer is withdrawn, any excess oil may coat the media surface and when replaced could contaminate the effluent.

8.9. Remove the access cover and lower the desludging hose into the separation chamber. Draw off the surface oil.

8.10. When removing the silt, lower the desludging hose to the base of the tank and withdraw any grit or sludge that may be present. It is not necessary to remove all the liquid unless you need to ensure the unit has been fully emptied. Ensure that you access and clean all compartments.

8.11. Remove the alarm probe, clean with water and replace. Ensure that it is working correctly

8.12. Consider the period of time that the coalescer has been installed and consider removing and inspecting (cleaning or replacing) the coalescer media. If removed, ensure that it is correctly replaced. It is best to lower the liquid level when refitting. Replace the access covers.

8.13. Re-fill the separator with clean water up to the outlet level. The alarm may display an alarm condition until the separator is re-filled. Check alarm operation when unit full.

8.14. Check the float/closure device and raise, if it has self-seated.

Checking the Coalescer Assembly

8.15. Coalescers should be checked and cleaned regularly, also following a major incident replaced if necessary. It may be possible to squeeze/rinse out silt contamination from the media, but it is impossible to remove oil. Please contact Kingspan if you wish to purchase replacement coalescer foam media. Identify the type and size of separator (shown on labels inside the access neck).

8.16. Assemblies weighing less than 25 Kg may be removed by hand. Heavier assemblies should be lifted by mechanical means. Any lifting device employed must be capable of lifting:

- In excess of the maximum assembly weight.
- The assembly completely out of the access shaft.
- Giving a smooth and controlled lift.
- Swinging the assembly to one side clear of the access shaft.

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NSFA040	27 kg	40 kg	≈ 55 kg	402733
NSFA050	27 kg	40 kg	≈ 55 kg	402733
NSFA065	27 kg	40 kg	≈ 55 kg	402733

8.17. Ensure that the area around the access shaft is clear and that there is space to place the coalescer core tube assembly once removed. If space is not available it will be necessary to support the assembly over the access shaft e.g. by scaffold poles and platform.

8.18. Only remove the access cover when necessary to remove the assembly. Do not leave the access shaft uncovered and unattended.

8.19. It is recommended that core tubes be lifted by mechanical means, especially if it is suspected that the coalescer media be silted.

8.20. Removing the coalescer assembly.

8.21. A cut out is provided in the top of the coalescer tube to aid lifting. When the unit is installed the coalescer tube is bolted to the neck for transport. Deeper invert units are provided with a coalescer tube extension chain of the appropriate length.

8.22. Lift the assembly with a smooth and steady motion. Core tubes and media will become lighter as water drains from the exposed media. Allow the water to drain completely. Assemblies blocked with fine silt may be very heavy.

8.23. Fully extract the assembly and set it down adjacent to the access shaft. Consider cleaning or replacement of the media.

8.24. Cleaning the coalescer assembly /Media Replacement.

8.25. Hose down the assembly using clean water at normal pressure. (You may be able to return the cleaning water into the separator, if there is sufficient separator capacity.) Do not allow untreated cleaning water to pass out of the unit. Continue hosing media until the water runs clear. If the media is heavily contaminated with oil and silt it may not be possible to clean effectively by hosing and should be replaced.

8.26. When replacing the media, undo the banding. Slide media off the core tube and slide new media on. Ensure all the apertures on the core tube are covered by the media. Re-secure or replace banding. Consider replacing media every two years.

8.27. Replacing the coalescer assembly.

8.28. Position coalescer assembly over the access shaft and remove any safety coverings.

8.29. Lower the assembly steadily into the access shaft, orientate core tube correctly and locate over sump cone. Check the float/closure device is free to operate.

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9.1. At sites where there is a high risk of spillage, spill kits containing drain seals, absorbent materials, disposal containers and other appropriate equipment should be held. In the event of a spillage on site, the material should be contained, (if a spill kit is not available, sand or soil may be used) and the Environment Agency notified immediately using the appropriate emergency hotline number listed in the Agency Guideline PPG3. Year 2012 – 0800 80 70 60

SEPARATOR MAINTENANCE LOG

Site address/location .....

.....

Separator location .....

.....

Type of separator .....

Nominal Flow .....

Total capacity .....

Inspection/ Maintenance Date	Comments	Waste Volumes Removed (if appropriate)

015050
NSFA080 – NSFA285 Full Retention Separators Installation & Maintenance Guidelines

Contact Numbers:

UK:
Service Tel: +44 (0) 845 355 0555
Service Fax: +44 (0) 1264 325245

Ireland:
Service Tel: +44 (0) 28 302 54077
Service Fax: +44 (0) 28 302 60046

Enclosed Documents

DS0896P	**NSFA080 – NSFA285 Full Retention Separators Sales Drawing**
DS0859P	**Neck & Coalescer Extension Details NSFA Full Retention Separators**
PD0323	**Oil Probe Fitting Details**

Issue	Description	Date
04	CC1425 – Class 2 References Deleted	April 2018

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Installation should only be carried out by a suitably experienced contractor, following these guidelines.

We recommend the use of a dust mask and gloves when cutting GRP components.

Electrical work should be carried out by a qualified electrician.

Contaminated surface water can contain substances harmful to human health. Any person carrying out maintenance on the equipment should wear suitable protective clothing, including gloves. Good hygiene practice should also be observed.

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When covers are removed precautions must be taken against personnel falling into the unit.

Should you wish to inspect the operation of the equipment, please observe all necessary precautions, including those listed below, which apply to maintenance procedures.

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Take care to maintain correct posture, particularly when lifting. Use appropriate lifting equipment when necessary. Keep proper footing and balance at all times. Avoid any sharp edges.

OIL ALARM SYSTEMS

PPG3 recommends that that the oil level alarm be fitted, tested and commissioned by a competent Installer. This is to ensure that the oil probe is calibrated correctly, raising an alarm when 90% of the oil storage volume is reached. Should the oil level alarm fail to provide an early warning, excessive oil could pass through the separator, thus polluting the environment. This could result in substantial cleanup costs and legal action being taken under the water resources act 1991.

MAINTENANCE

The correct ongoing maintenance is essential for the proper operation of the equipment. Operators who rely on oil level alarms to prompt them to service separators between maintenance intervals run the risk of polluting, should the alarms not work, hence the ongoing functional assessment of the oil alarm systems is fundamental if pollution incidents are to be avoided.

The removal of sediment and retained oil/grease should be carried out by a contractor holding the relevant permits to transport and dispose of such waste. The contractor must refer to the guidelines in this document.

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Appendices

Separator Maintenance Log

CE

Kingspan Environmental
College Road North
Aston Clinton
Aylesbury
Buckinghamshire
HP22 5EW

10

EN 858 : Separator systems for light liquids

GRP Glass Reinforced Plastic Tank

Full Retention Separators NS003 - NS200

Class 1 & 2

Watertightness	Passed
Structural Testing	Passed
Hydraulic efficency	Passed

1.0 Introduction

These Guidelines represent Best Practice for the installation of the above Full Retention Separator Units. Many years of specialist experience has led to the successful installation of thousands of separator units. It must be noted, however, that these Guidelines are necessarily of a general nature. It is the responsibility of others to verify that they are appropriate for the specific ground conditions and in-service loads of each installation. Similarly, a qualified specialist (e.g. Civil engineering consultant) must verify any information or advice given by employees or agents of the company regarding the design of an installation.

For guidance of Separator selection and application, please refer to the most recent issue of Environment Agency Guidelines No.3 (PPG3) and BS EN 858. Our Units have been independently tested by BSI and are certified as meeting the standards.

2.0 Handling & Storage

2.1. Care must be taken to ensure that units are not damaged during delivery and handling on site. Please take care and place unit so that it can not fall and become damaged.

2.2. The design requirements of our products will frequently mean that the centre of gravity of the unit is “offset”. Care must therefore be taken to ensure that the unit is stable when lifting. Rainwater may also collect inside units, particularly if they have been stored on site prior to installation, adding weight and increasing instability. Check units before lifting and pump out any excess water.

2.3. When lifting units, use webbing slings of a suitable specification. Do not use chains.

2.4. A suitable spreader bar should be used to ensure that units are stable and that loads are evenly distributed during lifting. When lifting separators, a spreader bar should be used where the slings would otherwise be at an angle > 30 degrees to the vertical.

2.5. Lifting equipment should be selected by taking into account the unit weight, length and the distance of lift required on site.

2.6. We accept no responsibility for the selection of lifting equipment.

2.7. Whenever our units are stored or moved on site, ensure that the storage location is free of rock, debris and any sharp objects, which may damage the unit. The units must be placed on ground, which is flat and level to evenly support the base of the unit. Do not roll separators.

3.0 Site Planning

The following points should be considered before installation of the equipment:

3.1. The discharge must have the consent of the relevant Environmental Regulator.

3.2. The installation should have Planning and Building Control approval.

3.3. Consider installing flow cut-off valves to isolate the separator in an emergency or during site cleaning operations. See Environment Agency Guidelines PPG3.

3.4. We will fit a tube to receive the alarm probe. This tube provides protection and ensures that the probe is positioned at the correct level to sense the oil build up. The tube design and probe level setting assumes the use of our standard oil alarm system and may not be suitable for other alarm supplier’s equipment. The probe tube may be fitted either within the neck or within the body of the unit. It should be extended to ground level when fitted in the body of the tank and you should make provision to extend the tube to the required height before backfilling. Consult the alarm supplier’s instructions for their detailed fitting installation instructions.

3.5. Consider venting of the unit. Comply with local regulations. In the UK, comply with the following regulations, for Petrol Stations: Health and Safety Guidance Note 41 (HS(G)41), for other applications: BS8301: 1985 (obsolescent) BS EN 752 Building Drainage. Adequate ventilation should be provided to the separator. The ventilation pipe should be as short as is practicable and be terminated not less than 2.5m above paving nor less than 1m above the head of an openable window or other opening into a building within a horizontal distance of 3m. Each neck should be vented independently, we advise against joining these below ground prior to their rising as vent stacks.

