



South East Strategic Reservoir Option
Preliminary Environmental Information Report

Appendix 13.3 - Air quality assessment results

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1 Appendix 13.3: Air Quality Assessment Results

1.1 Introduction

- 1.1.1 This document provides supplementary assessment result information relevant to the air quality assessment for Project. It forms an appendix to Chapter 13: Air quality.

1.2 Construction

- 1.2.1 This section provides the supplementary results relevant to the assessment of construction-related activities on air quality, including construction dust, construction site equipment and vehicle exhaust emissions.

Construction dust

- 1.2.2 The Project would require the following dust-generating activities: demolition of existing properties and clearance of structures from the Site, construction and earthworks, with associated trackout.

Sensitive receptors

- 1.2.3 Sensitive receptors are defined as those properties/ schools/ hospitals that are likely to experience a change in pollutant concentrations and/ or dust nuisance due to the construction of the Project.
- 1.2.4 There are more than 100 sensitive human receptors within 20m of the draft Order limits which are considered 'high sensitivity receptors' in accordance with the Institute of Air Quality Management (IAQM) dust guidance (IAQM, 2024).
- 1.2.5 There are Local Wildlife Sites (LWS) identified within 50m of the draft Order limits that are sensitive to dust soiling and PM₁₀ exposure. These sites include Marcham Salt Spring LWS (ID: E01), Cowslip Meadow LWS (ID: E02) and the Cuttings and Hutchins Copse LWS (ID: E03). These sites are considered 'low sensitivity receptors' in accordance with the IAQM dust guidance (IAQM, 2024).

Magnitude of impacts

- 1.2.6 Based on the current available construction assumptions and parameters, the dust emission magnitudes of the Project are considered to be large for demolition, earthworks, construction and trackout (Table 1.1).

Table 1.1 Dust emission magnitude for dust generating activities

Activity	Dust emission magnitude	Reasoning
Demolition	Large	Total volume for the removal of existing properties and site clearance for enabling works >75,000m ³ , including potentially dusty construction materials.

Activity	Dust emission magnitude	Reasoning
Earthworks	Large	Total site area >110,000 m ² , involving excavation, handling and stock piling for various project components, including the main reservoir, shaft, borrow pits and foundations supporting embankments.
Construction	Large	Total building volume >75,000 m ³ , involving the construction of associated structures such as reservoir towers, pumping stations, river tunnels and other infrastructures.
Trackout	Large	>50 HDV (>3.5t) trips in any one day, potentially dusty surface material (e.g. high clay content)

Sensitivity of the area

- 1.2.7 The sensitivity of areas to potential dust soiling effects on people and property, human health and ecological impacts has been determined for the dust generating activities for the Project.
- 1.2.8 A set of distance criteria (20m, 50m, 100m and 250m) from the IAQM dust guidance (IAQM, 2024) has been used to determine the sensitivity of areas. The construction dust buffers are presented in Figure 13.3: Construction dust buffers and ecological receptors.
- 1.2.9 The sensitivity of the area for the potential dust soiling effects on people and property is defined as high due to the presence of more than 100 high sensitivity receptors within 20m of the draft Order limits.
- 1.2.10 The highest Defra background concentration for annual mean PM₁₀ for the peak construction year 2036 is 14.5µg/m³, which is below the 24µg/m³ threshold stipulated in the IAQM dust guidance (IAQM, 2024). Therefore, sensitivity of the area to potential human health impacts has been assigned as moderate.
- 1.2.11 For ecological receptors, the sensitivity of the area to potential ecological effects has been assigned as low due to the presence of low sensitivity receptors (LWS) within 20m of the draft Order limits.

Risk of impacts

- 1.2.12 Taking into consideration the dust emission magnitude and the sensitivity of the area, the assessed risk level of potential dust impacts for each of the construction activities are summarised in Table 1.2. The risk level determines the level of mitigation that must be applied. Site-specific mitigations proportionate to the level of risk are set out in Section 6. The risk for potential dust soiling is assessed as high risk, while the risk to human health ranges from high to medium risk. The risk for ecological impact ranges from medium to low risk. Following the implementation of effective mitigation, the potential impacts of dust soiling, human health and ecological impacts should be negligible and therefore effects are not considered significant.

