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generations

## Poolbeg Generating Station IE Licence Review

Electricity Supply Board

### Attachment 4-8-4 Site Condition Report

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## Contents

<b>1</b>	<b>Introduction</b>	<b>4</b>
<b>2</b>	<b>Soil and Groundwater</b>	<b>5</b>
<b>3</b>	<b>Air</b>	<b>7</b>
<b>4</b>	<b>Noise</b>	<b>8</b>
<b>5</b>	<b>Surface Water</b>	<b>9</b>
<b>6</b>	<b>Environmental Designations Adjacent to the Site</b>	<b>10</b>

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# 1 Introduction

The port area of Dublin has a long history of association with power generation. Generating stations have been sited within a 1.5 km stretch of the lower harbour since the early 1900s.

Pigeon House Generating Station located between Pigeon House Harbour and Poolbeg, was originally built by Dublin Corporation and passed to ESB in 1930. It was upgraded in the following years giving it a capacity of 90 MW. It was finally decommissioned in the mid-1970s.

The first development at Poolbeg (formerly known as Pigeon House B) comprised two 120 MW oil fired units, Unit 1 and Unit 2, which were commissioned in 1971/1972. Two 14 MW combustion turbine units for black start capability were also installed. Planning permission was granted in August 1974 for two 250MW oil fired units but only one slightly larger unit of 271MW, Unit 3 was constructed and commissioned in 1978. Following the availability of Natural Gas in the Dublin area, the three units at Poolbeg were converted to firing natural gas or heavy fuel oil in the 1983/84 period. Subsequently the two 14 MW combustion turbines were decommissioned in 1987 and removed.

A 155MW, combustion turbine generator, CG15 for which a full environmental impact assessment was carried out was granted planning permission in 1993 and commissioned in 1994. Government approval was received for the completion of the combined cycle in November 1996. The second gas turbine was installed in 1998 and commissioned. The boilers and steam turbine were commissioned in 1999/2000 and the full CCGT was available for commercial operation in 2000.

The site for Poolbeg Generating Station was reclaimed from the sea during the 1960s. The site of the station includes part of the old Pigeon House Generating Station coal yard.

Poolbeg established a formal Environmental Management System in 1996 which was certified to ISO 14001 in 1999 and has been continually certified to ISO14001 since then.

Poolbeg Generating Station operates in accordance with its Industrial Emissions (IE) Licence No. P0577-03 as amended.

The requirement for this licence review is based primarily on the proposed development of a 75 MWe (megawatts electrical) of flexible thermal generation (“**Poolbeg Flexgen**”) at a site located within the south eastern portion of the overall ESB Poolbeg Generating station and is within the existing EPA licence boundary of Poolbeg Generating Station.

A 75 MW Battery Energy Storage System (“**Poolbeg BESS**”) is also being proposed to be developed at a site located within the western portion of the site at Poolbeg. The proposed BESS is not a scheduled activity, as outlined in the EPA Acts 1992 to 2013.

The purpose of the FlexGen units is to provide additional generating capacity during periods of high demand or when weather conditions means renewable sources cannot meet demand. The BESS does not generate electricity but will store surplus energy generated during low demand periods and release this when demand is greater. Both the FlexGen and BESS are designed to come on stream quickly as demand on the grid changes.

Full details are contained in the following attachment;

- Attachment-1-1-Reason for Licence Review

## Attachment 4-8-4 Site Condition Report

An Environmental Impact Assessment Report (EIAR) has been prepared and submitted with this licence application;

- Attachment-6-3-1- Environmental Impact Assessment Report

The EIAR is a combined EIAR for four ESB projects on the Poolbeg Peninsula, two of which are on the Poolbeg Generating Station site and within the current IE licence boundary.

This report is the Site Condition Report to support the Poolbeg IE Licence Review application process and should also be read in conjunction with the above and with the following attachments:

- Attachment-6-3-2-Natura Impact Statement
- Attachment -4-8-2 Poolbeg BESS and FlexGen SI and GQRA
- Attachment-4-8-3-Poolbeg Baseline Report
- Attachment-7-1-3-1-Emissions Compliance Report
- Attachment-7-1-3-2-Emissions Impact Assessment

## 2 Soil and Groundwater

Details of the site conditions in relation to soil and groundwater for Poolbeg Station are contained within the EIAR undertaken as part of the planning application.

