



Preliminary Environmental Information Report

Volume 4 Appendix 6.1

Air Quality Monitoring Methodology

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1 Air Quality Monitoring Method and Locations

- 1.1.1 A six-month nitrogen dioxide (NO₂) diffusion tube survey is being undertaken by Temple for the River Thames Scheme (RTS), at the monitoring locations shown in Plate 1 and Plate 2. The survey commenced in June 2023 and will be completed in early December 2023.
- 1.1.2 Data from a selection of appropriate monitoring locations (installed by the Project team or operated by the relevant Local Planning Authorities (LPAs)) will be used to ‘verify’ the baseline of the air dispersion model, both for the construction and operation phases of the RTS.
- 1.1.3 Model verification refers to checks that are carried out on model performance in relation to road modelling at a local level. Modelled concentrations are compared with the results of local monitoring and, where there is a disparity between modelled and monitored concentrations, an adjustment may be applied to the final model output.
- 1.1.4 At this stage, the roads which will require inclusion in the air dispersion modelling assessment are not yet confirmed. However, indicative routes along which heavy goods vehicles will move excavated materials have been provisionally identified (see Chapter 17 of the Preliminary Environmental Information Report (PEIR): Traffic and Transport). The air dispersion modelling assessment will support the assessment presented within the Environmental Statement (ES).
- 1.1.5 Model verification will be undertaken at locations where air quality impacts can be expected. The indicative routes discussed in 1.1.4 have therefore been used to identify locations at which air quality impacts may be expected and thus at which air quality monitoring should take place. Monitoring along these routes will maximise the number of locations available for model ‘verification’ and adjustment when the ES is produced. Monitoring locations are identified with reference to the indicative routes and the presence of existing LPA monitors.
- 1.1.6 Diffusion tubes are an indicative monitoring method with an uncertainty of approximately $\pm 25\%$. They are tubes containing the chemical reagent triethanolamine (TEA) to absorb the pollutant to be measured from ambient air.

- 1.1.7 The diffusion tubes will be supplied and analysed by Gradko International Limited (Gradko), a UKAS certified laboratory accredited to the AIR Proficiency Testing Scheme. The tubes are prepared with a known volume of 20% TEA in acetone.
- 1.1.8 Tubes have been installed at eight roadside locations on existing street furniture. Triplicate tubes co-located with the Hampton Court Parade roadside automatic monitoring station within Elmbridge Borough Council's (EBC) jurisdiction have also been installed.
- 1.1.9 Each of the monitoring tubes will be installed for a four or five-week period (in accordance with the Defra diffusion tube calendar as far as possible), before being collected and sent back to Gradko for analysis by Ultraviolet-Visible spectrophotometry, which will report the average NO₂ concentration (µg/m³) over the four or five-week period registered for each tube at each location.
- 1.1.10 The monitoring method adopted and proposed monitoring locations were the subject of consultation with EBC, Runnymede Borough Council (RBC), London Borough of Richmond upon Thames (LBRuT), Royal Borough of Kingston upon Thames (RBKuT) and Spelthorne Borough Council (SBC), predominantly being installed at locations where construction traffic routes for the project have been identified.
- 1.1.11 Of the seven individual monitoring locations initially proposed, one monitoring location has been added (DT8) following a recommendation received from SBC (in their email dated 26th May 2023, received via Stantec). The initially proposed co-location at "SCC_ECO" (as it is named by SBC) is no longer proposed due to the possibility of the monitor being decommissioned before the end of the diffusion tube survey period. SCC_ECO is also an 'urban background' monitor and is therefore less representative of the monitoring locations selected, given that these are all considered to be 'roadside' locations. The diffusion tubes are now only co-located with the Hampton Court Parade automatic monitor in triplicate (access and co-location arrangements have been agreed with EBC).
- 1.1.12 The final selected monitoring locations that have been set up and are currently monitoring baseline NO₂ concentrations are as follows:
- DT1 – A308 The Causeway – Lamppost opposite '4 The Causeway' TW18 3AU (502545, 171598): Representative of construction route F

