

APPENDIX A8-2

Sensitivity Analysis

Shannon LNG Limited
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Shannon Technology and Energy Park
Environmental Impact Assessment Report

Appendix A8-2 – Sensitivity Analysis

A model sensitivity analysis has been undertaken of various model inputs. The analysis focuses on the Normal Operational Scenario and quantifies the variance in model outputs to long-term (annual mean) and short-term (hourly mean) contributions, after the alteration to the following model parameters at the worst affected receptor (R19):

- Meteorological Data;
- Building downwash module;
- Terrain module; and
- Variable Surface Roughness file.

The results of the sensitivity analysis are provided in Table A8-2.1 and Table A8-2.2. The tables present a comparison of outputs relating to parameter alterations against the inputs used to inform the main assessment.

Table A8-2.1: Model Sensitivity Analysis – Meteorological Data

	Meteorological Data				
	2016	2017	2018	2019	2020
Long-term Contribution	93%	75%	96%	86%	100%
Short-term Contribution	100%	99%	100%	95%	99%

Table A8-2.2: Model Sensitivity Analysis – Building, Terrain and Surface Roughness

	Input Parameters				
	As Modelled	No Buildings	No Terrain	No Variable Surface Roughness ¹	No Buildings, Terrain or Variable Surface Roughness ¹
Long-term Contribution	100%	57%	98%	104%	56%
Short-term Contribution	100%	54%	100%	100%	60%

¹ Alternative to variable surface roughness file is to assume a surface roughness of 0.2 m across the study area.

Table A8-2.1 demonstrates that a change in meteorological data affects long-term (annual mean) contributions to a larger extent than short-term (hourly mean) contributions. For long-term, 2020 is notably the worst year at the worst affected receptor, with 2016 seeing the lowest reduction (-7%) and 2017 the greatest (-25%). For short-term, 2016 is marginally the worst year at the worst affected receptors, with 2018 seeing the lowest reduction (<-1%) and 2019 the greatest (-5%).

Table A8-2.2 demonstrates that omitting the building downwash module from the modelling reduces concentrations significantly at the worst affected receptor for both long-term and short-term averaging periods (-43% and -46% respectively). Removing terrain reduces the long-term contribution by a small amount (-2%) and short-term contribution by a marginal amount (<-1%). Removing the variable surface roughness file increases the long-term contribution by a small amount (+4%) and short-term contribution by a marginal amount (<+1%). Removing all of the parameters referred to above reduces long-term and short-term contributions by -44% and -40% respectively.