Table 1.2 Summary dust risk table prior to mitigation

Activity	Dust Soiling	Human Health	Ecological
Demolition	High risk	High risk	Medium risk
Earthworks	High risk	Medium risk	Low risk
Construction	High risk	Medium risk	Low risk
Trackout	High risk	Medium risk	Low risk

Construction site equipment

- 1.2.13 Details of the equipment and durations of use are not available at this stage. Where receptors are within 100m they would be considered to be a higher risk in terms of NRMM emissions. The locations where the compounds are closest to sensitive receptors are presented in Table 1.3. These compound locations are greater than 100m from receptors and are therefore not considered to be high risk.
- 1.2.14 At this stage no high risk compound sites have been identified. The design will be reviewed for the ES based on any changes or additional information being made available. Where sites are within 100m additional site management practices should be implemented to mitigate potential from NRMM exhaust emissions.
- 1.2.15 For all sites where receptors are located within 100m additional site management practices should be considered for example:
- Locating site equipment away from the nearest receptors and maximising the distance between the equipment and receptors
 - Prioritising use of electric or low emissions equipment at these compound areas
 - Prioritising early engagement for provision of electrical supply to these compound areas
 - Consideration of load management software to minimise emissions
 - Consideration of hording to provide a physical barrier to emissions
 - Minimising equipment use through planning or prefabrication
 - Installing additional flues to increase the release height of emission to aid dispersion if required
- 1.2.16 Once the temporary construction compound areas and highways laydown area plans are considered, the solutions above should be built into the design to minimise emissions.

Table 1.3 Compounds closest to receptors

Compound ID	Location	Proximity to the nearest receptors (m)
C4	A338 East Hanney access (SW)	190m south-east to East Hanney village
C13	A34 junction improvement compound	190m south-west to Marcham Road commercial centre

Vehicle exhaust emissions

- 1.2.17 Table 1.4 and Table 1.5 below present the findings of the semi-quantitative impact assessment for construction traffic. The table shows the changes in traffic data (AADT for LDVs and HDVs), maximum percentage change in pollutant concentrations for NO₂ and PM₁₀, and the corresponding impact descriptors for each sensitive human receptor. The results indicated that the potential changes in concentrations are unlikely to exceed the objectives for annual mean NO₂ (40µg/m³) and PM₁₀ (40µg/m³).

Table 1.4 Construction traffic annual mean NO₂ results

Receptor ID	Traffic ID	Road Name	AQMA	Change in AADT		Baseline concentration in 2036 (µg/m ³) ^[1]	Likely maximum % change in concentration ^[2]	Impact descriptor ^[3]	Potential to exceed annual mean objectives (40µg/m ³)	Significance of effect
				LDVs	HDVs					
H03	A27	A34 north	No	595	167	6.7	<10%	Minor	No	Not significant
H04	A28	A34 middle	No	670	125	7.7	<10%	Minor	No	Not significant
H05	A29	A34 south	No	735	111	7.5	<10%	Minor	No	Not significant
H06	A30	Frilford Rd	Yes	261	0	4.9	<5%	Negligible	No	Not significant
H07	A31	A415 Marcham Rd	No	1,144	200	5.7	<10%	Minor	No	Not significant
H08	A32	A415 Marcham Rd	No	1,144	200	5.7	<10%	Minor	No	Not significant
H09 ^[4]	Z1	Site Access / Construction trips (Compound A1)	No	595	167	4.9	N/A	N/A	No	Not significant
H10 ^[4]	X	A34 north, between A423 and A44	No	308	167	7.4	N/A	N/A	No	Not significant

Receptor ID	Traffic ID	Road Name	AQMA	Change in AADT		Baseline concentration in 2036 ($\mu\text{g}/\text{m}^3$) ^[1]	Likely maximum % change in concentration ^[2]	Impact descriptor ^[3]	Potential to exceed annual mean objectives ($40\mu\text{g}/\text{m}^3$)	Significance of effect
				LDVs	HDVs					

Note:

^[1] 2036 Defra background concentration.

^[2] The percentage change in pollutant concentration is determined using professional judgment, with reference to the EPUK/ IAQM land-use and planning (EPUK and IAQM, 2017) screening criteria for detailed modelling. A <5% change in concentration is equivalent to <2 $\mu\text{g}/\text{m}^3$ in annual mean NO₂, and a <10% change is equivalent to <4 $\mu\text{g}/\text{m}^3$ in annual mean NO₂.

^[3] The impact descriptors for individual receptors as outlined in EPUK/IAQM land-use and planning guidance are presented in Table 13.10 of Chapter 13: Air quality.

^[4] New receptor introduced due to the Project and it is not required to apply the EPUK/IAQM impact descriptor.