- DT2 – A320 Chertsey Lane - Lamppost located to the north of Ferry Avenue (503468, 170088): Representative of construction route F + G
- DT3 – A320 Staines Road - Road sign located on pavement footpath/cycle path (504041, 168092): Representative of construction route G
- DT4 – Thames Side (North of M3) – Power line post located adjacent to Spelthorne Water Ski Club (505419, 167334): Representative of construction route L
- DT5 – Littleton Lane – Public footpath sign located at the north end of the M3 flyover (505981, 167213): Representative of construction route I
- DT6 – B375 Renfree Way – lamppost located east of Sheep Walk/Renfree Way junction (506967, 166787): Representative of construction route N
- DT7 – Fordbridge Road – lamppost adjacent to ‘Alexander Hire’ building TW16 6AU (509627, 167496): Representative of construction route N
- DT8 – A308 Staines Road West triplicate – Lamppost located north of dual carriageway (507390, 170563)
- Hampton Court Parade triplicate – automatic co-location point located at KT8 9HE (515338, 168292)

1.1.13 One ‘travel blank’ is used as a control for each site visit. As explained in the Local Air Quality Management Technical Guidance (TG22), *“Travel blanks are sent out with the tubes for exposure. They go everywhere the exposed tubes go but are not themselves exposed.”* They are sent to the laboratory for analysis with the exposed tubes to identify possible contamination of diffusion tubes while in transit or in storage by the user.

2 Data Processing Methodology

2.1.1 The following method will be used to process monitoring data collected from the survey:

- a) The time-weighted average at each monitoring location will be calculated if the tube collection date is not synchronised with the diffusion tube calendar, and the results from the co-located triplicate monitoring location averaged;
- b) Monitoring data will be ‘annualised’ in accordance with TG22, which outlines a method for converting shorter monitoring periods to an

equivalent annual mean concentration by calculating a factor representing the proportion of the period mean to the annual mean and multiplying the monitored data by the calculated factor. Annualisation will be undertaken using the 2019 or 2022 data (the year to be determined depending on the year ultimately selected for model verification and adjustment) at four nearby urban background monitoring locations. The locations will be selected from the London Air website or Defra's Automatic Urban and Rural Network website; and,

- c) As diffusion tubes are an indicative monitoring technique, they do not offer the same accuracy as an automatic chemiluminescent analyser, which could lead to results under- or over-reading (leading to negative or positive bias). To reduce bias, the local bias adjustment factor for 2022 will be applied to the annualised averaged monitoring results located at roadside locations.

