



Calderdale Council

**CALDERDALE LOCAL PLAN
EXAMINATION MATTER 8 GROWTH,
DELIVERY, INFRASTRUCTURE AND
VIABILITY**

Air Quality Assessment-Supplementary
Information



Calderdale Council

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Air Quality Assessment-Supplementary Information

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CALDERDALE LOCAL PLAN EXAMINATION MATTER 8 GROWTH, DELIVERY, INFRASTRUCTURE AND VIABILITY

Air Quality Assessment-Supplementary Information

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1. INTRODUCTION

1.1.1. During the Calderdale Metropolitan Borough Council ('Council') new Local Plan¹ ("Local Plan") Stage 2 examination hearing on the 7th October 2020, the Inspector expressed concern as to the veracity of the air quality evidence base. As a result, the Inspector² expressed a requirement for the Council to submit additional examination information to:

"look at cumulative impacts on a range of locations/receptors in the borough and not solely on AQMAs."

1.1.2. In response, the Council commissioned an air quality assessment to further investigate the potential impacts associated with the Local Plan at locations across the borough. This was submitted prior to the Stage 3 hearings on the 1st April 2021 and was subsequently updated as final on the 9th April 2021³.

1.1.3. This report provides further information relating to air quality after the 14-day consultation period which commenced on the 1st April 2021. It provides responses to public comments provided on the report and a specific technical peer review commissioned by the Clifton Village Neighbourhood Forum. It also includes a peer review of the outline planning application for Land East of Brighouse Road in Hipperholme, Halifax (LP0032), which is an allocation represented in the draft Local Plan.

1.1.4. The report is divided into four distinct sections as follows:

- Section 2 – Differences Between Submitted Report Drafts
- Section 3 – Response to Comments on CC132-Calderdale Local Plan Air Quality Assessment
- Section 4 – Response to Peer Review Commissioned by the Clifton Village Neighbourhood Forum
- Section 5 – Peer review of Crosslee Application, Hipperholme

1.1.5. It is supported by the following technical appendices:

- Appendix A – Road-NO_x Adjustment Factors
- Appendix B – Supplementary Local Results
- Appendix C – Monitoring Data

¹ Calderdale Metropolitan Borough Council (2018). Calderdale Council Local Plan Publication Draft (August 2018) [Examination library reference: **SD 01.1a**]

² Stage 2 examination of the Calderdale Local Plan Matter 8 Growth delivery, infrastructure and viability. Inspectors Post-Hearing Questions. [Examination library reference: **INS18**]

³ WSP 2021. Calderdale Local Plan Examination Matter 8 Growth, Delivery, Infrastructure and Viability. Air Quality Assessment. 9th April 2021.

2. DIFFERENCES BETWEEN SUBMITTED REPORT DRAFTS

2.1. CC132 Update

- 2.1.1. On the 3rd June 2021, the Council provided communication on the issue of changes to document CC132 during the 14-day consultation period which began on the 1st April 2021. The communication is as follows:

“The changes to CC132 were a result of the document moving from its draft to final version. The draft and final versions of CC132 followed one another in close succession and the Council was keen to put it into the public realm as soon as possible and then to update them when the final version became available. We recognise though that the version history should have been made clear on the Examination webpage because this has caused unnecessary confusion, and we therefore apologise for this. Although the Council does not consider that the changes between the draft and final versions of CC132 were substantive, in the interests of transparency, the Council will run an additional period for representations to be submitted on document CC132 and accompanying CC132a. Considering air quality is not part of the agenda at the Stage 3 Hearings the Council will hold the additional 14 day consultation once these hearings have closed. This will allow participants to prepare and focus on the forthcoming matters. The Council will also publish a note produced by consultants WSP which will set out the changes between the two documents and the reason for these changes.”

- 2.1.2. This section provides a summary of differences between the submitted reports and comment as to the reasons for the updates and implications for the air quality impact assessment. This exercise is summarised in **Table 2-1**.

Table 2-1 – Summary of differences between submitted report drafts

| Paragraph reference | First version | Latest version | Comment |
|---------------------|---|---|---|
| 3.3.4 | Whilst 2030 projections maintain the westward pattern of increasing NO _x /NO ₂ and higher localised concentrations, a substantial reduction of background NO _x /NO ₂ concentrations is predicted over the next 10 years, with a maximum reduction of approximately 12-15µg/m ³ by 2030 | Whilst 2030 projections maintain the eastward pattern of increasing NO _x /NO ₂ and higher localised concentrations, a substantial reduction of background NO _x /NO ₂ concentrations is predicted over the next 10 years, with a maximum reduction in NO₂ of approximately 8µg/m³ by 2030 | Typographical errors corrected during proofing review. |
| 3.3.4 | PM ₁₀ – A clear reduction in background PM ₁₀ concentrations is observed between 2019 and 2030 projections. This is particularly evident in localised zones such as Halifax, Brighouse, and Elland with a maximum reduction of approximately 2 µg/m³ by 2030. | PM ₁₀ – A clear reduction in background PM ₁₀ concentrations is observed between 2019 and 2030 projections. This is particularly evident in localised zones such as Halifax, Brighouse, and Elland. | The text was amended slightly to reflect the alignment of the background maps with the assessment year during proofing. |
| 3.5.2 | The traffic reliability area covers those areas that are likely to be sensitive to changes in air quality is therefore appropriate for the air quality assessment. | The traffic network modelled covers those areas potentially sensitive to changes in ambient air quality, where the traffic predictions are considered to be most reliable and is therefore appropriate for the air quality assessment. | Traffic data were used where appropriate for a strategic review of air quality and it was not intended to represent microscale assessment of junctions. This level of detail will be assessed at the detailed planning stage. |
| 3.6.4 | The impact on air quality at all receptors within 4m of the ARN was therefore assessed. It should be noted therefore that the maximum predictions and impacts are predicted at the roadside, which is not necessarily where long-term exposure will occur. The focus of the impact assessment is therefore on roadside compliance. | The impact on air quality at all receptors within 4m of the ARN was therefore assessed as representative of receptors within the 200m envelope used to define the ARN in DMRB LA105. It should be noted therefore that the maximum predictions and impacts are predicted at the roadside, which is not necessarily where long-term exposure will occur. Where roadside compliance at 4m is achieved, it can | The text was expanded to provide greater depth of explanation for the non-expert reader. Predictions were made at receptors at 4m from the roadside within the 200m corridor surrounding the ARN. This provided a practical model with sensible run times which is consistent with compliance reporting under the ambient air quality EU Directive. To predict region wide receptors would |

