Rampion 2 Wind Farm

Category 8: Examination Documents

Air Quality Mitigation Strategy

Date: April 2024
Revision A

Application Reference: 8.59
Pursuant to: The Infrastructure Planning (Examination Procedure) Rules 2010, Rule 8(1)(c)
Ecodoc Reference: 005165251-01

Document revisions

Revision	Date	Status/reason for issue	Author	Checked by	Approved by
A	25/04/2024	For Deadline 3 submission	WSP	RED	RED

Contents

1. Introduction

1.1.1 This Appendix presents an Air Emissions Mitigation Strategy (AEMS) for the Rampion 2 project.

1.1.2 Rampion 2's first Statutory Consultation exercise under Section 42 of the Planning Act 2008 ('formal consultation') ran from 14 July to 16 September 2021, a period of nine weeks. The PEIR was published as part of the first Statutory Consultation which provided preliminary information on air quality within Chapter 20 of the Preliminary Environmental Information Report (PEIR) (Rampion Extension Development (RED), 2021). During this formal consultation period the following comment was received from Horsham District Council (HDC):

"…..Although Air Quality and Emissions Mitigation Guidance for Sussex (2021) guidance was written in the context of operational impacts it de facto applies to impacts lasting a number of years. As such it still applies to construction activities that take a number of years to complete. It is stated in the PEIR that the duration of the construction phase for cable installation may take up to three years, although – as confirmed by the consultants – construction activities at any given location will be of fairly short duration as the contractors work their way along the route. It would be helpful, if possible, at ES stage to clarify the duration of the installation activities taking place along the A272 between the A23 and A24"

1.1.3 The AEMS provided in this report addresses the HDC comment by reviewing baseline air quality conditions in the area in which the proposed Development Consent Order (DCO) Order Limits; and available guidance documents in order to identify suitable mitigation options to reduce potential air quality impacts associated with the Proposed Development. The AEMS has also considered detailed feedback from HDC[1] on the appropriate methodology.

1.1.4 The policy focussed mitigation measures outlined within this AEMS are both proportionate to the damage cost calculated and in line with the measures outlined in the '*Air quality and emissions mitigation guidance or Sussex*' (Mid Sussex District Council (MSDC, 2021) published by a consortium of local authorities in Sussex. Specifically, the AEMS has considered the relevant measures in the West Sussex Transport Plan (West Sussex County Council (WSCC), 2022) and the HDC (2023), MSDC (2023), Worthing Borough Council (WBC) (Adur and Worthing Councils, 2023) and Arun District Council (ADC) (2023) latest Local Air Quality Management (LAQM) Annual Status Reports (ASR).

[1] HDC, 2023, E-mail from Matthew Porter, Senior Planning Officer, dated 10 July 2023.

2. Methodology

2.1 Overview

2.1.1 The methodology undertaken for compiling the AEMS, adapts the approach detailed in Sussex (MSDC, 2021) technical planning guidance and includes the following:

- Traffic data (**Section 2.2**): review the traffic data and duration of the construction schedule to define the Proposed Development classification that will inform the type of mitigation measure applicable;
- Damage Costs (**Section 3**): undertake a damage cost calculation using the Government's Interdepartmental Group on Costs and Benefits (IGCB) (Department for Environment, Food and Rural Affairs (Defra), 2023a) damage cost approach and the Sussex guidance (MSDC, 2021) technical guidance to determine the level of financial contribution that should be spent on mitigation to offset the air quality impact of the Proposed Development; and
- Policy measures review (**Section 4**): review of HDC (2023), WBC (Adur and Worthing Borough Councils, 2023), MSDC (2023) and ADC (2023) latest air quality reports and the West Sussex Transport Plan (WSCC, 2022) to identify any measures, which could be implemented and/or funded to reduce or offset the effects of the Proposed Development on air quality (if further measures are required).

2.2 Traffic data review

2.2.1 **Chapter 32: ES Addendum, Volume 2** of the ES **[REP1-006]** was submitted at Deadline 1 which outlines the additional assessments completed since submission of the Development Consent Order (DCO) Application to complement the **Chapter 23: Transport, Volume 2** of the ES **[APP-064]**. **Chapter 32: ES Addendum, Volume 2** of the ES **[REP1-006]** also presents an updated assessment of the likely significant air quality effects of construction traffic emissions expected from Rampion 2 in light of the new traffic data produced.

2.2.2 The average weekly data utilised within **Chapter 32: ES Addendum, Volume 2** of the ES **[REP1-006]** has been converted to 24 hr flows by assuming a 7-day week. This ensures that damage cost are calculated based on the Annual Average Daily Traffic (AADT) anticipate in each Local Authority.