See Attachment-6-3-1 - Environmental Impact Assessment Report, Volume 2: Main Report as follows:

- Chapter 8, Land, Soils and Ground Conditions

And the associated reports in EIAR Volume 3 Appendix 8 refer,

- ESB Proposed BESS and FlexGen Sites, Poolbeg Baseline Assessment.
- ESB Poolbeg BESS and FlexGen SI and GQRA
- ESB Poolbeg FlexGen Hotspot Remedial Excavation and Validation

Two of the associated EIAR Appendix 8 reports mentioned above have been submitted with this application as Attachment-4-8-3-Poolbeg Baseline Assessment and Attachment 4-8-2 Poolbeg BESS and FlexGen SI and GQRA.

The Poolbeg FlexGen Hotspot Remedial Excavation and Validation Report has been submitted previously to the satisfaction of the Agency previously via Eden reference number LR052440.

A brief summary is provided below.

The site is located in an area that is considered to be of moderate sensitivity given the proximity to Dublin Bay and the Lower Liffey Estuary. It is noted that, while the bedrock formation is classified as a locally important aquifer elsewhere in Dublin, it is not classified as an aquifer beneath the site given its coastal setting and the thickness of overlying clays

## Attachment 4-8-4 Site Condition Report

and reclaimed sands and silts. Neither is the reclaimed material considered a granular aquifer.

Groundwater vulnerability beneath the site in the north-western corner is classified as Low. Beneath the remainder of the site the vulnerability is not classified as the underlying sediments and bedrock are not classified as aquifers.

A search of the GSI well database identified one well within a 2 km radius of the site. Given the industrial nature of the area, the accessibility to mains water supply and the brackish / saline shallow groundwater, it is deemed unlikely that groundwater is abstracted for potable use in the vicinity of the site.

The site is located in an industrial area on reclaimed tidal flats. During previous site investigations, groundwater flow was noted to be tidally influenced.

No potential sources of contamination were noted as a result of current site activities during site walkovers conducted in May and November 2019.

A review of the site's chemical inventory identified three relevant hazardous substances which, on the basis of storage and containment infrastructure on site, maintenance and handling procedures it was concluded there was a low risk of losses to ground occurring.

The proposed FlexGen facility will not lead to an increase in the number of hazardous substances stored on site but will increase the volume of Gas oil storage (albeit significantly lower than prior to the most recent technical amendment). It is proposed to install the liquid fuel storage tank and bund in the north-eastern corner of the FlexGen site. The fuel storage on the proposed FlexGen site will be similarly contained, managed and integrity tested as bulk storage on the main Poolbeg site.

The current baseline assessment incorporated additional site investigation that targeted potential historic source areas as well general areal coverage across the site.

Results of this investigation detected two hotspots of contamination within the proposed FlexGen site which have been remediated during 2020. A report on the remediation works has been submitted to the satisfaction of the EPA and is also included within the EIAR appendices.

Assessment of soil and groundwater quality across the remainder of the proposed FlexGen site, the proposed BESS site and the Poolbeg facility as a whole has not identified significant contamination that would pose a risk to human health or controlled water receptors.

### 3 Air

The Station is located in Air Quality Zone A - Dublin. The national EPA report on air quality (Air Quality in Ireland 2018, published in 2019) provides an assessment of air quality in Ireland and in particular, Nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide, particulate matter (both PM<sub>10</sub> and PM<sub>2.5</sub>), volatile organic compounds (VOCs), polyaromatic hydrocarbons (PAHs), heavy metals, carbon monoxide and ozone.

An Air Quality Assessment Report accompanies this application in the EIAR. The following EIAR chapter and Air Quality Assessment are relevant in relation to Air Emissions.

