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Applicant's Post Hearing Notes - Appendix 4 Air Quality Clean Air Zone Sensitivity Testing Technical Note

The Planning Act 2008

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CONTENTS

TABLES

1. INTRODUCTION

1.1.1.1. This Technical Note has been prepared following discussions held during Issue Specific Hearing 5 (ISH 5) on Environmental Matters and Highways that was held on 18 February 2021. The written transcript of the hearing (EV-085 to 89) is available from the Planning Inspectorate's website as well as the Applicant's Summary of the Oral Case at ISH5 (AS-067).

1.1.1.2. During the course of discussions of Agenda Item 8 relating to air quality, Portsmouth City Council (PCC) raised concerns as the predicted magnitude of increases in NO_2 concentrations made by the Applicant in Appendix 5 of the Environmental Statement (ES) Addendum - Clean Air Zone (CAZ) Sensitivity Testing assessment (REP7-072) at locations of exceedance or near exceedance identified in the PCC 2019 Air Quality Local Plan (Portsmouth City Council, 2019). These concerns are also documented in submissions by PCC at Deadline 7c (REP7c-020).

1.1.1.3. PCC considered that some of the predicted concentrations of NO_2 were of an unacceptable magnitude based on the modelling that informed the 2019 Air Quality Action Plan. This modelling provided an indication of the headroom above the predicted NO_2 concentration before the limit value of 40 µg/m³ might be exceeded and by inference Ministerial Order (Department for Environment Food and Rural Affairs, 2018) will not be met. PCC were concerned that some of the predicted changes in the in the CAZ Sensitivity Testing assessment (REP7-072) were in excess of this headroom figure.

1.2. CONSERVATISM

1.2.1.1. Conservative approaches are used in the environmental assessment to ensure that environmental values, such as are quality, are maintained and enhanced to promote sustainable development. In air quality impact assessment, this approach is usually applied where there is uncertainty as to the accuracy of assessment datasets such as monitoring data, vehicle emissions, future background concentrations and the timing of emission releases.

1.2.1.2. The Applicant has summarised the conservative approaches applied in submissions made at Deadline 6 (REP6-061 and REP6-069) and Deadline 7 (REP7-072) of the Examination and these are reproduced in Table 1.1.

Table 1.1 - Modelled conservatism

Dataset	ES	ES Addendum	CAZ sensitivity testing note
Road closures and diversions	52 weeks	52 weeks	52 weeks
Emission Factors	EFTv9	EFTv9	EFTv10.1
Uptake of clean vehicles compliant with CAZ	EFTv9	EFTv9	EFTv10.1 with PCC CAZ OBC flows applied.

1.2.1.3. The approach taken to the modelling completed in the CAZ Sensitivity Testing is therefore the least conservative of the examination submissions. However, one element of conservatism was retained in that work which is the assumption that road closures and diversions will be in place throughout construction year 2022. This assumption was retained because the specific days where road closures and diversions will be required during the application stage have not yet been approved and therefore cannot be accurately represented in the air quality model.

1.3. THE FRAMEWORK TRAFFIC MANAGEMENT STRATEGY

1.3.1.1. The Framework Traffic Management Strategy (FTMS) (AS-072) Section 10, outlines the general restrictions which will be placed on works along the A2030 Eastern Road by PCC as the local highway authority. Tables 24 and Table 25 of that report reproduced here as Table 1.2 and Table 1.3, indicate the total availability of Eastern Road between Airport Service Road and Tangier Road (Section 8.1) and between Tangier Road and Eastern Avenue (Section 8.2) for completion of the construction works, as provisionally agreed with the highway authority.

1.3.1.2. Other road closures and diversions are proposed during construction. However, these are relevant to localised situations along the Onshore Cable Corridor and will not lead to significant redistribution of traffic across the wider local and strategic road networks.

Table 1.2 - Works requirements and Highways Authority restrictions for sub-section 8.1 A2030 Eastern Road between the junction with Airport Service Road and Tangier Road

Section	Description	Length (m)	Proposed TM	Duration Per Circuit
8.1	A2030 Eastern Road between Airport Service Road and Tangier Road	1200	Lane Closures	5 Weeks (24hr, 7-Day construction) 8 Weeks (10hr, 7-Day construction)

Calendar Restrictions

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Notes on Calendar Restrictions:
Work Permitted Only During: Easter Holidays (2 weeks), May Half-Term (1-week), June, July and August (approximately 13 weeks, with avoidance of the Victorious Festival Weekend).
Approximate availability: 16 weeks.