3.6. Uncontaminated run off such as roof water should be excluded from separators. (EA Guidelines PPG3.)

3.7. Consider installation of a sampling point downstream of the separator as there is no suitable facility to effectively sample the waste water from inside the unit. (Suggested in EN 858 Pt 1).

3.8. Ground conditions and water table level should be assessed. If the water table will be above the base of the units at any time of the year, adequate concrete backfill must be provided to avoid flotation. In poorly draining ground, consideration should also be given to the likelihood of flotation due to surface water collecting in the backfill, and an appropriate installation method devised to avoid this.

3.9. If the discharge is to a soakaway, a porosity test should be carried out as part of the assessment of suitability for sub-soil drainage.

3.10. The separator must be installed at a level that will allow connection to the incoming drain and a free discharge at the system outlet.

3.11. Do not install the unit deeper than necessary, if required, ensure that you purchase extension necks and coalescer extensions. The minimum invert depth of the unit is shown on the customer drawing.

3.12. Adequate access must be provided for routine maintenance. Vehicles should not be permitted within a distance equal to the depth of the unit, unless suitable structural protection is provided to the installation.

3.13. There must be at least 1 metre of clear, level ground all around the access covers to allow for routine maintenance.

3.14. It is essential that a mains water supply is accessible for routine cleansing and refilling after removal of waste material and liquid.

3.15. Provide electrical supply for alarm system.

3.16. Installation should only be carried out by suitably qualified and experienced contractors in accordance with current Health and Safety Regulations. Electrical work should be carried out by a qualified electrician, working to the latest edition of IEE wiring regulations.

3.17. This unit is designed to operate with gravity in and out flows. The unit is not designed to operate with a pumped influent.

4.0 Installation – General

4.1. When units are installed in unstable ground conditions where movement of the surrounding material and/or unit may occur, the connecting pipework should be designed to minimise the risk of damage from differential movement of the unit(s) and/or surrounding material.

4.2. For separators with burial depths greater than 1000mm from cover level to the top of the unit, specific site conditions should be taken into consideration and the backfill designed to bear any loads which may be applied during and after installation to prevent the tank being subjected to these loads.

4.3. The excavation must be deep enough to provide bedding and cover depth as determined by the type of surface pavement and loading. Asphalt and concrete pads should extend a minimum of 300mm horizontally beyond the unit in all directions.

4.4. In situations where the excavation will not maintain a vertical wall, it will be necessary to shore up the side walls of the excavation with suitable trench sheets and bracing systems to maintain a vertical wall from the bottom to the top of the excavation. DO NOT completely remove the shoring system until the backfilling is complete, but before the concrete fully hardens.

4.5. In areas where the water table is above the bottom of the excavation and/or the excavation is liable to flood, the excavation should be dewatered using suitable pumping equipment and this should continue until the installation is complete.

4.6. During installation care must be taken to ensure that the body of any unit is uniformly supported so that point loads through the unit are avoided.

4.7. The Concrete Specification is not a site specific installation design.

GENERAL CONCRETE SPECIFICATION IN ACCORDANCE WITH BS EN 206-1 (BS 8500-1)		
TYPE OF MIX		(DC) DESIGN
PERMITTED TYPE OF CEMENT		BS 12 (OPC): BS 12 (RHPC): BS 4027 (SRPC)
PERMITTED TYPE OF AGGREGATE (coarse & fine)		BS 882
NOMINAL MAXIMUM SIZE OF AGGREGATE		20 mm
GRADES: C25 /30 C25 /30 C16 /20		REINFORCED & ABOVE GROUND WITH HOLDING DOWN BOLTS REINFORCED (EG. FOR HIGH WATER TABLE) UNREINFORCED (NORMAL CONDITIONS)
MINIMUM CEMENT CONTENT	C30 C20	270 - 280 Kg/M^3 220 - 230 Kg/M^3
SLUMP CLASS		S1 (25mm)
RATE OF SAMPLING		READY MIX CONCRETE SHOULD BE SUPPLIED COMPLETE WITH APPROPRIATE DELIVERY TICKET IN ACCORDANCE WITH BS EN 12350-1
NOTE: STANDARD MIXES SHOULD NOT BE USED WHERE SULPHATES OR OTHER AGGRESSIVE CHEMICALS EXIST IN GROUND WATER		

5.0 Separator Installation

5.1. Excavate a hole of sufficient length and width to accommodate the tank and a minimum 300mm concrete surround and to a depth that allows for the burial depth of the unit plus concrete base slab.

5.2. Construct a suitable concrete base slab appropriate to site conditions. Ensure that the slab is flat and level.

5.3. When the concrete base slab has set enough to support the installed load, add a concrete haunch so as to provide even support under the unit, and then lower the unit onto the haunch using suitable webbing slings and lifting equipment.

5.4. Locate the float valve in the coalescer unit(s). Lift float valve and secure in the open position before filling and release when full. If the valve is not lifted during filling, it may ”seat”. The valve is fitted with cord to aid lifting. Add cord if extending the invert and fasten end to a convenient point.

5.5. Pour no more than 300mm depth of clean water into the unit, avoiding shock loads. For units with more than one chamber, add water to each chamber simultaneously. DO NOT OVERFILL, the unit is not designed to hold water whilst unsupported. FILL THROUGH OUTLET AS WELL AS INLET.

5.6. Place concrete backfill to approximately 300mm depth under and to the sides of the tank ensuring good compaction to remove voids. DO NOT use vibrating pokers. Continue adding concrete backfill, simultaneously keeping the internal water level no more than 200mm above the backfill level at all times, until the backfill is just below the underside of the outlet drain, giving sufficient room to connect the inlet and outlet pipework.

5.7. Connect inlet and outlet drains and vent pipes when safe access to the backfill can be gained.

PIPEWORK CONNECTIONS

In all cases, ensure that the outlet pipework level is maintained for correct operation. (Unless specified on the order, the fall across the unit will be as per the customer drawings). Small units are generally fitted with **PVCu spigots** to both the outlet and the inlet. Connect using the same size PVCu socket or a suitable reducer. Larger units are generally fitted with our own **GRP** manufactured sockets. The connecting pipework should be pushed into the socket and a joint made to fill in the gap using rope/hemp with a cement mortar or bonding mix. Ensure that the seal is secure and watertight before backfilling the pipe. Alternatively, proprietary **flex seal couplings** can be obtained to fit over the outside of the site pipework and the outside of the GRP socket. When using this connection method, please be aware

that the outside GRP laminate is not perfectly regular and that you may need to use a sealant on the outside diameter of the GRP. Take care not to over tighten the coupling when connecting to the GRP

and ensure that the seal is secure before backfilling the pipe. Drawing DS0185 provides the ID of our GRP sockets. The OD is variable, as the wall thickness can be up to 15-20 mm. If purchasing a flex seal coupling for use with clay/concrete, we suggest that a size 110 mm larger than the ID is selected.

5.8. **Oil Level Alarm Neck fitting**

We will fit a tube to receive the oil alarm probe. This provides protection and ensures that the probe is positioned at the correct level to sense oil build up. See alarm supplier information and ensure that the probe is placed within the tube and can be accessed from ground level.

Continue backfilling with concrete over the tank body to the required level. Build up a shell of concrete, minimum 225mm thick, around the access shaft(s). Temporarily strut the access shaft to avoid distortion.

5.9. Where we supply an extension shaft to meet a deeper invert requirement, a coalescer extension chain is also provided when needed. If there is a coalescer, remove it from the unit before adding the extension shaft(s). It is advisable to seal the joints on the extension shafts (particularly on sites with high ground water) with proprietary sealant or by GRP lamination (if skilled operatives are available). Temporarily strut the extension neck(s) to avoid distortion during back filling. Where more than one neck section is required to suit a deep invert, consider back-filling section by section. If the extension neck is too long, it can be trimmed using a fine-toothed saw. The original fixing hole bolting the coalescer to the neck should be sealed. Ensure that the vent socket if cut out, is replaced elsewhere. The maximum recommended inlet invert is 2000mm (using 500mm long extension sections). If you are installing a unit deeper than this then you must make your own arrangements for removing and replacing the coalescer. Consideration must be given to the depth of lift involved.

5.10. If extending the neck, remember to add a suitable length of cord to enable the float valve to be lifted when the unit is emptied. If the valve is not raised during filling then the float valve may stick at the base.

5.11. Coalescer. When refitting, ensure that the core tube is correctly seated onto the base fitting.

5.12. Continue back-filling, ensuring minimum 225mm concrete thickness around the access shaft/ extension neck and alarm access tube (as applicable).

5.13. Mains powered alarm Systems. See alarm suppliers installation instructions. Lay 82mm diameter PVCu underground ducting between the alarm panel location and the alarm probe position. The ducting should be 500mm below ground level and fitted with a drawstring for later cable insertion. Any changes of direction should be by long radius bend. If necessary, drill a suitable hole in the access shaft adjacent to the alarm probe terminal box, to accept the ducting and seal.

5.14. In traffic areas a suitable top slab must be constructed. The top slab should bear on a suitable foundation to prevent superimposed loads being transmitted to the unit and access shafts. Loads applied to covers and frames must bear on the top slab, not the access shaft.

5.15. The unit should be filled with clean water up to the invert level of the outlet pipe. Ensure the unit identification is placed/marked inside the neck for future information. The unit is now ready for use.

6.0 Alarm Installation

6.1 Install the alarm probe and control panel, as per the Suppliers Alarm Installation Guidelines. Ensure that the probe is positioned correctly for the required storage of oil. The table below indicates the volume of oil stored and the depth of floating oil expected in the separation chamber.