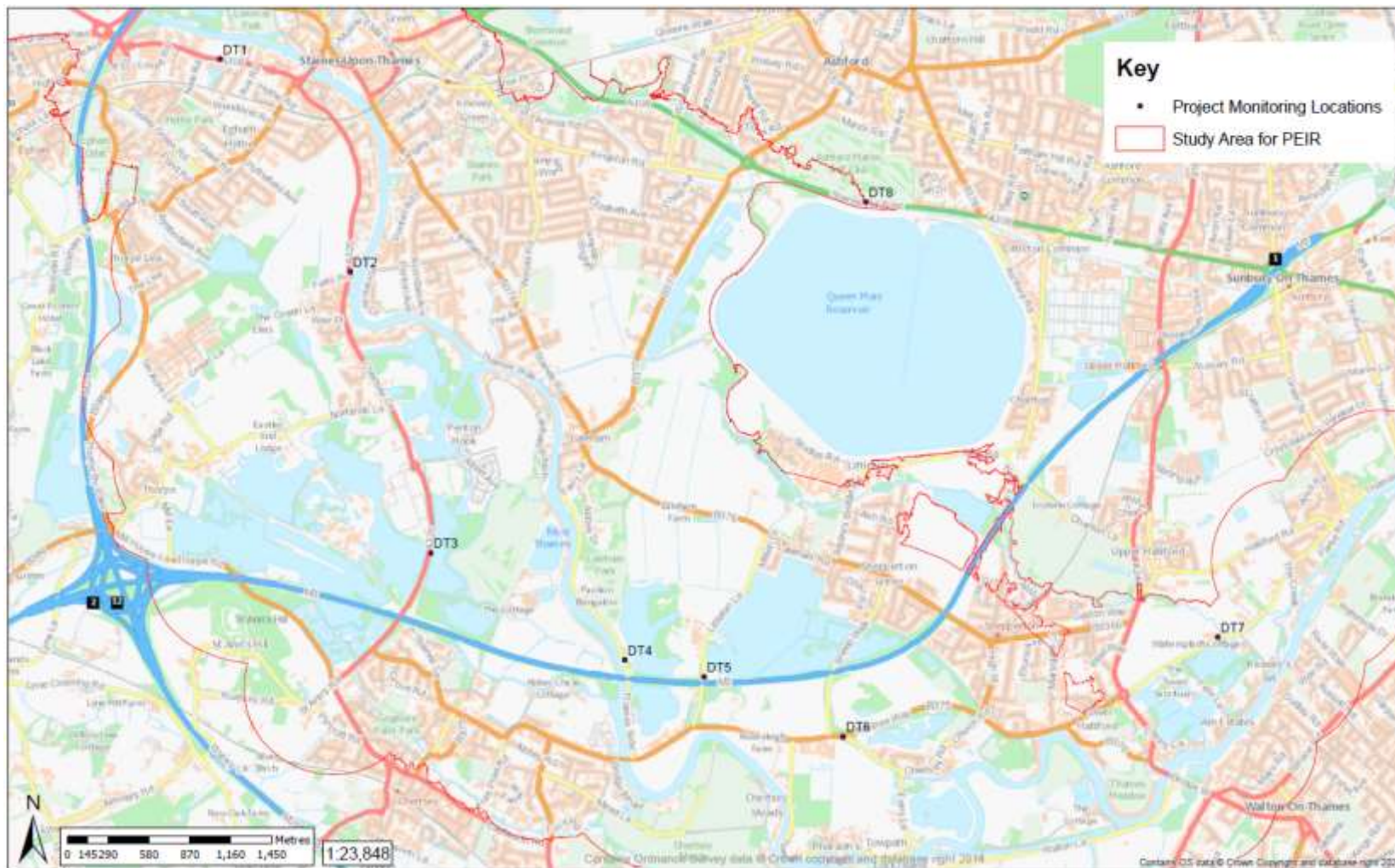


Plate 1– Map of Diffusion Tube Monitoring Locations

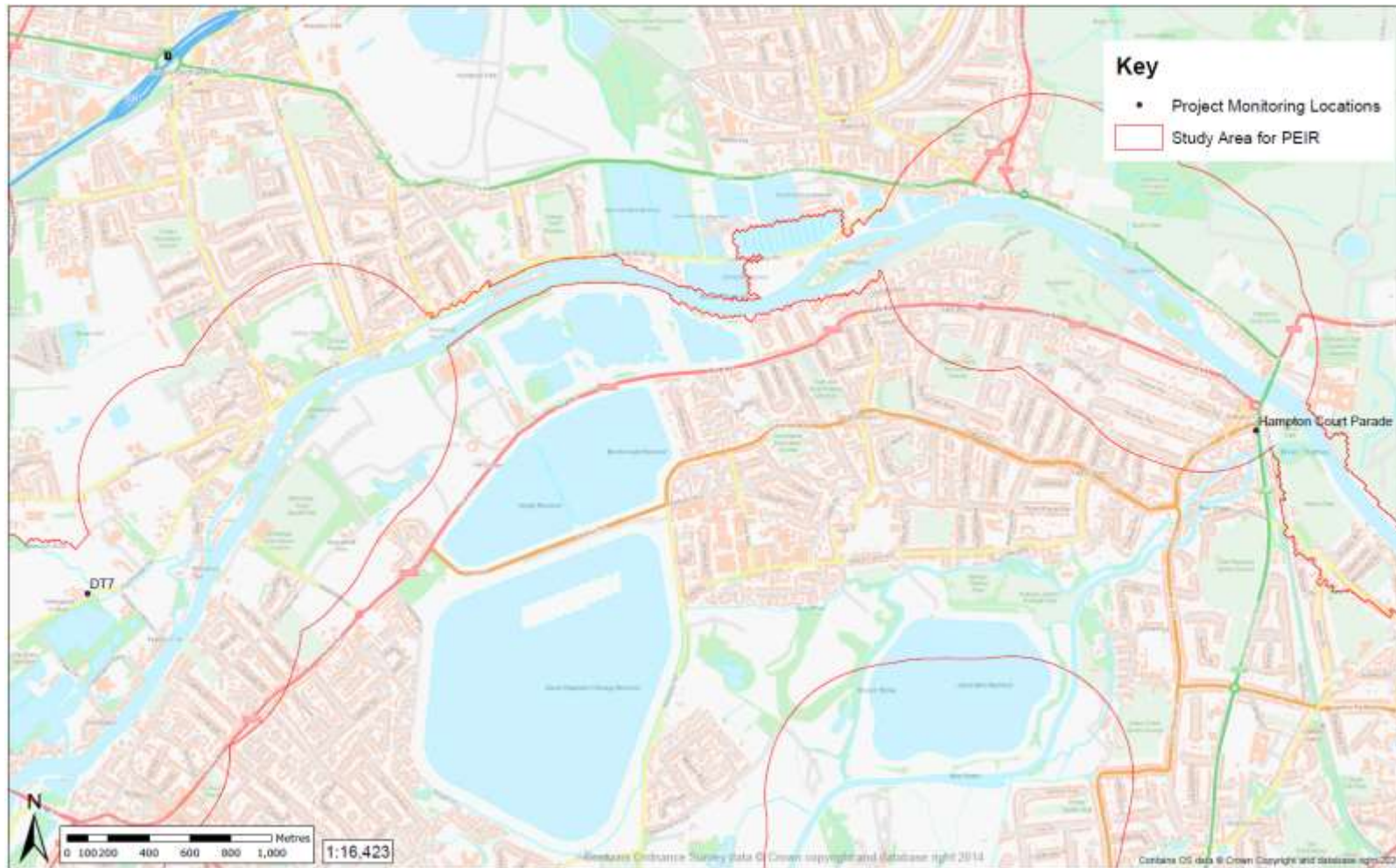
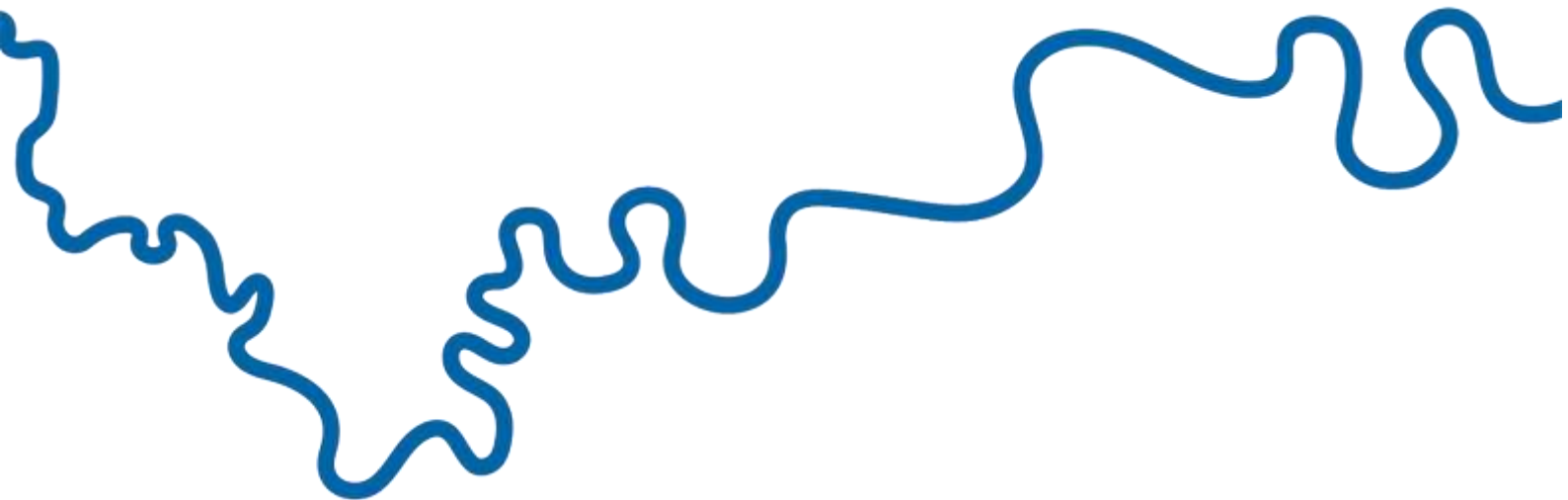


Plate 2– Map of Hampton Court Parade Automatic Monitoring Location



The River Thames Scheme represents a new landscape-based approach to creating healthier, more resilient and more sustainable communities by reducing the risk of flooding and creating high quality natural environments.