3. Damage Costs

3.1 Calculations

3.1.1 This document reports the damage costs associated with emissions from traffic expected as a result of the Proposed Development. Emissions of NO_x and $PM_{2.5}$ were estimated from Department for Environment, Food and Rural Affairs (Defra's) (2023b) Emission Factor Toolkit (EfT) using Annual Average Daily Traffic (AADTs) from the Proposed Development. The damage cost calculations have considered AADTs within each local authority where traffic from the Proposed Development is expected to result. Using UK Government's online guidance (Defra, 2023a), an appropriate damage cost for each pollutant was selected.

3.2 Calculation of the change in emissions

3.2.1 As discussed, Defra's (2023b) EfT has been used to calculate the emissions of NO_x and $PM_{2.5}$ from AADTs from traffic associated with the Proposed Development. The traffic associated with the Proposed Development considered consists of construction traffic, therefore an average distance travelled of 10km was applied. An average speed of 50kph was input following the guidance published by Sussex-air air quality partnership (Sussex-air air quality partnership, 2021).

3.2.2 **Table 3-1** reports the change in pollutant emissions across the construction phase of the Proposed Development expected within the administrative area of each local authority.

Table 3-1 Change in emissions of NO_x and $PM_{2.5}$

Year	NOx emission increase (tonnes)	PM2.5 emission increase (tonnes)
Horsham District		
2026	0.05	0.01
2027	0.63	0.09
2028	0.33	0.06
2029	0.06	0.01
Arun District		
2026	0.13	0.02
2027	0.72	0.11

Year	NOx emission increase (tonnes)	PM2.5 emission increase (tonnes)
2028	0.20	0.03
2029	0.10	0.02
Worthing Borough		
2026	0.07	0.01
2027	0.43	0.06
2028	0.15	0.02
2029	0.07	0.01
Mid Sussex District		
2026	0.01	0.002
2027	0.22	0.032
2028	0.12	0.020
2029	0.02	0.004

Damage cost calculation

3.2.3 The central road transport average damage costs were calculated for each local authority and are presented in **Table 3-2** to **Table 3-9.** This is consistent with the worked example included in the Sussex 2021 guidance (Sussex-air Air Quality Partnership, 2021) and feedback from HDC[1]. The IGCB (Defra, 2021a) published damage cost rates in a tiered approach with a low, central and high damage cost. The AEMS, as detailed above, is using the central road transport average damage cost rate; however, for reference **Table 3-10** presents costs using all three tiers.

3.2.4 Following the prescribed approach defined in the UK Government's online guidance (Defra, 2023a), the damage costs were rebased from the price base year of 2022 to the assessment years considered (i.e. 2026-2029) taking into account inflation. The total cost were then calculated by multiplying the rebased damage costs by the estimated emission increases of each pollutant within each local authority. A discount factor was calculated using the equation below, following the stepped approach prescribed in the UK Government's online guidance (Defra, 2023a):

$$Discount\ factor = 1/(1 + 0.015)t$$

t =The number of years into the future that value is from the base year (2026)

3.2.5 The total costs were multiplied by the discount factors to obtain a discounted cost. **Table 3-2** to **Table 3-9** reports the central damage cost calculations for each local

authority. A final summary table is then provided where the overall total damage costs (including the central, high sensitivity and low sensitivity damage costs) are reported in **Table 3-10**.

3.2.6 As outlined in **Table 3-10**, the overall central damage cost calculated is **£68,611**.

Table 3-2 Central NO_x damage cost calculations – Horsham District

Year	NO_x increase (tonnes)	NO_x damage costs	Damage costs rebased to 2022	Total cost	Discount factor	Total discounted value
2026	0.05	£11,682	£10,328	£493	1.000	£493
2027	0.63	£11,682	£10,328	£6,497	0.985	£6,401
2028	0.33	£11,682	£10,328	£3,425	0.971	£3,324
2029	0.06	£11,682	£10,328	£596	0.956	£570
Total	**1.07**			**£11,010**		**£10,788**

Table 3-3 Central $PM_{2.5}$ damage cost calculations – Horsham District

Year	$PM_{2.5}$ increase (tonnes)	$PM_{2.5}$ damage costs	Damage costs rebased to 2022	Total cost	Discount factor	Total discounted value
2026	0.01	£84,548	£74,750	£461	1.000	£461
2027	0.09	£84,548	£74,750	£7,075	0.985	£6,970
2028	0.06	£84,548	£74,750	£4,272	0.971	£4,147
2029	0.01	£84,548	£74,750	£839	0.956	£802
Total	**0.17**			**£12,647**		**£12,381**