Unit	Recommended Maximum Oil Storage volume	Max. Depth of floating oil (100 %) (Static)
NSFA080	800 litres	100mm
NSFA100	1000 litres	110mm
NSFA125	1250 litres	110mm
NSFA150	1500 litres	110mm
NSFA175	1750 litres	105mm
NSFA200	2000 litres	110mm
NSFA210	2100 litres	115mm
NSFA225	2250 litres	115mm
NSFA240	2400 litres	115mm
NSFA255	2550 litres	115mm
NSFA270	2700 litres	115mm
NSFA285	2850 litres	115mm

7.0 Operation

7.1 The unit is sized on treating a defined area and rainfall (50 mm/hour) EN 858 Part 1, and using the factor provided in the EA guidelines PPG 3. The entire flow up to the units listed flow rating is fully treated.

7.2 Units include a core tube with replaceable media. Separated Liquid enters the core tube after passing through the media, to the outlet. The coalescer media requires maintenance and replacement at intervals. See section 8.

7.3 Units are provided with a closure device, incorporating a float. As the level of oil builds up and forms a floating layer, so the float/closure device moves downward to prevent oily water being passed through the unit. The unit **MUST** be emptied after the closure device has operated. The coalescer media should be inspected and changed if fouled.

7.4 An oil probe should be positioned to detect the accumulation of oil when there is no or low flow conditions. It is a requirement to position the probe so that the alarm operates at 90% of the maximum recommended oil storage volume. **When the alarm operates, the oil should be removed. Accumulated silt should also be removed.**

7.5 These Separators are not effective for the removal of soluble or emulsified pollutants such as oil/detergent mixes found in vehicle wash effluents. With permission, such discharges may be drained to the foul sewer. See Environment Agency Guidelines PPG3. Or contact our Technical Sales Department for suitable alternative equipment.

8.0 Maintenance

Separated light liquid **must** be removed from the separator when the oil capacity has been reached.

8.1. An oil level alarm system is available which gives warning when the separated light liquid/water interface level reaches 90% of the maximum recommended oil storage volume.

8.2. Separators should be inspected at least every six months or more frequently if experience dictates. A log should be maintained detailing the depth of oil found, any volume removed and any silt removal or cleaning carried out. A specimen maintenance log is included in the appendices.

8.3. Every site is different, in respect to the amount and type of silt generated by the drain design and installation. Frequently, the site construction programme itself generates large and perhaps unusual quantities of silt and grit. We recommend that following the initial installation, an inspection of the separator contents be made to check that building rubble has not entered the unit. Further inspections at 3 and 6 months should be made so as to be able to assess the volumes of silt and oil accumulated. An inspection and emptying programme can then be defined following the first 6 months site experience. We recommend a maximum inspection interval of 6 months.

8.4. Coalescer media is a replaceable item and is available as a spare.

8.5. Alarm probes should be removed and cleaned with water whenever waste material is removed from the separator. Please note the alarm may alert until the liquid level is replaced. Consult the alarm supplier's literature.

8.6. If the unit is emptied, the float/closure device should be raised and lowered only after the unit has been refilled. (Do not lower it into an empty unit as the closure device will self seat)

8.7. **Separator waste is a "special waste" under the terms of The Waste Management Code of Practice. The Code imposes a duty of care on the waste producer to ensure that the Cleansing contractor is registered with the Environment Agency and that the final disposal of the waste is to a licensed facility.**

8.8. You should consider the purchase of a maintenance service, from a competent installer, which includes bi-annual inspections, removal of oil and silt, cleaning of the alarm probe and cleaning or replacement of the coalescer media (where appropriate).

Waste Removal Procedure – Oil & Silt

Oil should only be removed when there is no flow entering the unit. Isolate the unit and prevent flow from entering. Always remove the oil before attempting to remove the coalescer. If this is not done, when the coalescer is withdrawn, any excess oil may coat the media surface and when replaced could contaminate the effluent.

8.9. Remove the access cover and lower the desludging hose into the separation chamber. Draw off the surface oil.

8.10. When removing the silt, lower the desludging hose to the base of the tank and withdraw any grit or sludge that may be present. It is not necessary to remove all the liquid unless you need to ensure the unit has been fully emptied. Ensure that you access and clean all compartments.

8.11. Remove the alarm probe, clean with water and replace. Ensure that it is working correctly

8.12. Consider the period of time that the coalescer has been installed and consider removing and inspecting (cleaning or replacing) the coalescer media. If removed, ensure that it is correctly replaced and secured into position. It is best to lower the liquid level when refitting. Replace the access covers.

8.13. Re-fill the separator with clean water up to the outlet level. The alarm may display an alarm condition until the separator is re-filled. Check alarm operation when unit full.

8.14. Check the float/closure device and raise, if it has self-seated.

Checking the Coalescer Assembly

8.15. Coalescers should be checked and cleaned regularly, also following a major incident replaced if necessary. It may be possible to squeeze/rinse out silt contamination from the media, but it is impossible to remove oil. Please contact Kingspan if you wish to purchase replacement coalescer foam media. Identify the type and size of separator (shown on labels inside the access neck).

8.16. Assemblies weighing less than 25 Kg may be removed by hand. Heavier assemblies should be lifted by mechanical means. Any lifting device employed must be capable of lifting:

- In excess of the maximum assembly weight.
- The assembly completely out of the access shaft.

- Giving a smooth and controlled lift.
- Swinging the assembly to one side clear of the access shaft.

Units	Dry Weight (Kg) Core tube & media	Wet Weight (Kg) Core tube & media	Silted Weight (Kg) Core tube & media	Replacement media part no.
NSFA080 to NSFA285 Incl.	32 kg	45 kg	≈ 55 kg	402733

8.17. Ensure that the area around the access shaft is clear and that there is space to place the coalescer core tube assembly once removed. If space is not available it will be necessary to support the assembly over the access shaft e.g. by scaffold poles and platform.

8.18. Only remove the access cover when necessary to remove the assembly. Do not leave the access shaft uncovered and unattended.

8.19. It is recommended that core tubes be lifted by mechanical means, especially if it is suspected that the coalescer media be silted.

8.20. Removing the coalescer assembly.

8.21. A cut out is provided in the top of the coalescer tube to aid lifting. When the unit is installed the coalescer tube is bolted to the neck. Deeper invert units are provided with a coalescer tube extension chain of the appropriate length.

8.22. Lift the assembly with a smooth and steady motion. Core tubes and media will become lighter as water drains from the exposed media. Allow the water to drain completely. Assemblies blocked with fine silt may be very heavy.

8.23. Fully extract the assembly and set it down adjacent to the access shaft. Consider cleaning or replacement of the media.

8.24. Cleaning the coalescer assembly /Media Replacement.

8.25. Hose down the assembly using clean water at normal pressure. (You may be able to return the cleaning water into the separator, if there is sufficient separator capacity.) Do not allow untreated cleaning water to pass out of the unit. Continue hosing media until the water runs clear. If the media is heavily contaminated with oil and silt it may not be possible to clean effectively by hosing and should be replaced.

8.26. When replacing the media, undo the banding. Slide media off the core tube and slide new media on. Ensure all the apertures on the core tube are covered by the media. Re-secure or replace banding. Consider replacing media every two years.

8.27. Replacing the coalescer assembly.

8.28. Position coalescer assembly over the access shaft and remove any safety coverings.

8.29. Lower the assembly steadily into the access shaft, orientate core tube correctly and locate over sump cone. Check the float/closure device is free to operate.

9.0 Emergencies

9.1. At sites where there is a high risk of spillage, spill kits containing drain seals, absorbent materials, disposal containers and other appropriate equipment should be held. In the event of a spillage on site, the material should be contained, (if a spill kit is not available, sand or soil may be used) and the Environment Agency notified immediately using the appropriate emergency hotline number listed in the Agency Guideline PPG3. Year 2011 – 0800 80 70 60

SEPARATOR MAINTENANCE LOG

Site address/location .....

.....

Separator location .....

.....

Type of separator .....

Nominal Flow .....

Total capacity .....

Inspection/ Maintenance Date	Comments	Waste Volumes Removed (if appropriate)

NS GRP FULL RETENTION SEPARATORS DECLARATION OF PERFORMANCE

No. KEL-CPR-009

1. Unique identification code of the product-type:

Separator Systems for Light Liquids, GRP Construction
NSFA010 & NSFA285

2. Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4) of the CPR:

Serial Number/Works Order Number printed on the Product Information Label & affixed to product

3. Intended use or uses of the construction product, in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer:

Collection & Separation of Light Liquids from Waste Water by means of gravity and/or coalescence

4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required under Article 11(5):

Kingspan Environmental Ltd
College Rd North
Aston Clinton, Aylesbury, Buckinghamshire
HP22 5EW

5. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2):

N/A

6. System or systems of assessment and verification of constancy of performance of the construction product as set out in CPR, Annex V:

System 3

7. In case of the declaration of performance concerning a construction product covered by a harmonized standard:

EN 858-1:2002
BSI, Maylands Avenue, Hemel Hempstead, Herts HP2 4SQ
Has executed initial type testing according to system 3 and delivered the test report

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180 Gilford Road, Portadown
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+44 (0) 28 3836 4445
enquiry@kingspanenv.com
kingspanenv.com

Registered in N. Ireland
Company Reg. No. NI17631

8. Declared performance:

Essential Characteristics		Performance			Harmonised technical specification
Crushing Resistance (vertical load test)		Pass (also wet conditions)			EN 858-1:2002
Structural Behaviour		Pass			
Resistance to fire		Class E			
Water Tightness (water test)		Pass			
Material Durability		MFR (230/2,16) = (5,0± 3,0g)/10 min (EN ISO1133)			
		Density ≥ 905 kg/m³ (EN ISO 1133)			
		Yield Stress ≥ 30 Mpa (EN ISO 527-2)			
		Creep Factor $\alpha_{material}$ = 0,48 (average value)			
		Ageing Factor (β) = 0,46 (average value)			
Treatment Efficiency	Sample	Specified Maximum Light Liquid (mg/l)	Actual Light Liquid (mg/l)		
	1	≤10	<0.100	Pass	
	2	≤10	0.130	Pass	
	3	≤10	<0.100	Pass	
	4	≤10	<0.100	Pass	
	5	≤10	<0.100	Pass	
	Average	≤5	<0.106	Pass	
Electrical Consumption		n/a			

Signed for and on behalf of the manufacturer by:

Paul Copping – Business Unit Director

.....

