



UNIVERSAL DESTINATIONS & EXPERIENCES UK PROJECT

Former Kempston Hardwick Brickworks
and adjoining land, Bedford

Environmental Statement Volume 3

Appendix 8.3 - Background Air Pollution Data

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1. BACKGROUND AIR POLLUTION DATA

Table 1-1 - Annual Mean Background Pollutant Concentrations ($\mu\text{g}/\text{m}^3$) for Human Receptors

| X,Y | Relevant Receptors | Local Authority | NO ₂ 2023 | PM ₁₀ 2023 | PM _{2.5} 2023 | NO ₂ 2029 | PM ₁₀ 2029 | PM _{2.5} 2029 | NO ₂ 2031 | PM ₁₀ 2031 | PM _{2.5} 2031 | NO ₂ 2041/2051 * | PM ₁₀ 2041/2051 * | PM _{2.5} 2041/2051 * |
|----------------|--------------------|------------------------------------|----------------------|-----------------------|------------------------|----------------------|-----------------------|------------------------|----------------------|-----------------------|------------------------|-----------------------------|------------------------------|-------------------------------|
| 501500, 244500 | 1, 2, 3, 4, 5 | Bedford Borough Council (BC) | 8.83 | 14.35 | 7.23 | 7.16 | 13.80 | 6.74 | 6.63 | 13.65 | 6.61 | 5.54 | 13.14 | 6.13 |
| 502500, 245500 | 6, 7, 8 | Bedford BC | 9.38 | 14.86 | 7.26 | 7.55 | 14.31 | 6.78 | 6.99 | 14.17 | 6.65 | 5.88 | 13.67 | 6.18 |
| 502500, 244500 | 9, 10, 11, 12 | Bedford BC | 7.99 | 13.56 | 7.01 | 6.81 | 13.01 | 6.53 | 6.42 | 12.86 | 6.40 | 5.54 | 12.36 | 5.93 |
| 503500, 244500 | 13, 14, 15 | Bedford BC | 8.37 | 12.27 | 6.92 | 7.35 | 11.73 | 6.45 | 6.98 | 11.59 | 6.31 | 6.18 | 11.09 | 5.84 |
| 503500, 245500 | 16 | Bedford BC | 8.53 | 14.60 | 7.14 | 7.24 | 14.04 | 6.67 | 6.83 | 13.91 | 6.54 | 5.97 | 13.46 | 6.08 |
| 503500, 243500 | 17, 18, 19, 20, 24 | Central Bedfordshire Council (CBC) | 8.11 | 12.96 | 6.94 | 7.14 | 12.42 | 6.47 | 6.79 | 12.27 | 6.34 | 6.03 | 11.78 | 5.87 |
| 504500, 243500 | 21, 22, 23, 72 | CBC | 7.39 | 13.08 | 6.92 | 6.34 | 12.53 | 6.44 | 6.00 | 12.38 | 6.31 | 5.24 | 11.87 | 5.83 |

| X,Y | Relevant Receptors | Local Authority | NO ₂ 2023 | PM ₁₀ 2023 | PM _{2.5} 2023 | NO ₂ 2029 | PM ₁₀ 2029 | PM _{2.5} 2029 | NO ₂ 2031 | PM ₁₀ 2031 | PM _{2.5} 2031 | NO ₂ 2041/2 051 * | PM ₁₀ 2041/2 051 * | PM _{2.5} 2041/2 051 * |
|----------------|----------------------------|-----------------|----------------------|-----------------------|------------------------|----------------------|-----------------------|------------------------|----------------------|-----------------------|------------------------|------------------------------|-------------------------------|--------------------------------|
| 503500, 242500 | 25 | CBC | 7.68 | 14.17 | 7.04 | 6.68 | 13.60 | 6.56 | 6.34 | 13.46 | 6.43 | 5.58 | 13.00 | 5.96 |
| 502500, 241500 | 26, 27 | Bedford BC | 7.93 | 12.70 | 6.93 | 6.98 | 12.15 | 6.46 | 6.64 | 12.00 | 6.33 | 5.89 | 11.49 | 5.85 |
| 502500, 242500 | 28, 29, 33, 34, 35, 36, 65 | Bedford BC | 8.07 | 12.58 | 7.04 | 7.05 | 12.02 | 6.55 | 6.70 | 11.87 | 6.41 | 5.90 | 11.34 | 5.92 |
| 501500, 242500 | 30, 31, 32, 66, 67, 68 | Bedford BC | 7.64 | 11.68 | 6.82 | 6.49 | 11.13 | 6.34 | 6.11 | 10.98 | 6.21 | 5.26 | 10.46 | 5.73 |
| 502500, 243500 | 37 | Bedford BC | 7.76 | 12.55 | 6.88 | 6.70 | 12.00 | 6.40 | 6.34 | 11.85 | 6.27 | 5.51 | 11.35 | 5.80 |
| 500500, 243500 | 38, 39 | Bedford BC | 8.33 | 13.04 | 6.99 | 6.76 | 12.50 | 6.51 | 6.28 | 12.35 | 6.38 | 5.26 | 11.84 | 5.90 |
| 500500, 242500 | 40, 41, 42, 43, 47 | CBC | 8.32 | 12.61 | 6.99 | 6.88 | 12.07 | 6.51 | 6.42 | 11.92 | 6.38 | 5.41 | 11.40 | 5.90 |
| 499500, 242500 | 44, 45, 46, 48 | CBC | 8.39 | 13.85 | 7.20 | 6.85 | 13.30 | 6.72 | 6.37 | 13.15 | 6.58 | 5.35 | 12.63 | 6.09 |
| 499500, 241500 | 49, 50, 51 | CBC | 8.88 | 13.97 | 7.61 | 7.26 | 13.37 | 7.08 | 6.75 | 13.22 | 6.94 | 5.66 | 12.63 | 6.39 |
| 498500, 241500 | 52 | CBC | 9.08 | 14.87 | 7.27 | 7.41 | 14.36 | 6.82 | 6.89 | 14.21 | 6.69 | 5.77 | 13.70 | 6.22 |