Red **Full month restriction**

Amber **Partial Month restriction**

Green **No restriction**

Other Restrictions

Traffic management to be removed on Portsmouth FC home match days

Sections	Total Availability per Calendar Year
Sub-section 8.2 – 2-11 weeks	8-14 weeks *(depending upon option used for Sub-Section 8.2)*

Table 1.3 - Works requirements and Highways Authority restrictions for sub-section 8.2 A2030 Eastern Road between Tangier Road and Eastern Avenue

<table>
<tr><th>Section</th><th>Description</th><th>Length (m)</th><th>Proposed TM</th><th>Duration Per Circuit</th></tr>
<tr><td>8.2 Option 1</td><td>Both Circuits within Milton Common</td><td>Up to 300m in carriageway</td><td rowspan="3">Lane Closure</td><td>1-2 week (24hr, 7-day working) – 2 weeks (10hr, 7-day working)</td></tr>
<tr><td>8.2 Option 2</td><td>One Circuit within Milton Common</td><td rowspan="2">1300m</td><td>8 weeks (10hr, 7-day working)</td></tr>
<tr><td>8.2 Option 3</td><td>Both Circuits within the A2030 Eastern Road</td><td>11 weeks (10hr, Mon-Fri plus 5hr on Saturdays)</td></tr>
<tr><td colspan="5">Calendar Restrictions</td></tr>
<tr><td colspan="5">
<table>
<tr><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>Jun</th><th>Jul</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
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</table>
Notes on Calendar Restrictions:
Work Permitted Only During: Easter Holidays (2 weeks), May Half-Term (1-week), June, July and August (approximately 13 weeks, with avoidance of the Victorious Festival Weekend).
Approximate availability: 17 weeks.
Red Full month restriction
Amber Partial Month restriction
Green No restriction
</td></tr>
<tr><td colspan="5">Other Restrictions</td></tr>
<tr><td colspan="5">Traffic management to be removed on Portsmouth FC home match days</td></tr>
</table>

Sections	Total Availability per Calendar Year
Sub-Section 8.1 – 5-8 weeks *(depending upon working hours used)*	9-12 weeks *(depending upon working hours used for Sub-Section 8.1)*

1.3.1.3. Given that the actual highway availability for works due to working restrictions is significantly less than 52 weeks assumed in the air quality modelling for the ES (REP1-033) and the CAZ Sensitivity Testing Assessment (REP7-072), it was agreed during ISH 5 that the Applicant would provide updated results which are weighted to account for the actual highway availability for construction activities.

1.3.1.4. Table 1.2 and Table 1.3 show that work will be permitted only during the Easter Holidays (2 weeks), May Half-Term (1-week), June, July and August (approximately 13 weeks, with avoidance of the Victorious Festival Weekend). Road closures and diversions on Eastern Road will be required for 16 weeks (Section 8.1) and 17 weeks (Section 8.2) on Eastern Road. Therefore, road closures and diversions will not be in place for more than a total of 17 weeks in any construction year because all construction activities (Section 8.1 and Section 8.2) must be completed when the highway is available.

2. METHODOLOGY

2.1.1.1. As the traffic management described in the FTMS (AS-072) will be in place during the periods shown in Table 1.2 and Table 1.3, the exact dates of construction activities within these periods are unknown and so were not applied to the dispersion modelling. The dispersion model therefore assumes traffic management is in place for the whole year which yields the conservative results reported in this CAZ Sensitivity Testing note.

2.1.1.2. The methodology used is based on that used for point sources described in the Environment Agency guidance (Environment Agency, 2021) where a proportional factor can be applied to an emissions component that does not operate for an entire year.

2.1.1.3. Factoring was undertaken on the road-NO_x component of the difference between DM and DS1, and DM and DS2 scenarios, which were obtained from the CAZ Sensitivity Test modelling. A worst-case scenario was used whereby the longer period of highway availability from Table 25 of the FTMS (AS-072) was applied to the predicted road-NO_x component. This factor was derived from a period of works of 17 weeks in a 52-week year with a multiplier of 0.33 applied to the CAZ Sensitivity Test road-NO_x predictions.

2.1.1.4. The following calculation example, for receptor ID 573 on A3 Alfred Road in scenarios DS1 is as shown in Table 2.1.

Table 2.1 - Illustration of factoring applied to road NO_x

	DM (µg/m³)	DS1 (µg/m³)	Difference (µg/m³)
52-Week Model road-NO_x	51.1	52.4	+1.3
Factor	17/52	17/52	-
17-week Factored road-NO_x	16.7	17.1	+0.4
17-week Factored road-NO_2	-	-	+0.2

2.1.1.5. The change in road-NO_2 between the DM and the DS1 and DS2 scenarios was then obtained using the Defra NO_x to NO_2 Calculator v8.1. This was compared to the 'tolerance' which is the difference between the results in Table 6-6 of the Air Quality Local Plan report informing the full business case (Aecom, 2020) and the EU Limit as applied by PCC.

3. RESULTS

3.1.1.1. Table 3.1 shows the change in NO_2 required at each of the locations required to meet the NO_2 EU Limit Value and the contribution to local air quality from the Proposed Development.

3.1.1.2. The tolerance and factored results for the DS1 and DS2 scenarios for all exceedance and near exceedance areas are shown in Table 3.1.