(Name and function)

Aylesbury – 27th April 2018

.....

(Place and date of issue)

.....

(Signature)

KINGSPAN ENVIRONMENTAL LTD
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Registered in N. Ireland
Company Reg. No. NI17631

Appendix E – BRE 365 Infiltration Results

IRISH DRILLING LTD.
Loughrea Co. Galway

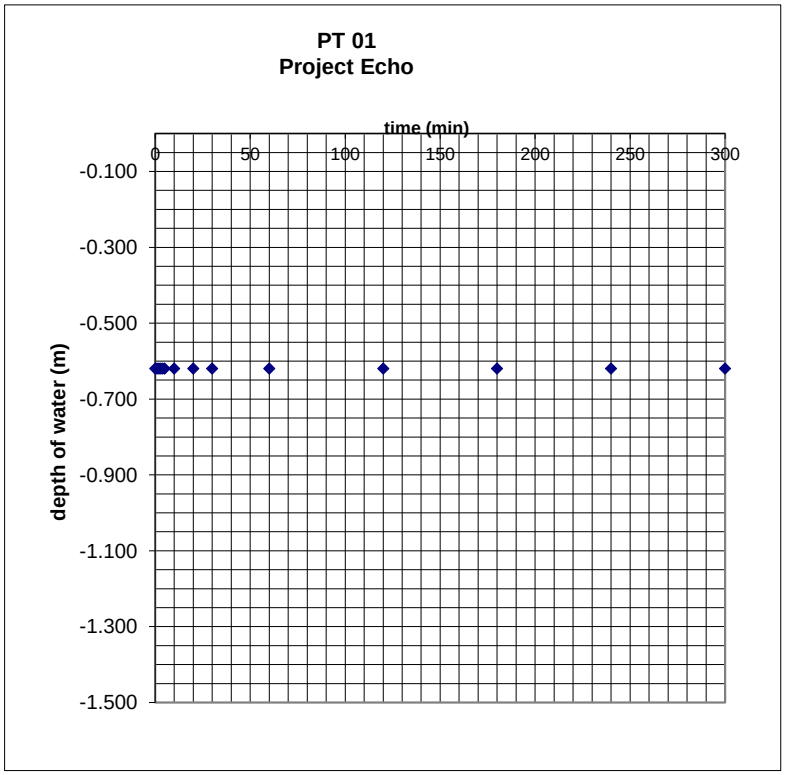
Tel: (091) 841274 Fax: (091) 847687

Contract:	Project Echo
Client:	SSE
Engineer:	Aecom
Date:	04/03/2019
Tested by:	DK

INFILTRATION TEST

PT-01 Top of water level: 0.62 m
1st FILL Base of trial pit: 1.30 m base on soil
Area of trial pit: 2.6 x 0.6
Co-Ordinates: 706616.8E,770876.9N

time min	WL m
0	-0.620
1	-0.620
2	-0.620
3	-0.620
4	-0.620
5	-0.620
10	-0.620
20	-0.620
30	-0.620
60	-0.620
120	-0.620
180	-0.620
240	-0.620
300	-0.620



a= 3.74m2
v= 0.53m3
t75-t25= N/A

Result:
Soil Infiltration Rate: No Infiltration recorded after 5hours.

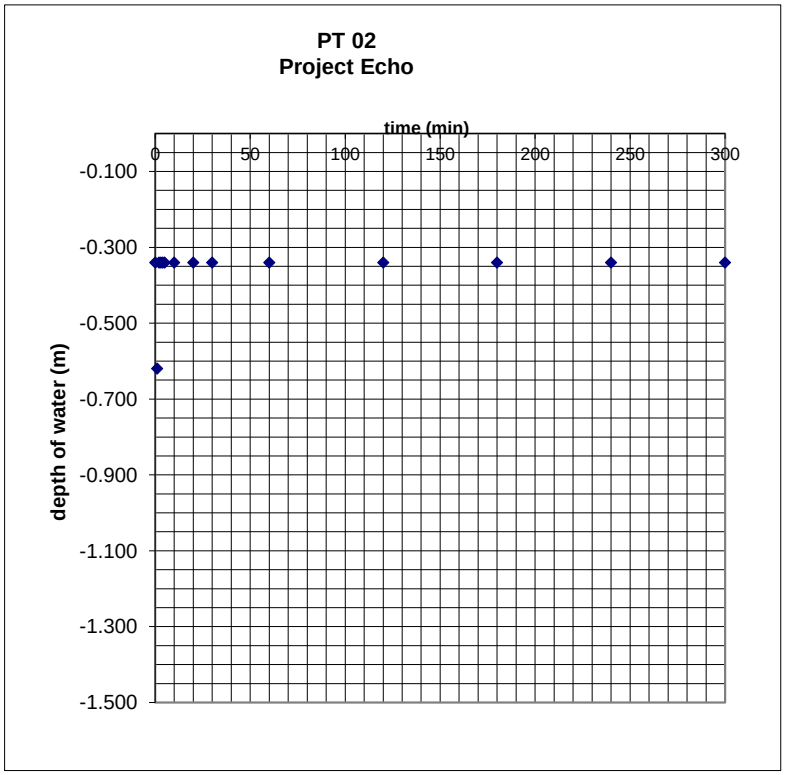
75% effective depth	-0.79
25% effective depth	-1.13
Vp75-25	0.5304
ap50	3.736
tp75-25	N/A
f	#VALUE!

IRISH DRILLING LTD. Loughrea Co. Galway Tel: (091) 841274 Fax: (091) 847687	*Contract:* Project Echo *Client:* SSE *Engineer:* Aecom *Date:* 04/03/2019 *Tested by:* DK

INFILTRATION TEST

PT-02 Top of water level: 0.34 m
1st FILL Base of trial pit: 1.45 m base on soil
Area of trial pit: 2.75 x 0.6
Co-Ordinates: 706598.9E, 770669.1N

time min	WL m
0	-0.340
1	-0.620
2	-0.340
3	-0.340
4	-0.340
5	-0.340
10	-0.340
20	-0.340
30	-0.340
60	-0.340
120	-0.340
180	-0.340
240	-0.340
300	-0.340



a= 5.37m2
v= 0.92m3
t75-t25= N/A

Result:
Soil Infiltration Rate: No Infiltration recorded after 5hours.

75% effective depth	-0.6175
25% effective depth	-1.1725
Vp75-25	0.91575
ap50	5.3685
tp75-25	N/A
f	#VALUE!

Attachment 7

Caulstown Carranstown Conservation Plan

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PROPOSED OCGT POWER PLANT

CARRANSTOWN & CAULSTOWN
DULEEK
CO. MEATH

Archaeological Conservation Plan

Submission to: Meath County Council
Planning Reg. No. LB/190031

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1 INTRODUCTION

1. 1 Terms of Reference and Scope of Works

SSE Generation (Ireland) Ltd. have been granted planning permission by Meath County Council to construct an Open Cycle Gas Turbine (OCGT) Generating Plant in Carranstown and Caulstown, Platin, Duleek. Condition no. 8a of the grant of planning has requested that a Conservation Plan be prepared in respect of an embanked enclosure (ME027-078) located in the northwest corner of the development site. A geophysical survey (Leigh 2018) identified a small D-shaped enclosure (ME027-078001) within the embanked monument and the test excavation carried out in February 2019 under Licence No. 19E0019 as part of the archaeological impact assessment exposed additional archaeological features in the lands proposed for development. The archaeological impact assessment was included in the Request for Further Information (RFI) response.

This Conservation Plan has been prepared as a response to Condition no. 8a of the grant of planning permission. The report will provide information on the archaeological features that are present on the site, identify the limitations that are associated with these features, appraise the potential for the proposed development to have significant impact on the monument and recommend appropriate mitigation for its future conservation. Additionally, the plan will demonstrate how the monument may be presented to the public through the use of appropriate informative signage.

The report has been compiled by Margaret McCarthy who is a senior consultant archaeologist with over twenty years of experience as a director on a range of projects both in Ireland and the UK. She holds a Master's degree in Archaeology from University College Cork and is a full member of the Institute of Irish Archaeologists (IAI). She is fully licensed by the Department of Arts, Heritage and the Gaeltacht to direct all archaeological investigations including excavation, testing and monitoring.

1.2 Objectives of the Conservation Plan

The purpose of this Conservation Plan is to identify the significance of the archaeological monument present on the site and to propose policies and actions for its future protection.

1.3 The Proposed Development

SSE Generation (Ireland) Ltd. propose to construct an electrical output Open Cycle Gas Turbine (OCGT) at their site in Carranstown and Caulstown, Duleek. The main features of the proposed development are as follows:

- The construction of a 208 MW distillate-fired power generating plant including transformers, fuel tank and MV switchgear
- Site office and ancillary services building
- Water storage and treatment facilities

- A connection at the site boundary to the municipal sewer system

2 LEGISLATIVE FRAMEWORK

2.1 Current Legislation

Ireland has committed to the protection of its archaeological and architectural heritage by being a signatory to two international conventions that aim to protect cultural heritage. These are:

- The 1985 *European Convention on the Protection of Architectural Heritage* (The Granada Convention), which aims to make provision for the protection of monuments, groups of buildings and sites that are of 'historical, archaeological, artistic, scientific, social or technical interest'

- The 1992 *European Convention on the Protection of the Archaeological Heritage* (The Valetta Convention), which aims to 'protect the archaeological heritage as a source of the European collective memory and an instrument for historical and scientific study'

- Provisions made in these conventions have been written into Irish Law via the National Monuments (Amendments) Acts 1930-2004, the Heritage Act 1995, the Cultural Institutions Act 1997, the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999, Architectural Heritage Protection Guidelines 2004 and the various Planning and Developments Acts 2000-2015. The policy of the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs in relation to the protection of our archaeological and architectural heritage is set out in the Frameworks and Principals for the Protection of the Archaeological Heritage (Government Publication 1999) which may be downloaded from the departmental website www.archaeology.ie. The National Monuments Act 1930 and its subsequent amendments of 1954, 1987, 1994 and 2004 provide for the protection of the archaeological heritage which includes monuments, buildings, ship-wrecks and archaeological artefacts. A level of universal protection is afforded to all monuments listed in the Record of Monuments and Places (RMP) which was established under Section 12 of the National Monuments (Amendment) Act 1994. While all known monuments are included on the RMP, a lesser number are entered on the Register of Historic Monuments established under Section 5 of the National Monuments (Amendment) Act 1987. Monuments that are considered to be of national significance are afforded the highest level of protection and are referred to as National Monuments.