| Paragraph reference | First version | Latest version | Comment |
|---------------------|---------------|--|---|
| | | be assumed that compliance is achieved elsewhere in the 200m envelope as pollutant concentrations fall with distance from the roadside. | have required tens of thousands of receptor predictions which would not have been practical in the time available. |
| 3.7.13 | | Some areas of Kirklees and Bradford are not represented in enough detail in the transport model to apply specific development growth. Furthermore, Figure 3.2 of the Calderdale Strategic Transport Model Local Validation Report shows the focus of transport model calibration count sites is the urban areas of eastern Calderdale namely Halifax, Elland, and Brighouse. It can therefore be expected that transport model accuracy is lower on feeder roads leading into Calderdale at the margins of the study area which are outside of the borough. Of particular note are the locations along Tong Street to the south-east of Bradford and along a section of the M62 approximately 1,345m north-east of Chainbar Roundabout. Traffic flows are predicted to increase on Tong Street and the M62 by 23.1% and 37.5% respectively, from the Do Minimum to the Do Something With Local Plan scenarios. This includes increases in HDV traffic flows along Tong Street and the M62 of 72.4% and 69.2% respectively. As such increases yield non-representative results, the reporting of predicted concentration maxima in Section 4.2 Regional Results and the magnitude of increase therefore includes predictions made inside Calderdale only. | <p>The text was added to provide explanation as to the validity and derivation of the traffic data. The Calderdale Strategic Transport Model (CSTM) is strategic in that it is intended to provide regional scale detail focussing on urban areas. The Local Validation Report shows the calibration counts and it should be noted that the traffic model outside Calderdale does not and is not intended to represent the detailed redistribution of traffic.</p> <p>In consultation with the Transport Planners, it was concluded that the reporting of quantified air quality results would be undertaken for Calderdale only. Qualitative reference to air quality is therefore made to areas outside Calderdale.</p> |

| Paragraph reference | First version | Latest version | Comment |
|-------------------------------|--|---|---|
| 4.2.3 | <p>For key pollutant NO₂, 13 exceedances are predicted in the study area but these are outside Calderdale south-east of Bradford and as shown in Figure 6-11. There are no exceedances in Calderdale. The maximum improvement in air quality (1.8µg/m³) will be lower than the maximum deterioration (24.7µg/m³). The maximum deterioration in NO₂ of 24.7µg/m³ is located outside Calderdale south-east of Bradford.</p> | <p>For key pollutant NO₂, 12 exceedances are predicted in the study area but these are outside Calderdale south-east of Bradford on Tong Street and on the M62 north-east of Cleckheaton as shown in Figure 6-11 and Figure 6-12.</p> <p>The exceedances north-east of Cleckheaton exist in the Do Something Without Local Plan scenario and There are no exceedances in Calderdale. The maximum improvement in air quality (1.8µg/m³) will be lower than the maximum deterioration (12.6µg/m³).</p> <p>The maximum deterioration in NO₂ of 12.6µg/m³ is located on the outskirts of Calderdale, at the eastern boundary, along Cooper Bridge Road.</p> | <p>This was reduced from 13 to 12 receptors as a result of a simple proofing error.</p> <p>Such is the design of the CSTM, predictions made in Bradford are not intended to be representative of the microscale and detailed redistribution of traffic or relevant to the Local Plan so these were removed.</p> |
| Footnote to Table 4-1 and 4-5 | | <p>*The reported maximum improvement and worsening outside Calderdale are excluded due to the lack of reliability in the traffic data (see Limitations and Assumptions).</p> | See response to paragraph 4.2.3. |
| 4.2.12 | <p>For key pollutant NO₂, 13 exceedances are predicted in the study area but these remain outside Calderdale in south-west Bradford as shown in Figure 6-11. There are no exceedances in Calderdale with the addition of traffic from the Local Plan.</p> <p>The maximum improvement in air quality (1.7µg/m³) will be lower than the maximum deterioration (25.9µg/m³). The maximum deterioration in NO₂ of</p> | <p>For key pollutant NO₂, Figure 6-13 shows 12 exceedances are predicted in the study area but these remain outside Calderdale in south-west Bradford</p> <p>There are no new exceedances inside or outside Calderdale with the addition of traffic from the Local Plan. The maximum improvement in air quality (1.7µg/m³) will be lower than the maximum deterioration (13.2µg/m³).</p> | See response to paragraph 4.2.3. |

| Paragraph reference | First version | Latest version | Comment |
|---------------------|---|---|--|
| | 25.9µg/m ³ is located outside Calderdale in south-west Bradford. | The maximum deterioration in NO ₂ of 13.2µg/m ³ is located on the outskirts of Calderdale, near the eastern boundary, along Cooper Bridge Road. | |
| Table 4-6 | 13 substantial NO ₂ impacts | 12 substantial NO ₂ impacts | See response to paragraph 4.2.3. |
| Table 4-7 | >4 increase 207 properties | >4 increase 206 properties | See response to paragraph 4.2.3. |
| 4.2.18 | Table 4-8 shows that there are 13 receptors where the NO ₂ concentration worsens in locations already exceeding the objective. With the Local Plan no new receptors are predicted to have a worse PM ₁₀ concentration than the one already in exceedance. There is no difference to the number of receptors exceeding the objective where NO ₂ and PM ₁₀ is predicted to worsen as a result of the inclusion of Local Plan traffic. | Table 4-8 shows that there are 12 receptors where the NO ₂ concentration worsens in locations already exceeding the objective. In comparison to Table 4-4, this shows that the Local Plan produces no new significant NO ₂ effects. With the Local Plan no new receptors are predicted to have a worse PM ₁₀ concentration than the one already in exceedance. There is no difference to the number of receptors exceeding the objective where NO ₂ and PM ₁₀ is predicted to worsen as a result of the inclusion of Local Plan traffic. | See response to paragraph 4.2.3. Whilst both the Draft and Final versions show that the Local Plan produces no new significant NO ₂ effects, this statement was added into the final version to provide further clarity. |
| 4.2.20 | | The Local Plan will increase the magnitude of deteriorations due to increases in traffic as shown by the positive difference in NO ₂ concentration between the with and without Local Plan results shown in Figure 6-16. However, the Local Plan it is not predicted to cause any new objective exceedances anywhere in the study area that do not already exist as a result of traffic from the Kirklees and Bradford local plans. | While the addition of Local Plan traffic in most areas will make air quality worse in some areas in comparison to the 2032 Do-Minimum scenario (including the Bradford and Kirklees Local Plans) it will not stop the overall improvement in air quality in comparison to 2019 driven by improvements in emissions technologies and uptake of electric vehicles. |