Table 1.5 Construction traffic annual mean PM₁₀ results

Receptor ID	Traffic ID	Road Name	AQMA	Change in AADT		Baseline concentration in 2036 ($\mu\text{g}/\text{m}^3$) ^[1]	Likely maximum % change in concentration ^[2]	Impact descriptor ^[3]	Potential to exceed annual mean objectives ($50\mu\text{g}/\text{m}^3$)	Significance of effect
				LDVs	HDVs					
H03	A27	A34 north	No	595	167	13.9	<10%	Minor	No	Not significant
H04	A28	A34 middle	No	670	125	14.5	<10%	Minor	No	Not significant
H05	A29	A34 south	No	735	111	14.4	<10%	Minor	No	Not significant
H06	A30	Frilford Rd	Yes	261	0	12.1	<5%	Negligible	No	Not significant

Receptor ID	Traffic ID	Road Name	AQMA	Change in AADT		Baseline concentration in 2036 ($\mu\text{g}/\text{m}^3$) ^[1]	Likely maximum % change in concentration ^[2]	Impact descriptor ^[3]	Potential to exceed annual mean objectives ($50\mu\text{g}/\text{m}^3$)	Significance of effect
				LDVs	HDVs					
H07	A31	A415 Marcham Rd	No	1,144	200	13.9	<10%	Minor	No	Not significant
H08	A32	A415 Marcham Rd	No	1,144	200	13.9	<10%	Minor	No	Not significant
H09 ^[4]	Z1	Site Access / Construction trips (Compound A1)	No	595	167	11.9	N/A	N/A	No	Not significant
H10 ^[4]	X	A34 north, between A423 and A44	No	308	167	13.8	N/A	N/A	No	Not significant

Note:

^[1] 2036 Defra background concentration.

^[2] The percentage change in pollutant concentration is determined using professional judgment, with reference to the EPUK/ IAQM land-use and planning (EPUK and IAQM, 2017) screening criteria for detailed modelling. A <5% change in concentration is equivalent to $<2\mu\text{g}/\text{m}^3$ in annual mean PM_{10} , and a <10% change is equivalent to $<4\mu\text{g}/\text{m}^3$ in annual mean PM_{10} .

^[3] The impact descriptors for individual receptors as outlined in EPUK/IAQM land-use and planning guidance are presented in Table 13.10 of Chapter 13: Air quality.

^[4] New receptor introduced due to the Project and it is not required to apply the EPUK/IAQM impact descriptor.

1.3 Operation

- 1.3.1 This section provides the supplementary results relevant to the assessment of operational-related activities on air quality, including vehicle exhaust emissions and operational odour.

Vehicle exhaust emissions

- 1.3.2 Table 1.6 and Table 1.7 below present the findings of the semi-quantitative impact assessment for construction traffic. The table shows the changes in traffic data (AADT for LDVs and HDVs), maximum percentage change in pollutant concentrations for NO₂ and PM₁₀, and the corresponding impact descriptors for each sensitive human receptor. The results indicated that the potential changes in concentrations are unlikely to exceed the objectives for annual mean NO₂ (40µg/m³) and PM₁₀ (40µg/m³).

Table 1.6 Operational traffic annual mean NO₂ results

Receptor ID	Traffic ID	Road Name	AQMA	Change in AADT		Baseline concentration in 2040 (µg/m³) ^[1]	Likely maximum % change in concentration ^[2]	Impact descriptor ^[3]	Potential to exceed annual mean objectives (40µg/m³)	Significance of effect
				LDVs	HDVs					
H01	A15	B4017 High St	No	503	0	5.1	<5%	Negligible	No	Not significant
H02	A26b	Hanney Rd	No	521	0	5.2	<5%	Negligible	No	Not significant
H03	A27	A34 north	No	1,120	6	6.4	<10%	Minor	No	Not significant
H04	A28	A34 middle	No	1,347	6	7.4	<10%	Minor	No	Not significant
H05	A29	A34 south	No	1,328	6	7.2	<10%	Minor	No	Not significant
H06	A30	Frilford Rd	Yes	351	0	4.6	<5%	Negligible	No	Not significant
H07	A31	A415 Marcham Rd	No	1,144	200	5.4	<10%	Minor	No	Not significant
H08	A32	A415 Marcham Rd	No	1,144	200	5.4	<10%	Minor	No	Not significant
H09 ^[4]	Z1	Site Access / Construction trips (Compound A1)	No	1,126	200	4.7	<10%	Minor	No	Not significant