2.2 Meath County Development Plan 2013-2019

The Meath County Development Plan 2013-2019 outlines a number of policies and objectives relating to archaeological and architectural heritage. The Council is committed to the preservation and protection of its rich archaeological and architectural resource and has regard to the recommendations of the Department of Culture, Heritage and the Gaeltacht when considering proposals with potential to affect that heritage. The Planning Authority recommends that potential developers consult as early as

possible with the relevant agencies, such as the National Monuments Service of the DCHG and the Planning Section of Meath County Council, in order to ensure that archaeological and architectural concerns can be integrated into development proposals at as early a stage as possible. The principal policies and objectives of Chapter 9 of the plan are outlined below.

The principal policies relating to archaeological heritage include:

CSA SP 1: To ensure that the unique cultural heritage of Meath is protected, conserved and sensitively integrated into the sustainable development of the county for the benefit of present and future generations.

CSA SP 2: To ensure that features of Meath's natural heritage and green infrastructure that provide ecosystem services are protected; that biodiversity is conserved and Chapter 9 Cultural and Natural Assets Meath County Development Plan 2013-2019 167 where possible enhanced, and; that the character of landscapes are maintained and enriched, and that tourist and recreational uses are facilitated in a sensitive manner.

CSA SP 3: To promote the understanding of County Meath's landscape in terms of its inherent and unique character and to recognise what elements should be preserved, conserved or enhanced.

CSA SP 4: To implement, in partnership with the County Meath Heritage Forum, relevant stakeholders and the community, the County Meath Heritage Plan and any revisions thereof.

CH POL 6: To promote awareness of, and access to, the archaeological inheritance of County Meath.

CH POL 7: To ensure that development in the immediate vicinity of a recorded monument is sensitively sited and designed so that it does not significantly detract from the monument. Where upstanding remains exist, a visual impact assessment may be required.

CH POL 8: To retain surviving medieval plots and street patterns in the villages and towns of Meath, where practicable, and in the course of development to record evidence of ancient boundaries, layouts, etc.

CH POL 9: To inform and seek guidance from the National Museum of Ireland if an unrecorded archaeological object is discovered, or the National Monuments Service of the Department of Arts, Heritage and the Gaeltacht in the case of the discovery of an unrecorded archaeological site, in accordance with National Monuments legislation.

The principal objectives relating to archaeological heritage include:

CH OBJ 7: To protect archaeological sites and monuments, underwater archaeology, and archaeological objects, which are listed in the Record of Monuments and Places, and to seek their preservation in situ (or at a minimum, preservation by record) through the planning process.

CH OBJ 8: To seek to protect important archaeological landscapes from inappropriate development.

CH OBJ 9: To make the Record of Monuments and Places (RMP) available to the public in the Planning Office and maintain a link on the Meath website to the on-line edition at www.archaeology.ie.

CH OBJ 10: To establish in-house training programmes for Council staff carrying out repair and maintenance works to historic structures, subject to the availability of resources.

CH OBJ 11: To encourage and promote the appropriate management and maintenance of the County's archaeological heritage, including historical burial grounds, in accordance with conservation principles and best practice guidelines.

CH OBJ 12: To consider the establishment of a National Monuments Advisory Committee for Meath, subject to available resources.

3 PLANNING BACKGROUND

Following the initial submission of the planning application in January 2019, Meath County Council under planning register number LB/190031 issued a request for further information (RFI) to include an archaeological impact assessment. A test excavation was carried out as part of the impact assessment and the results were submitted by PM Group on behalf of SSE Generation (Ireland) Ltd. in March 2019.

In June 2019 Meath County Council issued a Notification of Decision to GRANT planning permission for the development. This conservation plan is being undertaken as a response to Condition 8a of the Notification of Decision to grant planning permission (LB/190031) which states the following:

> 8a *The archaeologist will submit a Conservation Plan in respect of the earthen embanked enclosure. The Conservation Plan will address the protection of the site through all phases of the development and also address how the site will be protected and conserved in the future and any land-use issues than may arise. The Plan will be submitted to the Planning Authority and to this Department for comment and agreement in advance of the commencement of any construction work at the development site.*

4 CONSULTATION

4.1 Heritage Officer, Meath County Council

The Heritage Officer for Co. Meath was consulted as part of the research for this Conservation Plan.

4.2 Department of Archaeology, University College Dublin

Dr Stephen Davies, Department of Archaeology, University College Dublin was consulted as part of the research for this Conservation Plan. The writer is grateful to Dr Davies for supplying the LiDAR image of the earthen embanked enclosure (ME027-078) that forms the subject of this report.

5 THE RECEIVING ENVIRONMENT

The proposed development site is located in Carranstown and Caulstown townlands 2.7km northeast of Duleek in a greenfield site owned by SSE Generation Ireland Ltd. (Figure 1). The site is located in an area that is becoming increasingly industrialised and Irish Cement Ltd. and the Indaver Waste to Energy facility are located to the immediate north and northwest across the R152 road. The proposed development site comprises a single field of approximately 10.7ha surrounded on all sides by well-wooded hedgerows (Figures 2-3, Plate 1). The townland boundary for Caulstown/Carranstown forms the south-western boundary to the site. The general landscape character surrounding the development site comprises a mixture of industrial development and agricultural land of arable and pastoral fields together with some detached residential housing flanking both sides of the R152. Views to the north are obscured by the Irish Concrete plant in Platin townland and the Indaver incinerator facility in the adjacent townland of Carranstown. There are pleasant rural views to the south, east and west across the open and well managed agricultural landscape of east Co. Meath.