| Paragraph reference | First version | Latest version | Comment |
|---------------------|--|---|--|
| 4.2.21 | <p>For key pollutant NO₂, 13 exceedances are predicted in the study area outside Calderdale in southwest Bradford as shown in Figure 6-11. There are no exceedances in Calderdale with the addition of traffic from the Local Plan.</p> <p>As these predictions are made alongside road links at the margins of the Calderdale Strategic Transport Model, confidence in the accuracy of the traffic flows is lower in this location than inside Calderdale for the reasons described in the Limitations and Assumptions section.</p> | <p>For key pollutant NO₂, 12 exceedances are predicted in the study area but these are outside Calderdale in south-east Bradford and north-east of Cleckheaton as shown in Figure 6-11.</p> <p>There are no new exceedances in Calderdale with the addition of traffic from the Local Plan. As the predicted exceedances are made alongside road links at the margins of the Calderdale Strategic Transport Model, confidence in the accuracy of the predictions is lower in these locations than inside Calderdale for the reasons described in the Limitations and Assumptions section.</p> | See response to paragraph 4.2.3. |
| 4.3.4 | <p>Table 4-9 shows that in all AQMAs, compliance with the annual mean objective will be achieved without the Local Plan. The highest predictions in 2032 are in the Brighouse AQMA where 35.0µg/m³ is predicted without the Local Plan (Appendix C, Table C-1 and Plate C-25). In consideration of the maximum error in the model of +3.87µg/m³, and the roadside position of this receptor point, exceedances in the Brighouse area at residential receptors are unlikely. The Local Plan is predicted to reduce the concentration in Brighouse as traffic is diverted away from the town as a result of the Clifton and Rastrick Garden Suburb developments.</p> | <p>Table 4-9 shows that in all AQMAs, compliance with the annual mean objective will be achieved without the Local Plan. The highest predictions in 2032 are in the Brighouse AQMA where 35.0µg/m³ is predicted without the Local Plan (Appendix C, Table C-1 and Plate C-25). In consideration of the maximum error in the model of +3.87µg/m³, and the roadside position of this receptor point, exceedances in Brighouse at residential receptors are unlikely. The Local Plan is predicted to reduce the maximum annual mean concentration in Brighouse by 0.8µg/m³, however, this is accompanied by an equal increase (0.8µg/m³) in the average annual mean concentration predicted in wider the area (Table 4-12). These small changes in predicted concentrations are a function of general increases in traffic flow and variations in local traffic</p> | <p>Updated following consultation with Transport Consultants.</p> <p>The RMSE of 3.87µg/m³ means that the air quality model validates within 10% of the annual mean objective as recommended in Defra LAQM.TG(16) at paragraph 7.541.</p> |

| Paragraph reference | First version | Latest version | Comment |
|---------------------|---|---|---|
| | | redistribution as a result of the Clifton and Rastrick Garden Suburb developments. | |
| Table 4.11 | Data for all Calderdale AQMSs presented | Only the information for Brighouse is presented | All local result tables were updated in this way to increase the clarity of the results. Full details on all local AQMA predictions available in Appendix C. |
| 4.3.12 | Brighouse and neighbouring Clifton, which are subject to increased traffic flows from the proposed garden suburbs, are the locations at which the highest NO ₂ , PM ₁₀ and PM _{2.5} predictions are made. Although the Local plan modelling results indicate compliance with all statutory objectives in 2032, a specific planning application to develop these sites for housing would require a detailed impact assessment based on locally verified traffic data completed in accordance with the WYLES Air Quality & Emissions Technical Planning Guidance to ensure that appropriate mitigation to protect human health is secured. | <p>The local NO₂ results for the red and amber constrained areas are summarised in Table 4-12 with cross reference to the Plates in Appendix C – Supplementary Local Results.</p> <p>(Table 4-12 – Local Results Summary (NO₂) added.)</p> | During proofing, all local result tables were updated to increase the clarity of the results. Full details on all local AQMA predictions available in CC132 Appendix C. |
| 4.3.13 | | <p>Table 4-12 shows the variability in model predictions on a local level.</p> <p>Maximum NO₂ concentrations above 30.0µg/m³ are predicted in the following four locations:</p> <ul style="list-style-type: none"> ▪ Halifax (36.4µg/m³) along Ovenden Road joining the Orange Street Roundabout ▪ Calderdale AQMA No.6 Brighouse (34.2µg/m³) on Huddersfield Road at the A641/A643/A644 junction | The addition of explanatory text to improve the clarity of the results. |