Attachment 6-3-1 - Environmental Impact Assessment Report Volume 2 – Main Report, as follows;

- Chapter 13 Air Quality and Climate

Attachment 6-3-1 - Environmental Impact Assessment Report, Volume 3 – Appendices, as follows;

- Appendix 13 ESB FlexGen Air Quality Assessment

There is one new proposed emission source relating to air emissions from the site, that from the Poolbeg FlexGen stack. The Air Quality assessment modelled a number of scenarios for the Poolbeg site to include; the existing Poolbeg CCGT, Poolbeg FlexGen conservative operational scenario and worst-case gas scenario and worst gas diesel scenario as detailed in the assessment. The conclusion of the Air Quality Assessment Report for Poolbeg FlexGen notes that the modelling results demonstrate that ambient pollutant concentrations (including background) beyond the site ownership boundary are well below the applicable ambient air quality limit values at all off-site receptors modelled for all scenarios assessed.

A cumulative scenario was also modelled for the worst-case pollutant (NO<sub>2</sub>) as Poolbeg Power Station, the proposed Poolbeg FlexGen, and Dublin Waste-to-Energy facility are located in close proximity to both the Dublin Bay Power Plant and the proposed Ringsend FlexGen. The modelling results for the cumulative scenario demonstrate that ambient NO<sub>2</sub> concentrations (including background) beyond the site ownership boundaries are well below the applicable ambient air quality standards/limit values at all off-site receptors modelled.

The following attachments are also relevant

- Section 4.7 of this application - Best Available Technology
- Attachment -7-4-1- Air Emissions

The annual emissions of the licenced pollutants are reported in Poolbeg Stations Annual Environmental Report (AER), see Table 1 for a summary of the boiler stack emission (i.e. the main air emission point from the plant) in tonnes per annum.

The existing CCGT station has adhered to licence emission limits to air during the period 2017 - 2019. Three minor incidents relating to air have been reported during the period 2017-2019. All three incidents related to monitoring equipment functioning and not breaches of Emission Limit Values (ELVs). These incidents were resolved promptly, and reoccurrence

is considered to be low. Continuous monitoring of stack emissions is in place and allows early detection of any equipment failure.

**Table 1 Annual Emissions to Air for 2019 as detailed in the AER for the station**

Emission Point Ref No.	Location	Parameter	Annual emission tonnes (2019)
CT 14 (A1-5, A1-7)	Stack	Nitrogen oxides (NOx/ NO2)	150.02
		Carbon Monoxide	27.19
CT 15 (A1-6, A1-8)	Stack	Nitrogen oxides (NOx/ NO2)	55.55
		Carbon Monoxide	11.87

The Poolbeg Station also operates in accordance with its Greenhouse Gas Emission (GHG) permit No. IE-GHG160-10425-2. The total amount of reportable emissions of CO<sub>2</sub> in 2019 was 311,969 tonnes.

See Attachment-7-1-3-1- AER 2017-2019 – Air Summary.

## 4 Noise

There are emission limits in relation to noise set out in the IE licence. However, monitoring was discontinued at the NSLs on agreement with the Agency in 2011. (Correspondence P0577-02/AP03MG, dated 28/04/11). This was due to the difficulty to obtain credible noise readings as dominant noise at the NSLs is due to traffic, port activity and various other local industrial activity. Noise Monitoring at the site boundary took place in 2014 and again 2018. The site is compliant with noise limits.

A noise impact assessment has been carried out in line with guidance provided in *Guidance Note for Noise: License Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)* as published by the Environmental Protection Agency's Office of Environmental Enforcement.

Potential noise impacts from the proposed Poolbeg FlexGen and BESS are considered separately and in combination with the other FlexGen (Ringsend FlexGen) and BESS (South Wall BESS) projects proposed for the Poolbeg Peninsula. An assessment of cumulative noise impacts from the other industrial developments close-by are also considered. These include Dublin Bay Power, the Covanta Dublin Waste to Energy facility and Ringsend Wastewater Treatment Plant.