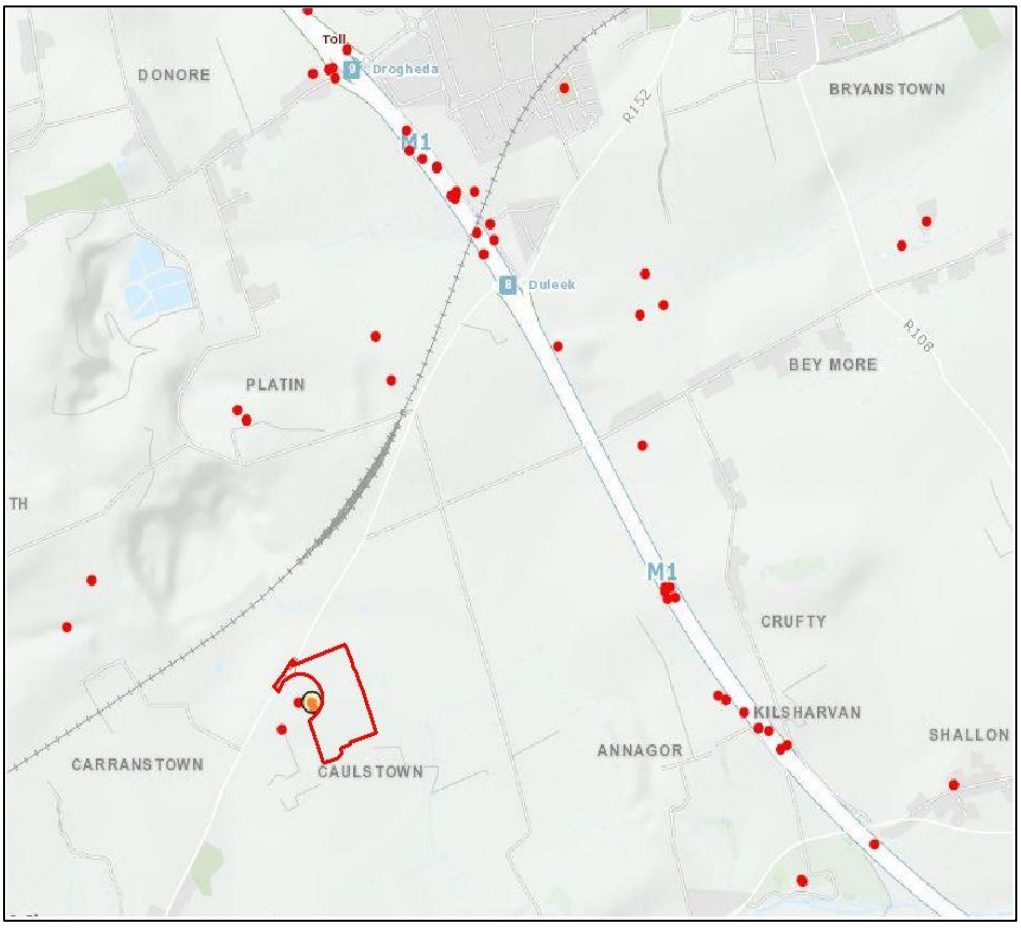

Figure 1: Location of proposed development

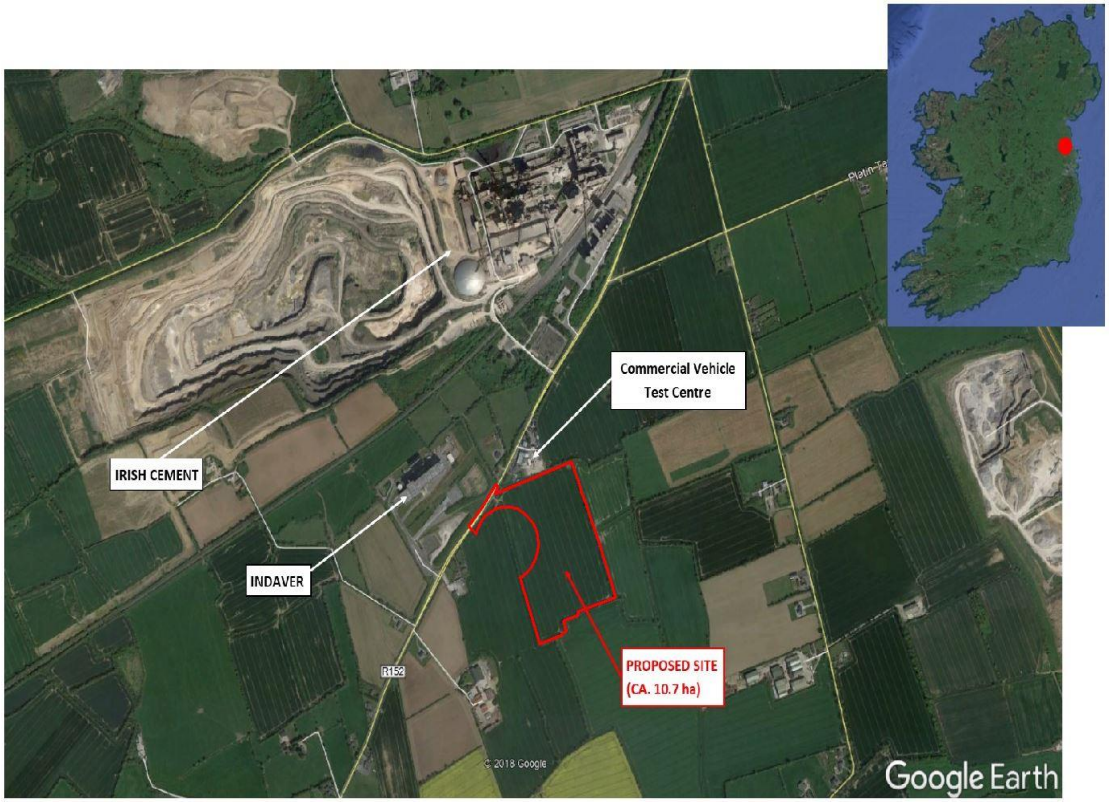

Figure 2: Aerial image with proposed development site outlined in red

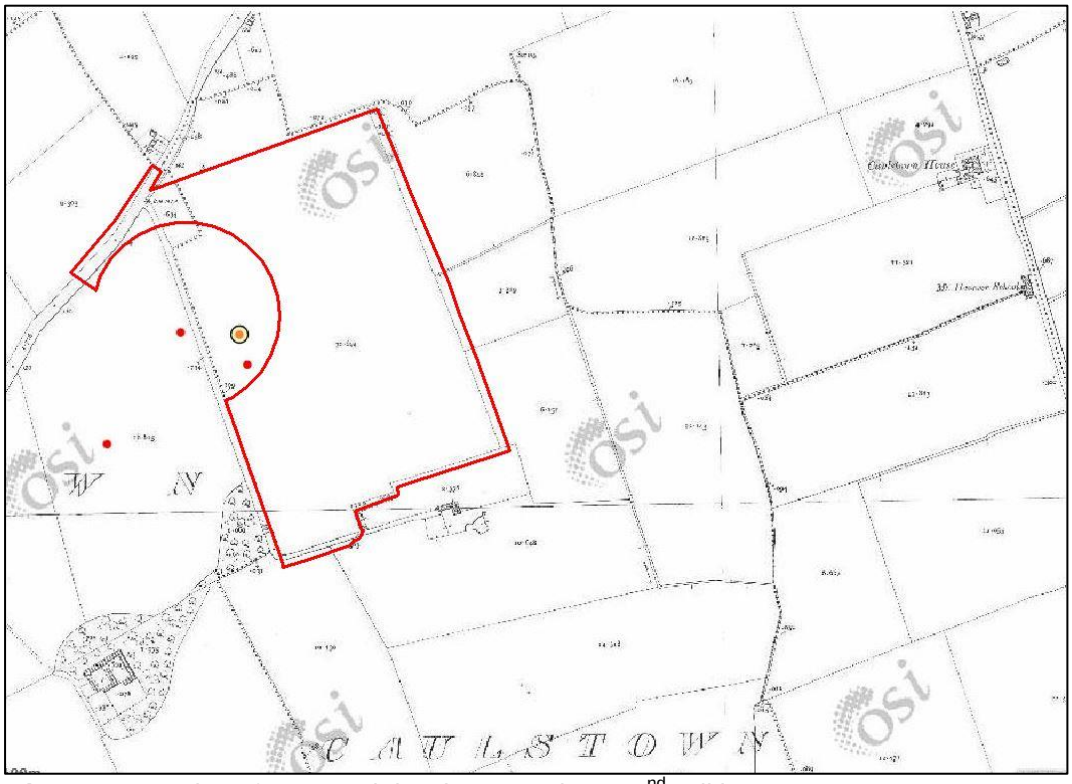

Figure 3: Location of proposed development site on 2nd Edition OS map

Plate 1: Proposed development site looking north from south-west corner of site boundary towards the Irish Cement Works Factory

6 ARCHAEOLOGICAL BACKGROUND

6.1 Recorded archaeological monuments within the proposed development

Two redundant archaeological monuments were originally recorded for the proposed development lands; one (ME027-079) located within the boundary of the proposed development, the other (ME027-078) in a field to the immediate northwest. During the desktop research for the Archaeology, Architecture and Cultural Heritage Chapter for the Environmental Report prepared in 2018 (PM Group Report No. IE0312377-22-RP-0001), the writer was made aware that Dr Stephen Davis, Department of Archaeology, University College Dublin carried out geophysical survey and LiDar imagery of the field proposed for development in 2016 as part of his research into the ritual landscape of Co. Meath. The results of the survey combined with a high-resolution LiDAR (Light detection and radar) image of the field has shown that a substantial embanked enclosure exists at the location of the two sites (ME027-078 and ME027-079) that were registered in the Record of Monuments and Places (RMP) in 2018 as redundant records (Figure 4). While the results of the geophysical survey did not reveal the circuit of the enclosure in its entirety, the LiDAR image clearly shows that a substantial henge-type monument (*c.* 120m internal diameter) survives beneath the surface almost half of which extends into the northwest side of the lands proposed for development (Figure 5; Davis, pers. comm.).[1] The sites were originally described by the National Monuments Service as potential large enclosures from an inspection of aerial images but subsequent field survey in 1987 indicated that there was no evidence for an enclosure at either site and

5 The writer acknowledges the assistance of Dr Stephen Davis, UCD with this research and is grateful for his permission to include the LiDAR image in the report

they were subsequently listed as redundant records (www.archaeology.ie). Since then, the use of detection methods including geophysical survey and LiDAR technology demonstrates beyond doubt that a significant embanked enclosure similar to many other prehistoric ritual monuments in the Boyne valley survives beneath the ground at this location. Dr Davis notified the National Monuments Service of the existence of the monument and it has now been classified as an embanked enclosure (ME027-078) defined by a broad bank feature with an external diameter of 200m. This monument is now subject to statutory protection.

The LiDar image also shows a linear feature extending in a north-south direction across the central area of the development site (Figure 5). This may represent an early field boundary as it is aligned with an existing field boundary to the north. The possible boundary is not shown on the 1st edition of the Ordnance Survey map indicating that it had been removed from the landscape by the mid-19th century.

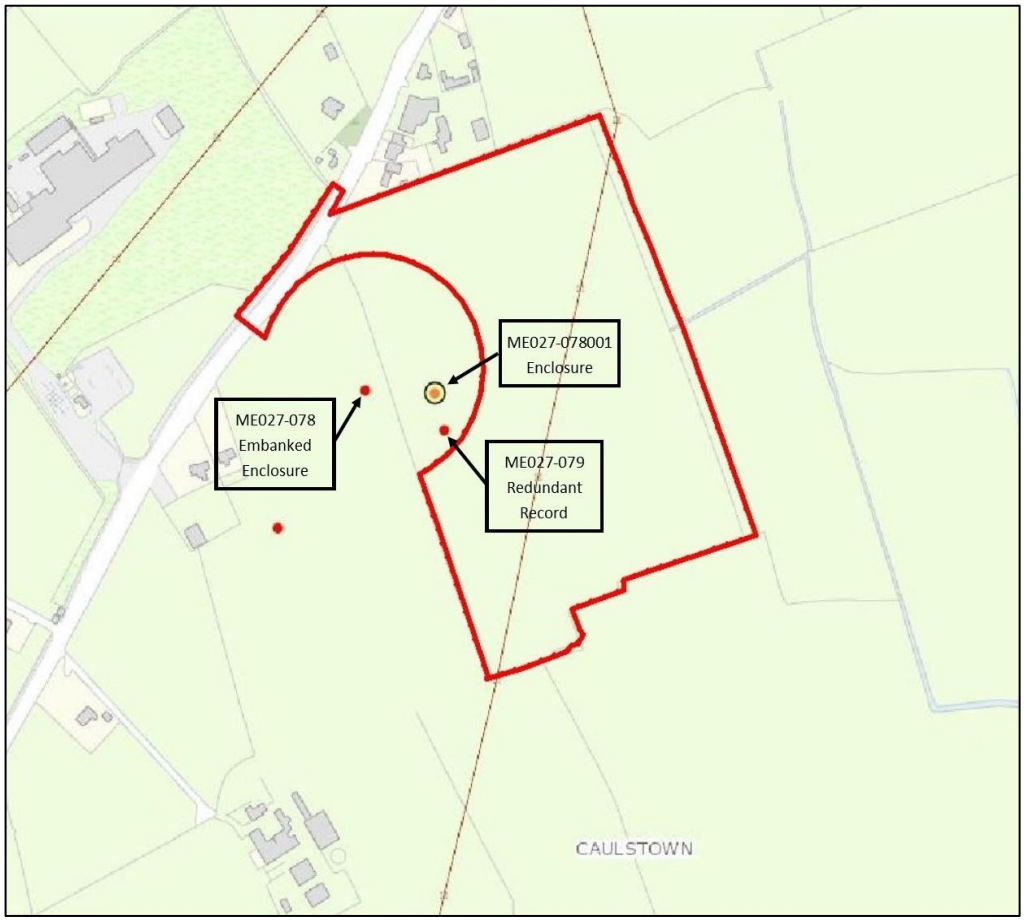

Figure 4: Extract from OSI map showing redundant archaeological records within and to the west side of the proposed development site (outlined in red)