| Paragraph reference | First version | Latest version | Comment |
|---------------------|---------------|---|---|
| | | <ul style="list-style-type: none"> ▪ Ainley Top (32.6µg/m³) along Ainley Top Roundabout ▪ Clifton (31.1µg/m³) along the M62/A644 Roundabout. | |
| 4.3.14 | | <p>The maximum predicted NO₂ concentration of 36.4µg/m³ occurs in Halifax within 200m of the constrained junction at Orange Street Roundabout (A58/A629). Whilst the maximum concentration falls within 10% of the NO₂ annual mean objective, it is not an exceedance and represents the worst-case concentration out of 424 roadside receptors within 200m of the junction. It is not a location at which long term human exposure will occur.</p> <p>The mean average annual concentration across these 424 receptors is 19.0µg/m³, which is under half the 40.0µg/m³ objective.</p> | The addition of explanatory text to improve the clarity of the results. |
| 4.3.15 | | <p>The Local Plan is predicted to cause deteriorations in NO₂ concentrations above 4.0µg/m³ broadly corresponding with those areas where the above maxima are predicted</p> <ul style="list-style-type: none"> ▪ Halifax (Plate C-29) along Ovenden Road at the Orange Street Roundabout (~ 310m west of AQMA No. 8 New Bank) representing a maximum increase of 10.4µg/m³ in Halifax. ▪ AQMA No.6 Brighouse (Plate C-25) on Huddersfield Road at the A641/A643/A644 junction, representing a maximum increase of 8.4µg/m³ in Brighouse. | The addition of explanatory text to improve the clarity of the results. |

| Paragraph reference | First version | Latest version | Comment |
|---------------------|--|--|---|
| | | <ul style="list-style-type: none"> ▪ Ainley Top (Plate C-15) along Ainley Top Roundabout, representing a maximum increase of 10.2µg/m³ in Ainley Top, and the surrounding areas of Elland and Westvale. ▪ Clifton (Plate C-20) along the M62/A644 Roundabout (~ 1,200m east-southeast of Brighouse AQMA), representing a maximum increase of 7.4µg/m³ for Clifton. <p>Even with these increases, the maximum and annual mean predicted concentrations are under the objective for the four identified locations with the contribution to local traffic from the Local Plan including that from the proposed Clifton and Rastrick Garden Suburb developments. There is no long-term human exposure where these roadside maxima are predicted to occur and by inference no exceedances will occur anywhere within a 200m envelope.</p> | |
| 4.4.2 | <p>A total of 318 model links mapped on to 36 Defra PCM Compliance IDs. Of these, all 318 are predicted to experience Do-Something concentrations in excess of the PCM equivalent predicted Do-Something concentration. Whilst all of the Do-Something concentrations are below the limit value for NO₂ of 40 µg/m³, the fact that the Do-Something concentrations are above the PCM equivalent Do-Something concentration suggests that achieving compliance could be slowed by the traffic contribution from the Local Plan.</p> | <p>A total of 318 model links mapped on to 36 of the Defra PCM Compliance links. All 318 links are predicted to experience Do-Something concentrations in excess of the PCM equivalent predicted Do-Something concentration. Whilst all of the Do-Something concentrations are below the limit value for NO₂ of 40 µg/m³, the fact that the predicted Do-Something concentrations are above the concentrations at the Defra PCM Compliance links where they overlap, suggests that achieving compliance with the EU limit value could be slowed by the traffic contribution from the Local Plan.</p> | <p>The Council wish to clarify that the modelling results representing the Local Plan in 2032 do not indicate an exceedance of the 40 µg/m³ objective in either the 2032 Do-Minimum (Bradford and Kirklees) or 2032 Do-Something (Local Plan) scenarios. Considering that full build out (2032) is assumed in assessing projected compliance years 2025 and 2030 there is no realistic probability of delay to compliance. However, further improvements in air quality beyond compliance would be slowed.</p> |



2.2. Summary

- 2.2.1. As the air quality impact assessment is highly technical in nature, one requirement of the internal proof-reading process is to ensure the reported material can be understood by an informed but non-expert reader.
- 2.2.2. **Table 2-1** shows that the majority of text changes were made to increase the clarity and readability of the results to make the text more accessible. However, one technical change was made (paragraph 4.2.3) after upload of the first draft due to a proofing error.
- 2.2.3. It should be noted that traffic flows for roads leading into Calderdale are outside the reliability area of the CSTM. Traffic flows for major roads leading into Calderdale are intended to be 'feeder' roads bringing traffic into the borough and are not validated by traffic counts. For this reason, the flows lack micro-scale detail and human exposures outside Calderdale are outside the brief for assessing impacts of the Local plan.
- 2.2.4. We therefore conclude that the changes between the submitted drafts are non-substantive and do not change the conclusions of the impact assessment work.



3. RESPONSE TO COMMENTS ON CC132 – CALDERDALE LOCAL PLAN AIR QUALITY ASSESSMENT REPORT

3.1. Comment Themes

- 3.1.1. On the 1st April 2021, the Council submitted document CC132 in response to a requirement from the Inspector for the Council to *'look at cumulative impacts on a range of locations/receptors in the borough and not solely on AQMAs.'*
- 3.1.2. This section provides a summary of key comment themes received during the consultation and further information to inform the public examination process. All responses are made with respect to document CC132 uploaded to the examination library on the 9th April 2021 and are summarised in **Table 3-1**.

Table 3-1 – Response to Comments on CC132 – Calderdale Local Plan Air Quality Assessment Report