Receptor ID	Traffic ID	Road Name	AQMA	Change in AADT		Baseline concentration in 2040 ($\mu\text{g}/\text{m}^3$) ^[1]	Likely maximum % change in concentration ^[2]	Impact descriptor ^[3]	Potential to exceed annual mean objectives ($40\mu\text{g}/\text{m}^3$)	Significance of effect
				LDVs	HDVs					
H11 ^[4]	Z6	Southern site access	No	609	0	4.3	<10%	Minor	No	Not significant
Note: ^[1] The Defra background concentrations for 2040 have been used. As projections beyond 2040 are unavailable, the 2040 values are considered representative for the opening year 2043. ^[2] The percentage change in pollutant concentration is determined using professional judgment, with reference to the EPUK/ IAQM land-use and planning (EPUK and IAQM, 2017) screening criteria for detailed modelling. A <5% change in concentration is equivalent to <2$\mu\text{g}/\text{m}^3$ in annual mean NO₂, and a <10% change is equivalent to <4$\mu\text{g}/\text{m}^3$ in annual mean NO₂. ^[3] The impact descriptors for individual receptors as outlined in EPUK/IAQM land-use and planning guidance are presented in Table 13.10 of Chapter 13: Air quality. ^[4] New receptor introduced due to the Project and it is not required to apply the EPUK/IAQM impact descriptor.										

Table 1.7 Operational traffic annual mean PM₁₀ results

Receptor ID	Traffic ID	Road Name	AQMA	Change in AADT		Baseline concentration in 2040 ($\mu\text{g}/\text{m}^3$) ^[1]	Likely maximum % change in concentration ^[2]	Impact descriptor ^[3]	Potential to exceed annual mean objectives ($50\mu\text{g}/\text{m}^3$)	Significance of effect
				LDVs	HDVs					
H01	A15	B4017 High St	No	503	0	11.6	<5%	Negligible	No	Not significant
H02	A26b	Hanney Rd	No	521	0	13.1	<5%	Negligible	No	Not significant

Receptor ID	Traffic ID	Road Name	AQMA	Change in AADT		Baseline concentration in 2040 ($\mu\text{g}/\text{m}^3$) ^[1]	Likely maximum % change in concentration ^[2]	Impact descriptor ^[3]	Potential to exceed annual mean objectives ($50\mu\text{g}/\text{m}^3$)	Significance of effect
				LDVs	HDVs					
H03	A27	A34 north	No	1,120	6	13.7	<10%	Minor	No	Not significant
H04	A28	A34 middle	No	1,347	6	14.3	<10%	Minor	No	Not significant
H05	A29	A34 south	No	1,328	6	14.2	<10%	Minor	No	Not significant
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H11 ^[4]	Z6	Southern site access	No	609	0	11.3	<10%	Minor	No	Not significant
Note: ^[1] The Defra background concentrations for 2040 have been used. As projections beyond 2040 are unavailable, the 2040 values are considered representative for the opening year 2043.										

Receptor ID	Traffic ID	Road Name	AQMA	Change in AADT		Baseline concentration in 2040 (µg/m³) ^[1]	Likely maximum % change in concentration ^[2]	Impact descriptor ^[3]	Potential to exceed annual mean objectives (50µg/m³)	Significance of effect
				LDVs	HDVs					
^[2] The percentage change in pollutant concentration is determined using professional judgment, with reference to the EPUK/ IAQM land-use and planning (EPUK and IAQM, 2017) screening criteria for detailed modelling. A <5% change in concentration is equivalent to <2µg/m³ in annual mean PM ₁₀ , and a <10% change is equivalent to <4µg/m³ in annual mean PM ₁₀ .										
^[3] The impact descriptors for individual receptors as outlined in EPUK/IAQM land-use and planning guidance are presented in Table 13.10.										
^[4] New receptor introduced due to the Project and it is not required to apply the EPUK/IAQM impact descriptor.										

Operational odour

Table 1.8 SPR assessment results

Potential odour source	Receptor location and name	Distance from the odour source (m)	Pathway (transport effectiveness)	Risk of odour exposure	Receptor sensitivity	Mangnitude of odour effect
Removal of mussels	32 Willow Way residential property (SPR01)	90 downwind	Moderately effective	Low risk	High	Minor adverse
Abingdon STW upgrade	32 Willow Way residential property (SPR01)	170 downwind	Moderately effective	Low risk	High	Minor adverse
Foul drainage discharge treatment	8 Blenheim Orchard residential property (SPR02)	500 downwind	Moderately effective	Low risk	High	Minor adverse
Drayton STW connection	14 Haywards Road residential property (SPR03)	<10 downwind	Moderately effective	Low risk	High	Minor adverse
Note: An SPR assessment for potential operational odour impacts is undertaken in accordance with the IAQM guidance on the assessment of odour for planning (IAQM, 2018) based on the current available information.						

References

Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) (2017). Land-Use Planning & Development Control: Planning for Air Quality (Version 1.2). Accessed April 2025. <https://iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf>

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