The operational noise impacts of Poolbeg FlexGen and BESS when considered individually demonstrated that the predicted noise levels at the representative noise receptors in Dublin Bay area due to the proposed developments are below the lowest criterion given in the NG4 guidance of 45 dB(A) Leq for the night-time. The noise levels are therefore also below the criteria for daytime and evening of 55 dB(A) Leq and 50 dB(A) Leq respectively. The predicted noise levels are also more than 10 dB below the baseline noise levels measured in 2016, 2018 and 2019. This indicates that predicted operational noise from either the FlexGen plant or BESS will not contribute to an increase in prevailing noise as they are

sufficiently below the baseline. Therefore, there is no potential significant adverse effect due to operational noise from Poolbeg FlexGen or BESS.

The predicted operational noise at the representative noise receptors due to the four project elements (The proposed developments of two FlexGen and two BESS plants on the Poolbeg Peninsula) shows the combined predicted noise level does not exceed the night-time criteria of 45 dB(A).

Cumulative impacts of predicted operational noise from the four proposed project elements and the three individual operating licensed sites in the area were considered and the predicted noise levels at the representative noise receptors show that the combined level does not exceed the night-time criterion of 45 dB(A).

The modelling assessment indicates that the noise contribution from Poolbeg CCGT and the proposed FlexGen and BESS will meet the limits set out in NG4, and no mitigation will be required. Consideration should be noted in relation to its location and the cumulative noise impacts from other industrial activities, port activities and traffic in close proximity to this site.

## 5 Surface Water

The water regions that are in the vicinity of Poolbeg Station are detailed in Table 2.

**Table 2 Water regions that are in the vicinity of the Poolbeg Station site**

Water Region	Poolbeg Station
Hydrometric Area	09
Catchment	Liffey and Dublin Bay (09)
Sub Catchment	Dodder_SC_010 (09_16)
River Sub Basin	Dodder_050
WFD Waterbody	Dodder_050
Transitional Waterbody	Liffey Estuary Lower
Coastal Waterbody	Dublin Bay

The Liffey and Dublin Bay catchment (09) covers an area of 1,616km<sup>2</sup> and is characterised by a sparsely populated, upland south eastern area underlain by granites and a densely populated, flat, low lying limestone area over the remainder of the catchment basin. The Dodder sub catchment (09\_16) has an area of 167.77km<sup>2</sup> with much of the sub catchment being made up of densely populated urban area. The WFD status of the waterbodies is detailed as follows;

Waterbody	WB Code	Type	Ecological Status
<b>River Dodder (Dodder_050)</b>	IE_EA_09D010900	River	Moderate
<b>Liffey Estuary Lower</b>	IE_EA_090_0300	Transitional	Good
<b>Dublin Bay Lower</b>	IE_EA_090_0000	Coastal	Good

The station has adhered to licence emission limits to surface water during the period 2017 - 2019, there was no reported incidents during this period in relation to surface water. During the same period there was one breach of a storm water trigger level.

- See Attachment-7-1-3-1-Emissions Compliance Report

There are three new surface water emission points proposed in this licence review, see attachments

- Attachment 7-2 - Emissions to Surface Water
- Attachment 7-1-3-2 Emissions impact Assessment

## 6 Environmental Designations Adjacent to the Site

There are several European and nationally designated sites in proximity, these include;

- South Dublin Bay and River Tolka Estuary (SPA) (site code: 004024);
- South Dublin Bay (SAC) (000210);
- South Dublin Bay (proposed NHA) (000210);
- North Bull Island (SPA) (00406);
- North Dublin Bay (SAC) (000206);
- Lambay Island SAC
- Rockabill to Dalkey Island SAC
- Dalkey Island SPA (004172)
- Irelands Eye SPA (004117)
- Baldoyle Bay SPA (004016)
- Grand Canal (proposed NHA) (002104);
- Royal Canal (proposed NHA) (002103).
- Dolphins Dublin Docks (proposed NHA (000201)
- North Dublin Bay (proposed NHA) (000206)

More details of the Biodiversity in relation to the station are contained within the following attachments:

- Attachment-6-3-1- Environmental Impact Assessment Report, Main Report, as follows;
  - Chapter 7 Biodiversity
- Attachment-6-3-2 – Natura Impact Statement