| Comment Theme | Council response |
|---|---|
| <p>Risk to Air Quality in West Vale has not been addressed or evidenced as safe, particularly regarding the impacts of new homes near Saddleworth Road, on West Vale traffic lights, and general congestion and air pollution near West Vale schools.</p> <p>Proportionate evidence in terms of traffic and air quality modelling and monitoring is not presented for West Vale</p> | <p>As part of its statutory obligation to review and assess local air quality, the Council operates two air quality monitors in West Vale. The monitors are located on Stainland Road outside Edkins & Holmes Estate Agents (ID WV-SR1) and Café Thai Restaurant and Bar (ID WV-SR2). The latest (2019) reported results for annual mean NO₂ are 38.2 µg/m³ (ID WV-SR1) and 28.0 µg/m³ (ID WV-SR2). Monitored concentrations in 2019 were under the 40ug/m³ statutory objective and both have been subject to a slight falling trend in the period 2017-2019.</p> <p>Emissions from Saddleworth Road were screened out of the affected road network on the basis that traffic flows did not meet the screening criteria for assessment. However, such is the local concern in this area of Halifax the Council has completed supplementary assessment work which is reported in Section 3.2.</p> |
| <p>Copy error on pages 94 - 95 in the monitoring presented for Hebden Bridge, Luddendenfoot and Sowerby Bridge AQMA.</p> | <p>The copy error is acknowledged, and the full, updated set of monitoring data is presented in Appendix C for Hebden Bridge (Plate C-1), Luddendenfoot (Plate C-2), Sowerby Bridge (Plate C-3) and West Vale (Plate C-4).</p> |
| <p>Limitations and assumptions underpin the conclusions of the report.</p> | <p>Modelling assessments are subject to assumptions and limitations because they are a representation of reality based on the best available datasets and predictive tools. It is good practice to acknowledge the limitations and assumptions of such an assessment as shown in CC132 Section 3.7. To mitigate the limitations in the underlying datasets, a process of model adjustment and verification is completed as described in Appendix B of CC132. Additional information regarding the requirement to apply professional judgement is provided Section 4.3 and Section 4.8.</p> |
| <p>Conclusions are drawn based on Professional Judgement and are not evidence based.</p> | <p>The conclusions drawn from the assessment work are based on a modelling assessment incorporating modelled traffic, meteorological and monitoring data and in this regard are evidence based. However, as described in Paragraph 3.7.10 and 3.7.11 of CC132, this uncertainty is minimised as far as is possible. Professional judgement has to be applied to the modelling process and interpretation of the results to draw meaningful conclusions and report CC132 is entirely transparent in this regard. The application of professional judgement is described in CC132 Section 4.3 and Section 4.8.</p> |

| Comment Theme | Council response |
|--|--|
| Concern around level of accuracy. | <p>Strategic level air quality models are intended to represent traffic flows based on regional demands produced by specific allocation areas. As such they are not intended to reproduce fine local detail which is possible from other types of transport model specifically designed for that purpose. This is appropriate for a strategic level Local Plan assessment.</p> <p>The air quality assessment was required to balance the need to produce a practical borough wide study area with the detail required to assess air quality impacts at specific locations across the borough. Traffic data screening, the use of 4m roadside receptors and a limit to model input datasets were compromises made to achieve this. Despite these limitations, model verification shows that the Root Mean Square Error (RMSE) values are within $4\mu\text{g}/\text{m}^3$ as recommended in paragraph 7.541 on the Defra LAQM.TG(16) guidance.</p> <p>We do note that monitoring locations in West Vale were not used in our model verification process. The model for West Vale, Brighouse and Clifton has been therefore been refined to produce specific verification factors for these areas using all available and valid monitoring data and the updated results are show in Section 3.2.</p> |
| Table B.2 – Data Used in Model Verification shows that no data exists for West Vale. No evidence has been presented for West Vale. | Monitoring results for diffusion tubes in West Vale are shown in Plate C-9 . The tubes are located at the roadside on Stainland Road outside Edkin and Holmes Estate Agents and the Cafe Thai Restaurant and Bar close to the Stainland Road (B6112)/Saddleworth Road (B6114) junction. In 2019, diffusion tube WV-SR1 recorded $38.2\mu\text{g}/\text{m}^3$ and WV-SR2 $28.0\mu\text{g}/\text{m}^3$. Although at the roadside, both tubes are under the annual mean objective of $40\mu\text{g}/\text{m}^3$. It can be expected that pollutant concentrations will be lower with greater distance from the roadside as road traffic pollution disperses. |
| Clarity on mitigation measures provided within Calderdale’s LAQM Annual Status Report (applicable to the AQMAs) to be applied as part of the local plan. | Mitigation measures and management techniques proposed for AQMAs within the Calderdale Annual Status Reports are updated annually. The requirement for the intensification or introduction of new measures are based on a number of factors including annual air quality monitoring results and the provision of funding. Specific planning applications will be subject to their own detailed air quality impact assessments for which the requirement for mitigation will be determined in accordance with the WYLES Air Quality & Emissions Technical Planning Guidance. |
| Consideration of fluctuations in through traffic, cross-boundary growth and the impact of peak hours and weather conditions on the | A full description of the methodology applied to the air quality assessment is provided in CC132 Section 3 Scope and Methodology. The methodology briefly comprises: |

| Comment Theme | Council response |
|--|--|
| <p>concentration of pollutants and their dispersal times.</p> | <ul style="list-style-type: none"> ▪ The CSTM considers growth from Bradford and Kirklees and their contribution has been explicitly modelled without the contribution from the Local Plan. These results are shown in CC132 Section 4 Table 4.1 to Table 4.4. ▪ As a strategic level assessment into the impacts of the Local Plan, annual averages are the focus of the assessment. Peaks in emissions are represented by the use of diurnal traffic profiles applied the annual average daily traffic (see Section 4.2) ▪ Hourly meteorological data obtained from Emley Moor weather station was used to predict pollutant concentrations. |
| <p>Consideration of additional receptors along suburban or new roads branching into main routes (such as the A641 / A644) within Calderdale.</p> | <p>Strategic level air quality models represent traffic flows based on regional demands and are not intended to reproduce fine local detail which is possible from other types of transport model specifically designed for that purpose. Additional receptors would be assessed in detailed assessments for planning applications impacting receptors on the A641 and A644 to be completed in accordance with the WYLES Air Quality & Emissions Technical Planning Guidance and the EPUK/IAQM guidance.</p> |
| <p>Particulate matter and the absence of monitoring in Greetland and Stainland</p> | <p>Particulates are not currently monitored in Greetland and Stainland because the risk of exceedance of the existing national air quality objectives for PM₁₀ and PM_{2.5} is low.</p> <p>Supplementary works focussing on West Vale and encompassing Saddleworth Road and Stainland Road is described in Section 3.2.</p> <p>The Defra emissions factors toolkit includes a contribution from brake and tyre wear. It is noted that in future years, particulate emissions estimates do not display a consistent reducing trend in the same way as NO₂ in part because of the contribution from this source.</p> |
| <p>Crosslee outline planning application</p> | <p>See Section 5.</p> |

3.2. Supplementary Works

- 3.2.1. West Vale, Brighouse and Clifton are areas of concern identified in a large number of comments on document CC132. As a result, the Council has completed a review of the air quality model in these areas. Supplementary analysis of air quality in West Vale, Brighouse and Clifton is presented in this section.