| X,Y | Relevant Receptors | Local Authority | NO ₂ 2023 | PM ₁₀ 2023 | PM _{2.5} 2023 | NO ₂ 2029 | PM ₁₀ 2029 | PM _{2.5} 2029 | NO ₂ 2031 | PM ₁₀ 2031 | PM _{2.5} 2031 | NO ₂ 2041/2 051 * | PM ₁₀ 2041/2 051 * | PM _{2.5} 2041/2 051 * |
|----------------|--------------------|-----------------|----------------------|-----------------------|------------------------|----------------------|-----------------------|------------------------|----------------------|-----------------------|------------------------|------------------------------|-------------------------------|--------------------------------|
| 504500, 247500 | 53, 54, 55, 56 | Bedford BC | 10.54 | 13.27 | 7.48 | 8.78 | 12.73 | 6.99 | 8.21 | 12.58 | 6.86 | 7.08 | 12.06 | 6.36 |
| 505500, 246500 | 57, 58 | Bedford BC | 8.98 | 14.58 | 7.27 | 7.30 | 14.03 | 6.78 | 6.77 | 13.88 | 6.65 | 5.75 | 13.37 | 6.17 |
| 505500, 247500 | 59 | Bedford BC | 9.88 | 13.62 | 7.49 | 7.97 | 13.07 | 6.99 | 7.37 | 12.92 | 6.85 | 6.25 | 12.39 | 6.34 |
| 507500, 247500 | 60 | Bedford BC | 9.34 | 13.87 | 7.28 | 7.25 | 13.31 | 6.77 | 6.62 | 13.16 | 6.64 | 5.44 | 12.64 | 6.15 |
| 505500, 245500 | 61, 70 | Bedford BC | 8.11 | 14.07 | 7.09 | 6.73 | 13.52 | 6.61 | 6.30 | 13.37 | 6.47 | 5.41 | 12.86 | 5.99 |
| 505500, 244500 | 62 | Bedford BC | 7.79 | 12.88 | 7.03 | 6.48 | 12.31 | 6.53 | 6.07 | 12.16 | 6.39 | 5.21 | 11.63 | 5.90 |
| 502500, 246500 | 63 | Bedford BC | 9.97 | 13.84 | 7.33 | 7.89 | 13.29 | 6.84 | 7.25 | 13.15 | 6.70 | 6.06 | 12.65 | 6.22 |
| 501500, 246500 | 64 | Bedford BC | 7.69 | 12.24 | 6.95 | 6.40 | 11.68 | 6.45 | 5.99 | 11.53 | 6.32 | 5.12 | 11.01 | 5.83 |
| 504500, 246500 | 69 | Bedford BC | 11.58 | 16.07 | 7.53 | 9.48 | 15.54 | 7.06 | 8.80 | 15.39 | 6.93 | 7.45 | 14.92 | 6.46 |
| 504500, 244500 | 71 | Bedford BC | 7.81 | 12.66 | 6.90 | 6.71 | 12.11 | 6.42 | 6.36 | 11.97 | 6.29 | 5.60 | 11.46 | 5.82 |