Table 3-4 Central NO_x damage cost calculations – Arun District

Year	NO_x increase (tonnes)	NO_x damage costs	Damage costs rebased to 2022	Total cost	Discount factor	Total discounted value
2026	0.13	£11,682	£9,802	£1,305	1.000	£1,305
2027	0.72	£11,682	£9,802	£7,083	0.985	£6,979
2028	0.20	£11,682	£9,802	£1,936	0.971	£1,879
2029	0.10	£11,682	£9,802	£976	0.956	£933
Total	**1.15**			**£11,300**		**£11,096**

Table 3-5 Central $PM_{2.5}$ damage cost calculations – Arun District

Year	$PM_{2.5}$ increase (tonnes)	$PM_{2.5}$ damage costs	Damage costs rebased to 2022	Total cost	Discount factor	Total discounted value
2026	0.02	£84,548	£70,942	£1,209	1.000	£1,209
2027	0.11	£84,548	£70,942	£7,609	0.985	£7,497
2028	0.03	£84,548	£70,942	£2,371	0.971	£2,302
2029	0.02	£84,548	£70,942	£1,365	0.956	£1,306
Total	**0.18**			**£12,555**		**£12,314**

Table 3-6 Central NO_x damage cost calculations – Worthing Borough

Year	NO_x increase (tonnes)	NO_x damage costs	Damage costs rebased to 2022	Total cost	Discount factor	Total discounted value
2026	0.07	£11,682	£9,802	£679	1.000	£679
2027	0.43	£11,682	£9,802	£4,200	0.985	£4,138
2028	0.15	£11,682	£9,802	£1,422	0.971	£1,380
2029	0.07	£11,682	£9,802	£692	0.956	£662
Total	**0.71**			**£6,994**		**£6,860**

Table 3-7 Central $PM_{2.5}$ damage cost calculations – Worthing Borough

Year	$PM_{2.5}$ increase (tonnes)	$PM_{2.5}$ damage costs	Damage costs rebased to 2022	Total cost	Discount factor	Total discounted value
2026	0.01	£84,548	£70,942	£624	1.000	£624
2027	0.06	£84,548	£70,942	£4,473	0.985	£4,407
2028	0.02	£84,548	£70,942	£1,739	0.971	£1,688
2029	0.01	£84,548	£70,942	£959	0.956	£917
Total	**0.11**			**£7,796**		**£7,637**

Table 3-8 Central NO_x damage cost calculations – Mid Sussex District

Year	NO_x increase (tonnes)	NO_x damage costs	Damage costs rebased to 2022	Total cost	Discount factor	Total discounted value
2026	0.01	£11,682	£9,802	£143	1.000	£143
2027	0.22	£11,682	£9,802	£2,115	0.985	£2,084
2028	0.12	£11,682	£9,802	£1,149	0.971	£1,116
2029	0.02	£11,682	£9,802	£192	0.956	£184
Total	**0.37**			**£3,600**		**£3,526**

Table 3-9 Central $PM_{2.5}$ damage cost calculations – Mid Sussex District

Year	$PM_{2.5}$ increase (tonnes)	$PM_{2.5}$ damage costs	Damage costs rebased to 2022	Total cost	Discount factor	Total discounted value
2026	0.002	£84,548	£70,942	£132	1.000	£132
2027	0.032	£84,548	£70,942	£2,279	0.985	£2,245
2028	0.020	£84,548	£70,942	£1,419	0.971	£1,377
2029	0.004	£84,548	£70,942	£268	0.956	£256
Total	**0.06**			**£4,098**		**£4,011**

Table 3-10 Overall damage costs

Local Authority	Total central damage cost
Horsham District	£23,169
Arun District	£23,409
Worthing Borough	£14,496
Mid Sussex District	£7,537
TOTAL	**£68,611**

4. Policy measures

4.1.1 The LAQM ASRs indicates a lack of availability and resources to fund Air Quality Action Plan (AQAP) measures as a barrier to implementation. The calculated damage cost could therefore be used to offset air emissions by supporting selected Defra funded measures described in the West Sussex Transport Plan (WSCC, 2022) and LAQM ASRs for the relevant Councils. The measures are summarised as follows:

4.2 Horsham District Council

- Continuation and expansion of the monitoring programme, to include monitoring for particulate matter;
- delivery of the HDC's vehicle replacement programme;
- expansion of Electric Vehicle Network;
- introduction of on-street electric vehicle charging infrastructure in Horsham; and
- prioritise active travel modes where development takes place and deliver priority cycle routes such as the Horsham to Crawley cycle 75 route.