MODEL REFINEMENTS

- 3.2.2. Model review and minor model refinements have been completed in West Vale, and the neighbouring areas of Brighouse and Clifton to provide reassurance as to the accuracy of the results presented in CC132. The review and refinements can be summarised as follows:
- All roads with traffic data provided for West Vale and Clifton were included in a model update without the screening of traffic data. This means that emissions from all road links were included in the updated assessment even if the traffic flows were very low. As some new road links were introduced the number of assessed receptors increased in the updated models.
 - In CC132, model predictions in West Vale were uplifted based on an adjustment factor derived for a larger verification zone but not including the tubes in West Vale. In the supplementary works, a specific adjustment factor was derived for West Vale using NO₂ monitoring data (2019) collected from diffusion tube WV-SR1 (38.2 µg/m³) positioned on Stainland Road outside Edkin and Holmes Estate Agents. The other diffusion tube in West Vale WV-SR2 (28.0µg/m³) positioned outside the Cafe Thai Restaurant and Bar was not used to produce a higher adjustment factor. The refined model adjustment factor was **4.7** (Zone 4c) in comparison to **1.1** for Zone 4 in the original assessment. The resulting RMSE for Zone 4c was **0.04** µg/m³ compared to **3.76** µg/m³ in CC132 which indicates that the larger adjustment factor is more appropriate for West Vale.
 - In CC132, model predictions in Brighouse and Clifton were uplifted based on an adjustment factor derived from the verification zone encompassing the neighbouring areas of Brighouse and Clifton. In the supplementary works, the same verification zone was maintained for Clifton, and following model verification based on updated results from the refined model, the adjustment factor and RMSE remained similar to that determined for the original assessment. The refined model adjustment factor remained at **2.3** (Zone 5), with a resulting RMSE of **3.5** µg/m³, slightly reduced from **3.6** µg/m³.
- 3.2.3. The assessed road networks and results are shown in **Appendix B Figure B.1** and, **Figure B.2** (West Vale), and **Figure B.3** and **Figure B.4** (Brighouse and Clifton).

SUPPLEMENTARY RESULTS

- 3.2.4. **Table 3-2** presents the maximum predicted annual mean concentrations at individual receptors within West Vale, Brighouse and Clifton. Annual mean concentrations averaged across all roadside receptors within West Vale, Brighouse and Clifton are also presented.

Table 3-2 – Local Annual Mean Concentrations ($\mu\text{g}/\text{m}^3$) (supplementary results)

| Location | Maximum Annual Mean Concentration (2032) | | | Average Annual Mean Concentration (2032) | | |
|---|--|-----------------|--------|--|-----------------|--------|
| | Without Local Plan | With Local Plan | Impact | Without Local Plan | With Local Plan | Impact |
| Nitrogen dioxide (NO_2) (objective = $40 \mu\text{g}/\text{m}^3$) | | | | | | |
| West Vale | 22.6 | 23.4 | 0.8 | 11.5 | 12.0 | 0.4 |
| Clifton | 29.3 | 30.1 | 0.8 | 17.3 | 17.8 | 0.5 |
| Brighouse | 33.7 | 32.7 | -1.0* | 15.6 | 16.1 | 0.6 |
| Particulate matter (PM_{10}) (objective = $40 \mu\text{g}/\text{m}^3$) | | | | | | |
| West Vale | 19.4 | 20.0 | 0.6 | 12.9 | 13.3 | 0.4 |
| Clifton | 33.2 | 33.3 | 0.1 | 17.2 | 17.5 | 0.3 |
| Brighouse | 19.2 | 19.9 | 0.7 | 15.2 | 15.5 | 0.3 |
| Particulate matter ($\text{PM}_{2.5}$) (objective = $25 \mu\text{g}/\text{m}^3$) | | | | | | |
| West Vale | 10.4 | 10.6 | 0.2 | 7.5 | 7.6 | 0.1 |
| Clifton | 14.9 | 14.9 | <0.1 | 9.5 | 9.6 | 0.1 |
| Brighouse | 10.7 | 10.9 | 0.2 | 9.1 | 9.2 | 0.1 |

* The reduction in concentration is a result of the reduction in HGVs predicted with the Local Plan in place.

Nitrogen dioxide (NO_2)

- 3.2.5. **Table 3-2** shows the maximum predicted annual mean NO_2 concentrations at 4m from the roadside in West Vale, Clifton and Brighouse are under $33.0 \mu\text{g}/\text{m}^3$ which is 83% of the $40 \mu\text{g}/\text{m}^3$ objective. In Brighouse, the Local Plan will lead to a negligible improvement in the maximum prediction (along Wakefield Road near the A644/A641 junction) because of the expected reduction in HDVs. All impacts on the maximum annual mean concentration are predicted to be $\leq 1.0 \mu\text{g}/\text{m}^3$.
- 3.2.6. **Table 3-2** shows that the average NO_2 concentrations along roads in West Vale, Brighouse and Clifton are under half of the objective in 2032 with the Local Plan in place with the annual mean concentration predicted to be $\leq 1.0 \mu\text{g}/\text{m}^3$.
- 3.2.7. Whilst higher maximum concentrations are predicted for West Vale and Clifton based on the refined model in comparison to CC132, in all three locations the maximum is greater than 10% below the respective annual mean objectives for all 2032 scenarios. The risk of exceedance of the annual mean objective for NO_2 , in 2032 with the Local Plan in place therefore remains low with full Local Plan build out.



Particulate Matter (PM₁₀)

- 3.2.8. **Table 3-2** shows the maximum predicted annual mean PM₁₀ concentration is under the 40 µg/m³ objective in West Vale, Clifton and Brighouse. The highest maximum is predicted to be 33.3 µg/m³ in Clifton, which is under 83% of the objective. The highest average PM₁₀ concentration along road links in West Vale, Brighouse and Clifton are under half of the objective.