| X,Y | Relevant Receptors | Local Authority | NO ₂ 2023 | PM ₁₀ 2023 | PM _{2.5} 2023 | NO ₂ 2029 | PM ₁₀ 2029 | PM _{2.5} 2029 | NO ₂ 2031 | PM ₁₀ 2031 | PM _{2.5} 2031 | NO ₂ 2041/2051 * | PM ₁₀ 2041/2051 * | PM _{2.5} 2041/2051 * |
|----------------|--|-----------------|----------------------|-----------------------|------------------------|----------------------|-----------------------|------------------------|----------------------|-----------------------|------------------------|-----------------------------|------------------------------|-------------------------------|
| 505500, 249500 | BTC1, BTC7, BTC9, BTC10, BTC11, BTC12 | Bedford BC | 11.07 | 12.51 | 7.45 | 8.96 | 11.97 | 6.95 | 8.30 | 11.81 | 6.81 | 7.11 | 11.30 | 6.32 |
| 504500, 248500 | BTC2, BTC3, BTC4, BTC5, BTC6 | Bedford BC | 11.03 | 12.55 | 7.47 | 9.36 | 12.00 | 6.98 | 8.82 | 11.85 | 6.84 | 7.79 | 11.33 | 6.33 |
| 504500, 249500 | BTC8, BTC13, BTC14, BTC16, BTC17, BTC18, BTC23, BTC24, BTC25, BTC26, BTC27 | Bedford BC | 10.92 | 12.53 | 7.40 | 9.15 | 11.99 | 6.91 | 8.58 | 11.84 | 6.78 | 7.54 | 11.33 | 6.29 |
| 504500, 250500 | BTC19, BTC20, BTC21, BTC22 | Bedford BC | 10.40 | 12.41 | 7.33 | 8.47 | 11.89 | 6.85 | 7.87 | 11.74 | 6.71 | 6.79 | 11.24 | 6.22 |

Notes

Receptors prefixed 'BTC' are those found within Bedford town centre.

* Background data from Defra¹ do not extend beyond 2040 and so the data for 2041 and 2051 have been assumed to be the same as for 2040.

Table 1-2 - Background Pollutant Information for Ecological Receptors

| Site Name | X,Y | Designation | Vegetation/De position Type | NO _x (µg/m ³) | | | NH ₃ (µg/m ³) | | | N-dep (kg/ha/yr) | | |
|--------------------------------------|----------------|-------------|-----------------------------|--------------------------------------|-------|-------------|--------------------------------------|------|-------------|------------------|-------|-------------|
| | | | | 2023 | 2031 | 2041 / 2051 | 2023 | 2031 | 2041 / 2051 | 2023 | 2031 | 2041 / 2051 |
| Maulden Wood and Pennyfather's Hills | 507500, 238500 | SSSI, AW | Tall | 9.24 | 6.95 | 5.86 | 1.50 | 1.51 | 1.52 | 25.90 | 23.74 | 21.30 |
| Stewartby Lake | 500500, 242500 | CWS | Low | 10.71 | 8.14 | 6.80 | 1.50 | 1.51 | 1.52 | 14.30 | 13.11 | 11.76 |
| Rookery Clay Pit | 501500, 242500 | CWS | Low | 9.78 | 7.73 | 6.60 | 1.50 | 1.51 | 1.52 | 14.20 | 13.01 | 11.68 |
| Quest Pit | 503500, 241500 | CWS | Low | 9.53 | 7.69 | 6.69 | 1.50 | 1.51 | 1.52 | 14.50 | 13.29 | 11.93 |
| Elstow Pit | 504500, 245500 | CWS | Low | 11.61 | 9.48 | 8.36 | 1.60 | 1.61 | 1.62 | 14.50 | 13.29 | 11.93 |
| Kempston Hardwick Pit | 503500, 245500 | CWS | Low | 11.01 | 8.69 | 7.55 | 1.60 | 1.61 | 1.62 | 14.50 | 13.29 | 11.93 |
| Kempston West End | 504500, 247500 | CWS | Tall | 13.83 | 10.58 | 9.04 | 1.70 | 1.71 | 1.72 | 26.30 | 24.10 | 21.63 |

Notes

The X, Y value given represents the area within the Site that is both near to the modelled receptor/transect and close to the road of interest. Where a transect is near to multiple grid squares, professional judgement was used to apply a representative value.

SSSI – Site of Special Scientific Interest, AW – Ancient Woodland, CWS – County Wildlife Site.

Background data for NH₃ and N-dep for the 2021 mid-year were taken from the Air Pollution Information System (APIS)¹. Unlike the Department for Environment Food and Rural Affairs (Defra) background data, the data from APIS require manipulation to predict background concentrations in future years; this was done with reference to the Joint Nature Conservation Committee's Nitrogen Futures publication². For the assessment, the Nitrogen Futures 'business as usual' scenario was adopted whereby NH₃ background concentrations increase by approximately +0.08% year on year and N-dep (which depends on NO_x and NH₃ levels) decreases by approximately -1.04% year on year, up to and including 2040 (to be consistent with Defra background data).

N-Dep – Nitrogen deposition.

¹ UK Centre for Ecology and Hydrology (2024) *Air Pollution Information System (APIS)*. Available at: <https://www.apis.ac.uk/introduction.html> [Accessed: 14 May 2025].

² Joint Nature Conservation Committee (2020) *Nitrogen Futures*. Available at: <https://jncc.gov.uk/our-work/nitrogen-futures/#project-outputs> [Accessed: 14 May 2025].



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