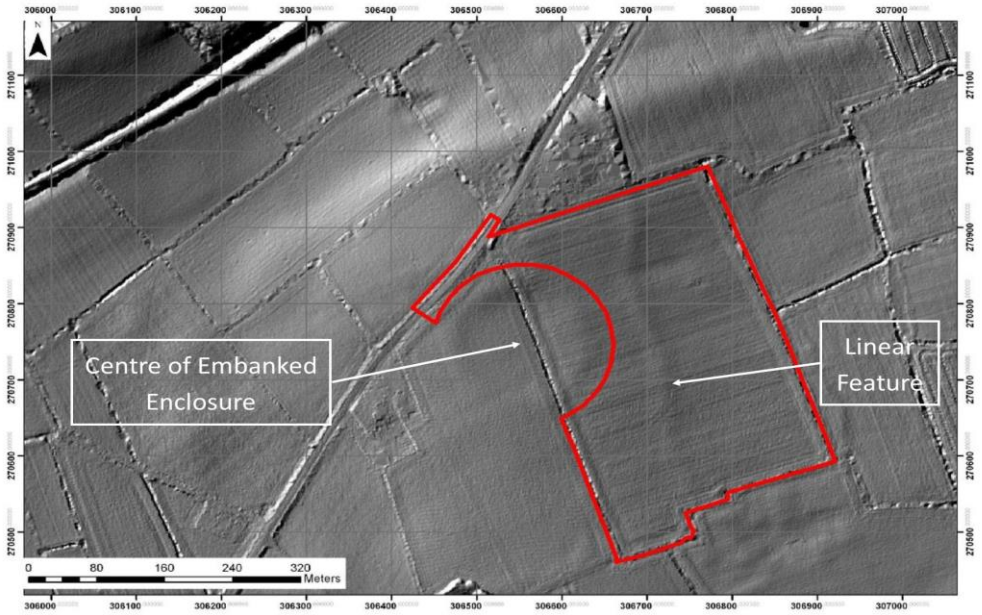

Figure 5: LiDAR image showing substantial embanked enclosure extending into the north-west side of the lands proposed for development (courtesy of Dr Stephen Davis)

6.2 Geophysical survey of lands - 2018

A further geophysical survey was carried out in November 2018 by J. M. Leigh Surveys Ltd. under Licence 18-R-0231 (report date: 06/12/2018 – full report included as Attachment 4 of the OCGT Generating Plant Environmental Report (PM Group Report No. IE0312377-22-RP-0001) which accompanied planning application no. LB190031. The gradiometery survey did not show any trace of the enclosing bank that is so clearly visible on the LiDar imagery or geophysical survey but it did identify a small D-shaped enclosure (ME027-078001) inside its perimeter and another less certain feature to the south. A number of potential archaeological features were identified in other areas of the field proposed for development and some of these were recognised during the test excavation. The result of the gradiometry survey is provided in Figure 6.

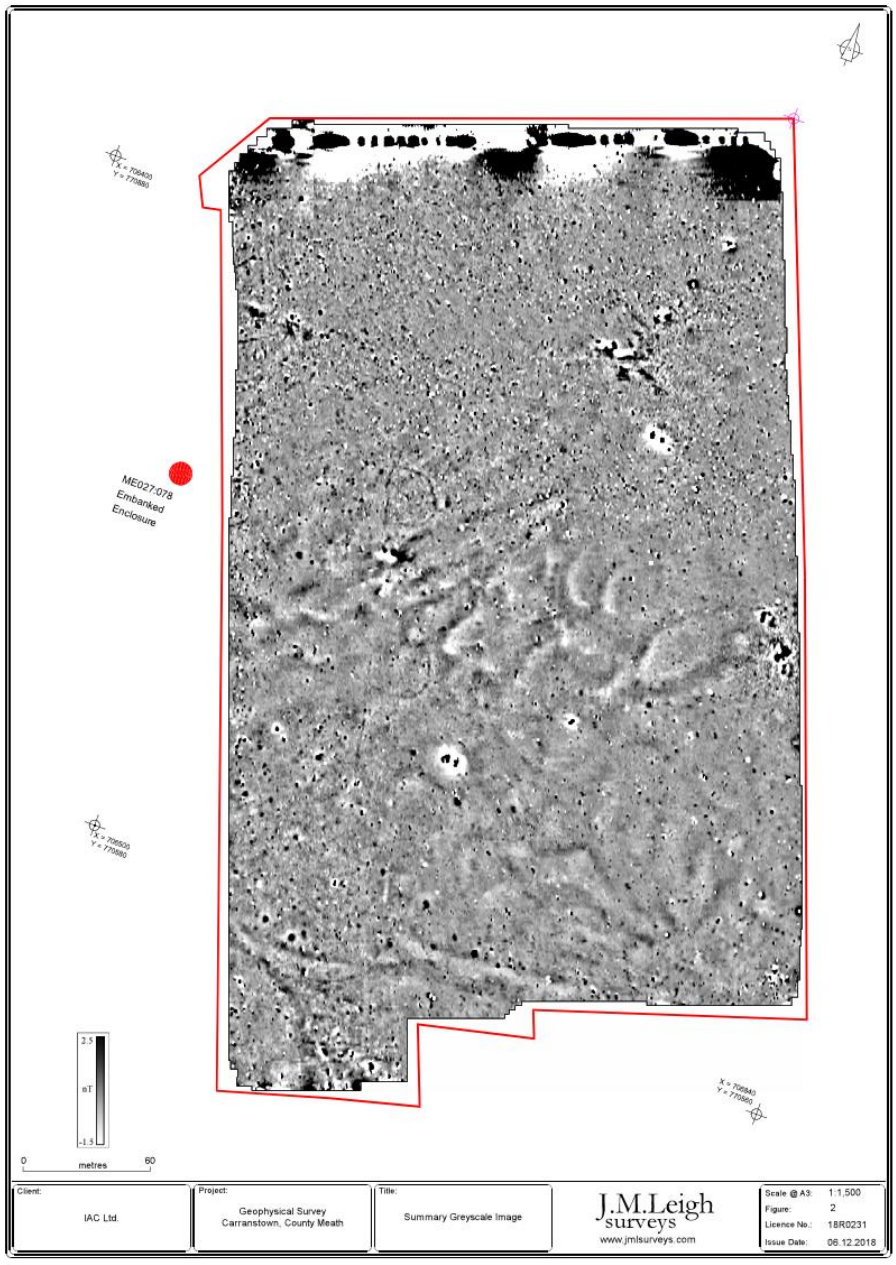

Figure 6: Gradiometry survey image from J. M. Leigh Surveys Ltd. report.

6.3 Archaeological Test Excavation of proposed development site – 2019

The OCGT power plant has been designed in order to avoid the embanked enclosure (ME027-078) visible on the LiDAR imagery. A zone of exclusion measuring 25m in width has been established extending from the outer edge of the monument as defined on the LiDAR image (Figure 7). The archaeological test excavation carried out in February 2019 did not encroach either into the area of the monument or the exclusion zone established around it. Placement of the 15 test trenches was dictated by the presence of an 110kV electricity line traversing in a northeast-southwest direction across the field and a wayleave measuring 50m in width beneath the line. The

location of the test trenches is shown in Figure 8 and the results are briefly summarised below.

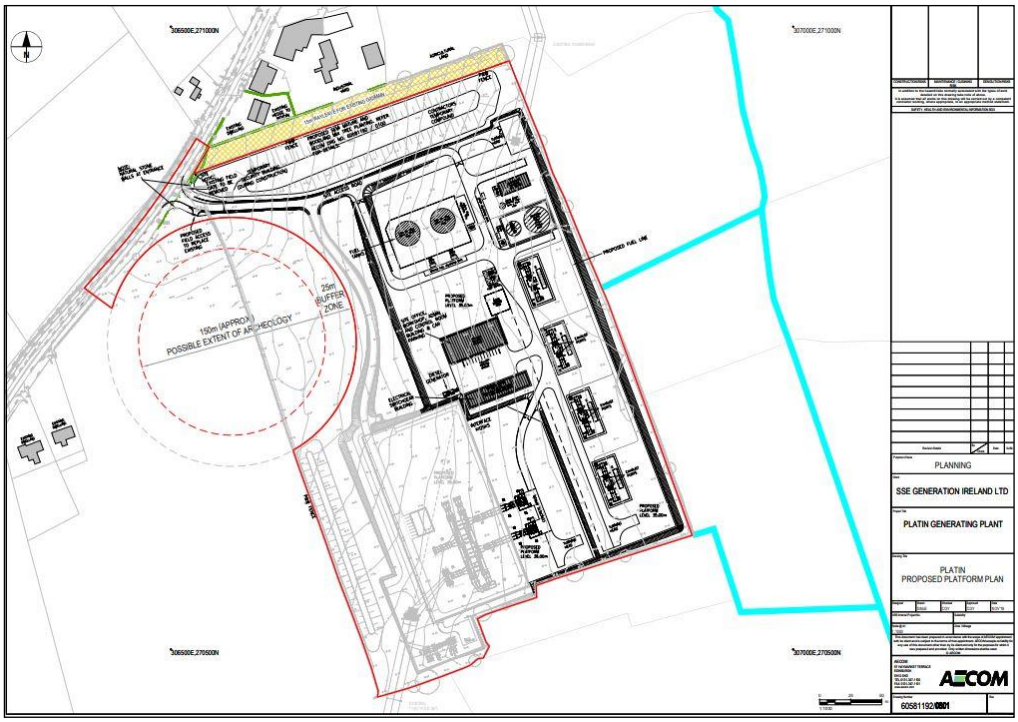

Figure 7: Proposed development showing buffer zone established embanked enclosure (ME027-078) in the northwest corner of the site