Particulate Matter (PM_{2.5})

- 3.2.9. **Table 3-2** shows the maximum predicted annual mean concentration of PM_{2.5} is under the 25 µg/m³ objective in West Vale, Clifton and Brighouse. The highest maximum is predicted to be 14.9 µg/m³ in Clifton less than 60% of the objective. The highest average PM_{2.5} concentrations in West Vale, Brighouse and Clifton are under 40% of the objective along road links.

SUMMARY

- 3.2.10. As no exceedances are predicted for all three pollutants and increases in the maximum and mean concentration are less than 1 µg/m³ the impact of the Local Plan is judged as negligible adverse and the effect not significant in West Vale, Brighouse and Clifton. This is consistent with the results presented in CC132 and indicates that in these areas the judgement on no significant effect remains valid. We however reiterate the requirement for detailed air quality impact assessments specific to each application to be completed in accordance with the WYLES Air Quality & Emissions Technical Planning Guidance and the EPUK/IAQM guidance.

4. RESPONSE TO PEER REVIEW COMMISSIONED BY THE CLIFTON VILLAGE NEIGHBOURHOOD FORUM

4.1. Report Version and Document Control

- 4.1.1. The report version (CC132 and CC132a) uploaded to the examination library is dated 9th April 2021. After the Stage 3 hearings, the Council will hold the additional 14-day consultation on that version of the report.

4.2. Calderdale Strategic Transport Model

- 4.2.1. The CSTM consists of approximately 4,804 road links across the borough with the majority concentrated in the east and in the urban areas of Halifax and Brighouse. For such a large transport model, it is not necessary to model air pollution from all of these road links, many of which carry very low volumes of traffic and/or are located in areas where sensitive properties are located in excess of 200m from the road. Strategic level 'screening', or removal of less significant road links has therefore been completed which is common practice.
- 4.2.2. The AADT flows for the base year are valid as they have been calculated using local permanent Automatic Traffic Count (ATC) data. A relationship was derived between the hourly and daily traffic data collected at monitoring sites across Calderdale for all months in 2014. The derived factors were then applied to the modelled inter-peak, AM and PM periods to estimate AADT flows for individual road links. The 2014 data used is the same as that used to build and validate the base year Saturn model.
- 4.2.3. Local permanent counts for 2014 were used to validate modelled AM, PM and inter-peak period predictions. These modelled period predictions were used to assign hourly profiles to the AADT for each road link for each modelled scenario.
- 4.2.4. Validation of the CSTM is described in the Local Validation Report⁴ referenced in paragraph 3.7.13 of CC132 and WSP's technical note in response to comments from the Clifton Neighbourhood Forum on the CSTM⁵. This matter was addressed at the Stage 2 hearings and is not discussed further.

4.3. Assessment Guidance

- 4.3.1. The assessor was required to balance the need to produce a practical study area with coverage of locations/receptors across the borough as required by the Inspector.
- 4.3.2. We note neither the DMRB LA105 guidance nor the EPUK/IAQM guidance are statutory documents for Local Plan assessments. As noted at paragraph 6.10 of the EPUK/IAQM guidance concerning the traffic screening criteria:

"The criteria provided are precautionary and should be treated as indicative. They are intended to function as a sensitive 'trigger' for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. This possibility will,

⁴ WSP Parsons Brinkerhoff (2016). Calderdale Strategic Transport Model Local Validation Report (October 2016).

⁵ WSP (2021). Technical Note. Response to Clifton Neighbourhood Forum-May 2021. 2nd June 2021.

self-evidently, not be realised in many cases. The criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional judgement, bearing in mind that the objective is to identify situations where there is a possibility of a significant effect on local air quality.”

- 4.3.3. The EPUK/IAQM guidance accepts the requirement for professional judgement in the screening criteria to apply mindful of the objective which is to identify the possibility of significant effects.
- 4.3.4. It should be noted that the adopted Kirklees Local Plan⁶ air quality assessment work also applied the DMRB LA105 (formerly HA207/07) criteria combined with professional judgement.

4.4. Focus Areas

- 4.4.1. A range of locations/receptors in the borough were selected on the following basis:
- All declared AQMAs including No.8 at New Bank
 - Roads within 200m of monitored locations within 10% of the NO₂ annual mean objective based on data from a Defra approved monitoring programme in 2019⁷
 - Roads within 200m of junctions operating at ≥85% capacity in 2014.
- 4.4.2. As a result, modelling was completed with specific focus on the 8 declared AQMAs and a further 18 locations across Calderdale. The purpose of the modelling was to assess the borough wide, cumulative effects of the Kirklees, Bradford and Calderdale Local Plans at the strategic level in these areas assuming full build out of all three local plans.
- 4.4.3. Borough wide, strategic level air quality models are by definition large models intended to represent traffic flows based on regional demands produced by specific allocation areas. As such they are not intended to reproduce fine local detail which is possible from other types of transport models specifically designed for that purpose. To balance the need to produce a practical study area with coverage of locations/receptors across the borough as required by the Inspector, a decision was made to screen according to the government’s LA105 criteria which is appropriate for strategic models.
- 4.4.4. To ensure that the risk of significant effects has been captured across the borough, eight locally derived verification factors were calculated to match model predictions to monitored data. These factors were applied across the borough as described in **Section 4.5.**

4.5. Model Verification

- 4.5.1. Verification in accordance with box 7.14 and box 7.15 as per Defra LAQM.TG(16) is used to determine local ‘adjustment’ factors to ensure the air quality model is able to reproduce the monitoring data. These uplift factors are then applied across the model domain to remove potential underestimates caused by any inaccuracies in the input datasets.

⁶ Aecom (2017). Kirklees Council Air Quality Assessment. Appendix A.

⁷ Calderdale Council. 2020 Annual Status Report. June 2020.

