KEADBY
NEXT GENERATION
POWER STATION
Hydrogen-enabled flexible power

A collaboration between SSE Thermal and Equinor

The Keadby Next Generation Power Station Project

Document Ref: 6.3

Planning Inspectorate Ref: EN0110001

The Keadby Next Generation Power Station Development Consent Order [year]

Environmental Statement (ES)

Volume II – Appendix 9B Operational Noise Information

The Planning Act 2008

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

Applicant: Keadby Next Generation Limited

Date: August 2025

Version: V0

ARUP DWD AECOM

Document History

Document Ref	6.3.7 / Appendix 9B
Issue	V0
Document Owner	Arup

Glossary

Abbreviation/	Description
CCS	Carbon Capture and Storage
dB	Decibel
ES	Environmental Statement
ISO	International Organization for Standardization
OEM	Original Equipment Manufacturer
OS	Ordnance Survey

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9B. Operational Noise Information

9B.1. Noise model Settings

9B.1.1. A 3D model of the Proposed Development was constructed in SoundPlan (Version 9.1) acoustic modelling software. This software implements the sound propagation calculation methodology set out in ISO 9613-2:2024: Attenuation of Sound during Propagation Outdoors.

9B.2. Data sources for the Proposed Development

Table 9B.1: Modelling Input Data

Model element	Data package	Format	Source file	Received from	Received data date
Digital terrain map (converted to contours)	Keadby 3 Power Station ES	.cna	Keadby 3 Power Station ES - Cadnaa noise model files	AECOM	26 Jul 2024
Topography; Building heights; and Ground absorption	Keadby 3 Power Station ES and OS Open Data	.cna	Keadby 3 Power Station ES - Cadnaa noise model files	AECOM	26 Jul 2024
Site building dimensions	Scheme designs	.pdf	Various files	Project Team	Updated throughout project
Sound source data	Keadby 3 Power Station ES and provided by design team	.pdf / e-mail	Various files	Project Team	Updated throughout project
Sound source data	OEM Information	.pdf/ e-mail	Typical Plant Layout 100% Hydrogen Reference Plant	Siemens Energy via SSE Thermal	03 Feb 2025

9B.3. Modelling Assumptions

9B.3.1. The model was configured with the following specifications:

- Maximum number of reflections: 3;
- Maximum source to receiver distance: 5 km;
- Areas of ground absorption were determined from OS Open Data information. Areas that are not water were assumed to be acoustically soft while areas of water were assumed to be acoustically hard.
- Receivers were positioned at 1.5 m from ground for 1 storey buildings, 4 m from the ground for 2 storey buildings and an additional 2.5 m per additional storey.
- Sound emission data for key sound emitting plant/buildings have been sourced from the Keadby CCS Power Station ES Report and OEM information provided by SSE Thermal. In the absence of detailed information about sound sources, sound power levels / sound pressure levels of similar plant from other projects have been used.
- Internal reverberant sound pressure levels provided have been converted to sound power level per m^2 assuming a wall sound reduction of Rw 25.

Table 9B.2: Sound Power Levels

Source	Linear sound power levels each frequency band (dB)									Number in model	L_{WA} (dB)
	31	63	125	250	500	1k	2k	4k	8k		
Natural Gas AGI	-	89	88	86	86	88	92	91	87	1	97
Hydrogen Gas AGI	-	89	88	86	86	88	92	91	87	1	97
Blending Skid	-	89	88	86	86	88	92	91	87	1	97
Gas Turbine Hall*	114	90	71	41	24	24	3	0	0	1	75
Gas Turbine Gen Hall*	92	90	78	54	21	21	5	0	0	1	66
Gas Turbine Air Intakes	-	89	88	86	86	88	92	91	87	1	97
HRSG Building*	131	89	66	43	27	23	6	0	0	1	91
HRSG Aux Building*	-	89	90	92	92	95	92	88	82	1	99
HRSG Stack	-	89	88	86	86	88	92	91	87	1	97
Steam Turbine Hall*	122	89	70	40	23	23	2	0	0	1	82
Steam Turbine Aux Building*	105	90	71	41	24	24	3	0	0	1	68
Transformer Yard	114	125	125	112	90	84	71	51	50	1	110
Hydrous Ammonia Storage and Transfer	-	61	62	64	64	67	64	60	54	1	71
Water Tower Cooler	116	111	114	109	96	88	93	93	89	8	104
Cooling Water Pumps	107	111	110	99	88	81	79	77	74	1	97
Boiler Feed Water Chem Package	-	63	64	66	66	69	66	62	56	1	72
Demineralised Water Storage Plant	-	89	90	92	92	95	92	88	82	1	99
Demineralised Water Storage Pump	-	89	90	92	92	95	92	88	82	1	99
Water Treatment Building	104	108	94	71	52	38	31	21	18	1	83
Raw Water Storage Tank	93	97	99	89	81	75	75	67	60	1	87
Water Abstraction Station	-	89	90	92	92	95	92	88	82	1	99
Emergency Generator	-	94	95	95	95	93	91	88	83	1	99
**Sound power level is given as sound power per m^2*											

9B.4. Uncertainty

9B.4.1. Any predictions of sound levels have an associated degree of uncertainty. Modelling and measurement processes have been carried out in such a way to reduce such uncertainty. In particular, the following sources of uncertainty have been noted:

- Sound emission data for key sound emitting plant and buildings within the Proposed Development have been based on data provided in the Keadby CCS Power Station ES Report and the OEM data provided by SSE Thermal. This data is assumed to be representative of the Proposed Development, although the precise methodology by which these data were gathered by third parties, and hence the uncertainties, is not known at the current stage of design;
- Predictions of sound pressure levels according to ISO 9613 are based on an assumption of moderate downwind propagation, and hence could be considered as a reasonable worst-case calculation. However, the standard also indicates an estimated accuracy of ±3 dB(A) in predicted levels.