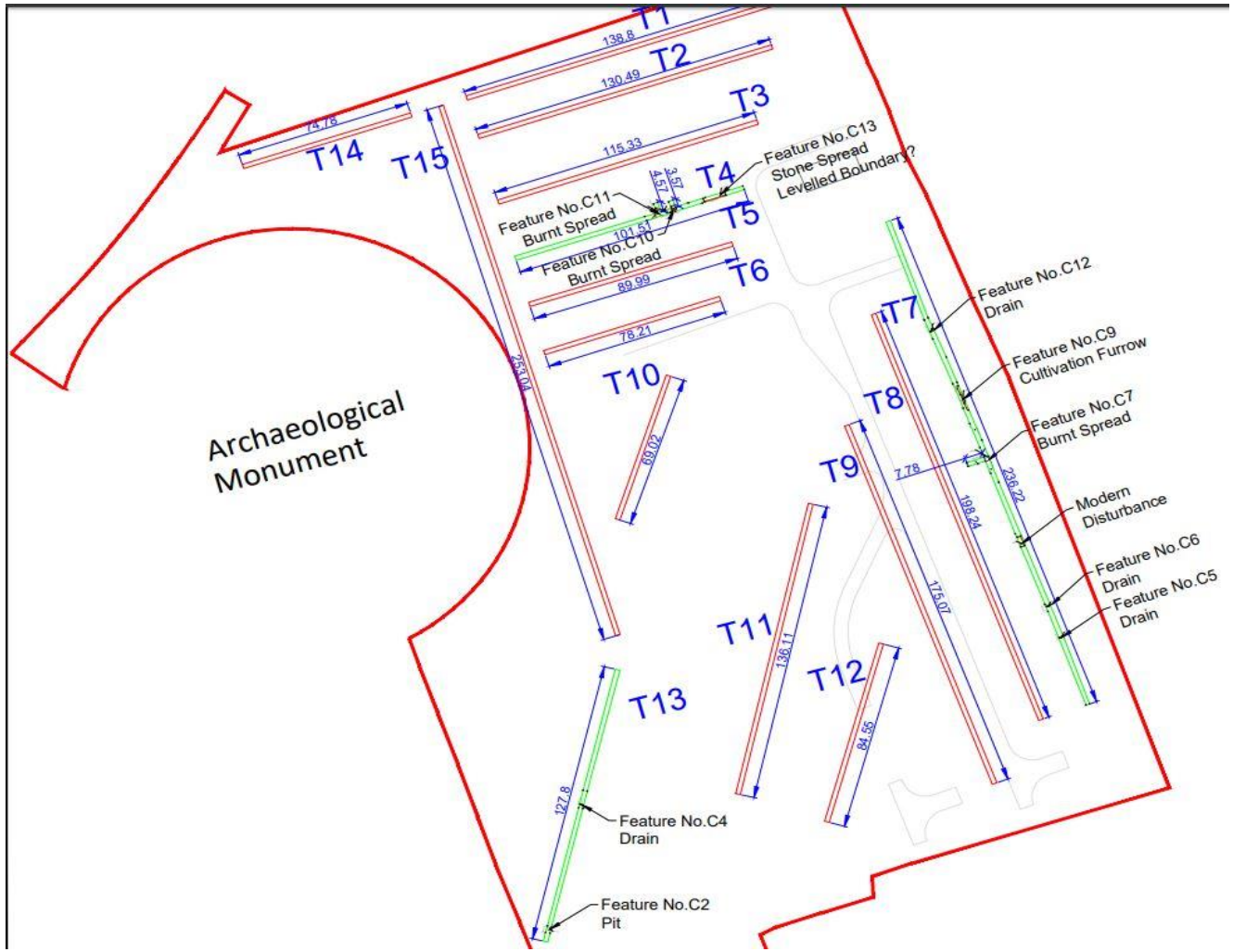

Figure 8: Location of test trenches and potential archaeological features

Two spreads (C10 & C11) of black charcoal enriched soil and burnt stone were identified in the central area of Trench 4 (Plates 1 & 2). A similar type spread was exposed in Trench 7 and all resemble Bronze Age *fulacht fiadh* material. The archaeological impact assessment has recommended that these features be fully excavated prior to the commencement of construction work at the site.

Plate 2: Test Trench 4 – Burnt spread (C11) – looking W

Plate 3: Test Trench 4 – Burnt spread (C10) – looking NNW

Trench 15 was excavated to the immediate east of the buffer zone created around the embanked enclosure located in the northwest corner of the field proposed for development.

Plate 4: Test Trench 15 – looking N towards Irish Cement Works facility

7 STATEMENT OF SIGNIFICANCE

The OCGT power plant site is located in an industrially developed landscape of Drogheda's environs that lie close to the Brú na Bóinne UNESCO World Heritage site. Recent geophysical survey combined with LiDAR imagery has shown that the eastern half of a substantial embanked enclosure (ME027-078) of presumed prehistoric date survives in the north-west corner of the subject lands. This monument is subject to statutory protection. Additionally, three previously unknown sub-surface burnt spreads of potential prehistoric date were exposed during the test excavation undertaken in February 2019. The significance of the site cannot be understated. While no above ground elements of the embanked enclosure (ME027-078) survive, the significance of the monument cannot be understated and its future conservation and management depends on the strict implementation of the mitigation measures outlined in the Archaeological Impact Assessment Report (McCarthy 2019) as well as the Objectives and Actions outlined in this Conservation Plan.

8 MANAGEMENT OBJECTIVES

8.1 Objectives and actions

Objectives for the conservation of the monument are presented here as well as objectives for the future presentation of the archaeological resource to the public.

8.1.1 Objective 1: Protection of the embanked enclosure at pre-construction and construction phases

Preservation *in situ* is the agreed option for the embanked enclosure (ME027-078) detected in the northwest corner of the site scheduled for development. This is in accordance with the Department of Culture, Heritage and the Gaeltacht's publication on 'Framework and Principals for the Protection of the Archaeological Heritage'. While the power plant has been designed to avoid the archaeological monument by establishing a 25m exclusion zone around

its perimeter, the potential for impact during construction is increased due to its levelled nature.

8.1.1.1 Action 1: Temporary Buffer Zone

To ensure no accidental damage or encroachment onto the site of the monument, it is recommended that the temporary buffer zone be established by solid post and rail fencing with clear 'Archaeological Monument Keep Out' signage. An archaeologist should be present to establish the temporary buffer zone around the embanked enclosure in advance of site preparation works. The fencing should be erected prior to the commencement of topsoil removal and should remain in place during the course of construction work. No ground works, stockpiling of topsoil or storage of construction materials and plant equipment should take place within the agreed buffer zone. It is further recommended that an archaeological watching brief be maintained during the construction phase to ensure that the temporary buffer zone remains in place.

8.1.1.2 Action 2: Excavation of archaeological features exposed during the test excavation

The construction phase of any development involves considerable ground disturbance therefore the greatest potential impact of the proposed development at Caulstown on the archaeological resource will be during the removal of topsoil and general ground reduction. The archaeological test excavation identified a small number of potential archaeological features and these should be fully exposed and investigated during the initial phase of topsoil removal at the site. The archaeologist will require an excavation licence for this work to be issued by The National Monuments Service, Department of Culture, Heritage and the Gaeltacht and approved by the National Museum of Ireland.

8.1.1.3 Action 3: Monitoring of topsoil removal

The greatest potential impacts on archaeological heritage will arise during ground works at the initial construction phase as this type of disturbance using heavy plant machinery is inherently destructive to archaeological sites that have no surface expression. All topsoil removal operations required of the development should be fully monitored under licence by a qualified archaeologist. The developer should allow the archaeologist sufficient time, usually four weeks, to obtain an archaeological licence prior to the commencement of construction works.

8.1.1.4 Action 4: Discovery of archaeological features during topsoil removal

Should archaeological features or finds be uncovered during monitoring topsoil removal, the National Monuments Service, DCHG should be notified immediately. Preservation *in situ* or by record may be required.

8.1.2 Objective 2: Protection of the embanked enclosure at post-construction stage

The objectives relating to the future protection and presentation of the embanked enclosure are twofold. The Landscape Plan for the power plant will be designed to define the perimeter of the monument by appropriate planting which will also serve as a means of presenting the significance of the monument to the public.

8.1.2.1 Action 1: Permanent Buffer Zone

A permanent horizontal buffer zone measuring 25m in length should be established around monument (ME027-078) in the northwest corner of the field proposed for development. The Landscape Plan should design a physical buffer zone around the monument that will incorporate the potential original form of the monument. This could be achieved by careful and appropriate landscape planting of trees and hedges.

8.1.2.2 Action 2: Erection of permanent buffer zone

It is proposed that fencing and tree planting will be undertaken outside the buffer zone in an area that will have previously been stripped under archaeological supervision. Should planting and/or fencing extend into areas of virgin ground at the outer edge of the buffer zone, this should be carried out under archaeological supervision.

8.1.3 Objective 3: Presentation of the existence of the embanked enclosure to the public

The archaeology of the site may be presented to the public in the following way.

8.1.3.1 Action 1: Interpretative signage

In order to communicate the significance of the archaeological monument to the local community, it is recommended that interpretative signage be placed in a safe location on the roadside.

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National Monuments Service website http://www.archaeology.ie

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