Table 3.1 - Roadside receptor sites with the change in Road NO_x required to achieve the limit value (based on emission factors toolkit v10.1, 2018-base year Defra backgrounds and the NO_x to NO_2 Calculator v8.1)

Rec. ID	Road Name	AQAP CAZ Road NO_2 ($\mu g/m^3$)*	Tolerance ($\mu g/m^3$)	DS1 AQUIND Factored NO_2 change ($\mu g/m^3$)	DS2 AQUIND Factored NO_2 change ($\mu g/m^3$)
Road sections on the local network modelled as exceeding the EU limit (40 $\mu g/m^3$) in 2022**					
573	A3 Alfred Road (Unicorn Road to Queen Street south-bound)	40.2	+0.3	+0.2	+0.2
546	A3 Commercial Road (south of Church Street Roundabout)	39.5	+1.0	+0.1	+0.1
Road sections on the local network modelled not exceeding the EU limit but above 37 $\mu g/m^3$ in 2022					
526	Church Street (east of Church Street roundabout)	38.7	+1.8	+0.2	+0.2
536	A3 Hope Street (south of Church Street roundabout)	37.8	+2.7	+0.1	+0.1
824	A2030 Eastern Road Water Bridge (south-bound)	38.5	+2.0	+0.2	+0.3

Rec. ID	Road Name	AQAP CAZ Road NO_2 ($\mu g/m^3$)*	Tolerance ($\mu g/m^3$)	DS1 AQUIND Factored NO_2 change ($\mu g/m^3$)	DS2 AQUIND Factored NO_2 change ($\mu g/m^3$)
648	A2047 London Road (Stubbington Avenue to Kingston Crescent south-bound)	37.9	+2.6	+0.2	+0.1
520	Mile End Road (north of Church Road roundabout)	36.9	3.6	+0.2	+0.1
Road sections on the strategic road network exceeding the EU Limit (40 $\mu g/m^3$) in 2022**					
986	A27 (north of Portsea Island west-bound)	**48.2**	0.0	+0.2	+0.2
1089	A27 (east of Portsea Island west-bound)	**46.0**	0.0	-0.2	-0.2
11	M27 (west of Portsea Island west-bound)	**45.3**	0.0	-0.1	-0.1
968	A27 (north of Portsea Island east-bound)	**43.1**	0.0	+0.2	+0.2
834	A27 (east of Portsea Island east-bound)	**40.8**	0.0	-0.2	-0.2

The AQAP CAZ results are those presented in Table 6-6 of the full business case small area CAZ (with approved boundary changes) + Parking + Revised Alfred Road signals scheme)

**PCC have interpreted the statutory EU Limit of 40.0 $\mu g/m^3$ as 40.49 $\mu g/m^3$ in the 2019 Air Quality Local Plan.

3.1.1.3. Table 3.1 shows that the impacts from the Proposed Development are lower with the application of the time factor than those reported in the CAZ Sensitivity Testing assessment (REP7-072). However, given the negligible magnitude of the initial changes, the changes with application of the factor to the change in road-NO_x contributions is equally small.

3.1.1.4. Table 3.1 shows the tolerance available at each of the receptor locations before the limit value is exceeded. It shows that under scenarios DS1 and DS2 the change in NO_2 at each of the exceedance and near exceedance locations is significantly lower than the tolerance before the limit value of 40 µg/m³ for NO_2 is exceeded.

3.1.1.5. Specific concern was raised by PCC over compliance at receptor ID 573 at A3 Alfred Road at Deadline 7c. At Alfred Road, the tolerance was determined to be +0.3 µg/m³ as the difference between the Air Quality Local Plan prediction of 40.2 µg/m³ and the EU Limit value of 40.49 µg/m³ as applied by PCC. The factored concentration of +0.2 µg/m³ is with this tolerance value which indicates that EU Limit compliance will not be compromised by the Proposed Development at this location.

4. CONCLUSION

4.1.1.1. In the ES and CAZ Sensitivity Testing assessment work, a professional judgement was made as to whether an increase in predicted NO_2 concentrations will cause an exceedance of the EU Limit based on both the modelled predictions and the conservatism in the model. This is best practice in air quality assessment in accordance with the requirements of Section 7 of the Institute of Air Quality Management and Environment Protection UK guidance 'Land Use Planning & Development Control: Planning for Air Quality' (Institute of Air Quality Management, 2017) which at paragraph 7.7 states:

> *Any judgement on the overall significance of effect of a development will need to take into account such factors as:*
>
> - *The influence and validity of any assumptions adopted when undertaking the prediction of impacts.*

4.1.1.2. The results of the CAZ Sensitivity Testing assessment work have been reproduced with the removal of the final element of conservatism which is the assumption that road closures and diversions will be required for 52 weeks of the year. The predicted increases reported in this Technical Note now reflect the release of emissions in the actual time available for the Eastern Road construction works which is 17 weeks. This removes the need for professional judgement and allows the direct comparison between the predicted increase and available tolerance.

4.1.1.3. The new results show that under scenarios DS1 and DS2 the change in NO_2 at each of the exceedance and near exceedance locations is significantly lower than the tolerance before the limit value of 40 µg/m³ for NO_2 is exceeded. This applies to ID 573 at A3 Alfred Road where the factored concentration is below the tolerance value which indicates that EU Limit compliance will not be compromised.

4.1.1.4. The Applicant therefore maintains its position that the Proposed Development will not inhibit compliance with the EU Directive at receptor 573 on Alfred Road or any other of the exceedance or near exceedance areas on the local and strategic road network.

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