4.3 Mid-Sussex District Council

- The Sayers Common to Hassocks Cycle Route has been approved by WSCC and it is hoped that several sections will be completed by the end of 2023. Design work on other sections will commence at the same time.
- Optimize traffic signalling to intelligently respond to pollutant monitoring data at the Stonepound crossroads.
- WSCC has adopted the West Sussex Electric Vehicle Strategy 2019-2030. Connected Kerb is fully funding EV charging point deployment working with West Sussex County Council, Adur and Worthing, Arun, Crawley, Horsham, MSDC and borough councils.

4.4 Worthing Borough Council

- Working with Sussex-air partners to supplement Defra funded projects (schools/communities and taxi engagement);
- progressing a review of the 2015 Worthing Air Quality Action Plan (WBC, 2015) including a new source apportionment study; and
- working with West Sussex County Council on the Connected Kerb EV charge point project.

4.5 Arun District Council

- The Council's vehicle fleet is currently made up of 18 vehicles, 16 of these are expected to be EV. It is expected that the two remaining vehicles will be replaced with EV, if and when they are able to provide the load capacity required at a responsible cost.
- Continuing participation in, and funding for, the Sussex Air Quality Network which includes seven permanent automatic particulate monitoring sites measuring both PM_{10} and $PM_{2.5}$. Currently, none of which are in the district.

5. Conclusions

5.1.1 The Rampion 2 project will incur damage costs associated with air emissions from construction traffic. Based on estimates of emissions of air pollutants NO_x and $PM_{2,5}$, the central road transport average damage costs have been calculated for HDC, MSDC, WBC and ADC following Defra (2023a) guidance. The calculation methodology is consistent with the Air quality and emissions mitigation guidance published by a consortium of local authorities in Sussex (Sussex-air Air Quality Partnership, 2021).

5.1.2 The total damage cost calculated is £68,611 of which the majority will be incurred in the Horsham and Arun Districts. Mid-Sussex and Worthing Councils are also subject to damage costs.

5.1.3 As there is a general lack of availability and resources to fund AQAP measures, the damage costs could be used to promote the aims of Sussex Council AQAPs through the provision of funding. This AEMS provides a summary of potential projects which are not currently subject to Defra funding which could be selected to offset air emissions from the project in conjunction with the District and Borough councils.

6. Glossary of terms and abbreviations

Table 6-1 Glossary of terms and abbreviations

Term (acronym)	Definition
AEMS	Air Emissions Mitigation Strategy
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area. If a Local Authority identifies any locations within its boundaries where the Air Quality Objectives are not likely to be achieved, it must declare the area as an AQMA. The area may encompass just one or two streets, or it could be much bigger. The Local Authority is subsequently required to put together a plan to improve air quality in that area — a Local Air Quality Action Plan.
AQO	Air Quality Objective. The Air Quality Objectives are policy targets generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances, within a specified timescale. The Objectives are set out in the UK Government's Air Quality Strategy for the key air pollutants.
Construction	Used both to refer to the whole construction phase of a project, and more specifically to refer to an activity involved in the provision of a new structure (building, road, etc.).
HDC	Horsham District Council
IAQM	Institute of Air Quality Management.
NO_x	Nitrogen oxides
NO_2	Nitrogen dioxide.
PC	Process contribution.
PEC	Predicted environmental contribution.
Preliminary Environmental Information Report (PEIR)	The written output of the preliminary environmental assessments as required under the Infrastructure Planning 'Environmental Impact Assessment' Regulations 2017. It is developed to support public statutory consultation and presents the preliminary findings of the assessment to allow an informed view to be developed of the Proposed Development, the assessment approach that has been undertaken, draw preliminary conclusions on the likely significant

Term (acronym)	Definition
	effects of the Proposed Development and environmental measures proposed
PM	Particulate matter. Microscopic portions of solid matter suspended in air. This includes a wide range of particle sizes and different chemical constituents. It consists of both primary components, which are emitted directly into the atmosphere, and secondary components, which are formed within the atmosphere as a result of chemical reactions. Commonly used to refer to both PM_{10} and $PM_{2.5}$.
PM_{10}	Particulate matter smaller than 10 µm in diameter.
$PM_{2.5}$	Particulate matter smaller than 2.5 µm in diameter.
Proposed Development	The development that is subject to the application for development consent, as described in **Chapter 4: The Proposed Development, Volume 2** of the ES **[APP-045]**.
Receptor	These are as defined in Regulation 5(2) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and include population and human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage and landscape that may be at risk from exposure to pollutants which could potentially arise as a result of the Proposed Development.

7. References

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