- 4.5.2. An updated table of model verification statistics is provided in **Table B.3 of Appendix B**, which shows that the adjustment factors are all less than 4.3. Table B.3 of Appendix B in document CC132 shows that model verification statistics yield RMSEs of less than $4\mu\text{g}/\text{m}^3$ in all verification zones. This is in line with paragraph 7.541 of the LAQM.TG(16) guidance.
- 4.5.3. **Table B.3 of Appendix B** shows that model adjustment factors were derived for eight distinct zones across Calderdale, which means that specific adjustments have been made to reflect local conditions closely aligned with the traffic model verification areas. As the adjustment factor is applied to the whole verification area, predictions for all locations within the unique zone are uplifted. This includes those where there is no monitoring data.
- 4.5.4. Some monitoring sites were excluded from the verification if they did not meet the siting criteria laid down in paragraph 7.180 of LAQM.TG(16) because they cannot be relied upon to provide reliable results. However, as shown in **Table B.3 of Appendix B** eight unique, locally derived verification factors reflecting local conditions have been applied in the air quality model.
- 4.5.5. While street canyons, local sources and queuing can be represented in air quality models, it is not the purpose to represent the micro-scale environment in a borough wide, strategic air quality model. The model therefore relies on the model adjustment factors to make up for this lack of fine detail which provides an appropriate balance between local conditions and the necessary borough wide coverage. We note the contrast with the approved Kirklees Local Plan modelling in which a single verification factor was applied to the whole borough.

4.6. Planning Applications

- 4.6.1. It is reiterated that the Council does not intend for this strategic level air quality assessment to act as a substitute for future fine detailed air quality assessments in the AQMAs and other areas of concern. Detailed air quality modelling will be requested to accompany each planning application as a second layer of assessment with fine detailed inputs such as street canyons, local sources and road gradients included where necessary. These will be completed in accordance with the WYLES Air Quality & Emissions Technical Planning Guidance and the EPUK/IAQM guidance because fine local detail will be required to assess the local conditions specific to each application.
- 4.6.2. The peer review of the Land East of Brighouse Road in Hipperholme, described in **Section 5**, is an example of a detailed assessment and rigorous review that will be afforded by the Council planning department in consideration of an application. If necessary, this will require the imposition of conditions on the application or refusal where it cannot be demonstrated that national and local planning policies will be met.

4.7. Sensitive Receptors

- 4.7.1. Paragraphs 3.6.4 and 3.5.6 of CC132 reports that roadside compliance receptors at 4m from the roadside are assessed in this strategic level Local Plan air quality assessment. Individual receptor property locations were not assessed to provide a practical model providing local and borough wide detail. Five roadside receptors were modelled for each side of each modelled link in all areas. The results therefore should

not be used to infer the specific number of physical residential properties potentially impacted and are intended to indicate the impact of the Local Plan adjacent to key roads links in each identified sensitive area. The specific impact at local receptors would be addressed in future detailed air quality assessments which will be required to accompany specific planning applications under the WYLES Air Quality & Emissions Technical Planning Guidance.

4.8. Assessment Criteria

SIGNIFICANCE

- 4.8.1. Significance is a matter of professional judgement taking into account the magnitude of impact and other factors related to air quality. Paragraph 7.4 of the EPUK/IAQM guidance states:

“The assessment framework for describing impacts can be used as a starting point to make a judgement on significance of effect, but there will be other influences that might need to be accounted for. The impact descriptors set out in Table 6.3 are not, of themselves, a clear and unambiguous guide to reaching a conclusion on significance. These impact descriptors are intended for application at a series of individual receptors. Whilst it may be that there are ‘slight’, ‘moderate’ or ‘substantial’ impacts at one or more receptors, the overall effect may not necessarily be judged as being significant in some circumstances.”

- 4.8.2. It is therefore not the case that the presence of some moderate and substantial adverse impacts must yield a judgement of an overall significant effect from the Local Plan. The judgement of the significance of the Local Plan takes into account the predicted concentrations across a range of receptors, the magnitude of impacts, generated exceedances and uncertainty in the assessment process.

LEGISLATION

- 4.8.3. The Council is aware of the presence of the Environment Bill⁸ which may in the future lead to the adoption of new air quality standards aligned with World Health Organisation guidelines. However, the impact of the Local Plan has been assessed with reference to air quality objectives set out in the Air Quality Standards Regulations (England) under existing law. Relevant legislation, policy and guidance is described in Section 2 of CC132.
- 4.8.4. Any changes to the national air quality objectives would be accounted for in the assessments for specific planning applications during the life of the Local Plan. Appropriate mitigation required to meet these objectives would be applied in accordance with the WYLES Air Quality & Emissions Technical Planning Guidance which states in Section 3.1:

“Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas.”

⁸ Environment Bill 2020 2019-21 (as amended in Committee) 27 November 2020.
<https://publications.parliament.uk/pa/bills/cbill/58-01/0009/20009.pdf>. Accessed June 2021.



- 4.8.5. It would be a requirement of the WYLES Air Quality & Emissions Technical Planning Guidance for planning applications to demonstrate compliance with national objectives through an air quality impact assessment if they are changed in future.

5. PEER REVIEW OF CROSSLEE APPLICATION, HIPPERHOLME

5.1. Introduction

- 5.1.1. Land East of Brighthouse Road in Hipperholme, Halifax is the site of a proposed mixed-use allocation (LP0032) represented in the draft Local Plan which is currently subject to public examination. An outline planning application for the whole mixed-use allocation (LP0032) has been submitted with an accompanying air quality assessment⁹. This section provides a peer review of the air quality assessment and associated recommendations.
- 5.1.2. The application site is located approximately 330m south-east of Calderdale AQMA No.7, which was declared by the Council due to exceedances of the annual mean air quality objective for NO₂. Elevated pollutant concentrations continue to be monitored in the AQMA largely as a result of road traffic emissions (A644 Brighthouse Road and the local road network). The application has the potential to temporarily and permanently change local air quality as a result of fugitive dust emissions during construction and changes to the amount of road vehicle exhaust emissions during operation.
- 5.1.3. The accompanying air quality assessment examines emissions from construction activities and changes to local traffic flows on existing and proposed human exposure. This information is used to determine the significance of the application on local air quality.

5.2. Peer Review

- 5.2.1. This section provides a peer review of the air quality assessment in the context of national and local planning guidance and a judgement as to veracity of the impacts. Key peer review points are summarised in **Table 5-1** and is followed by an overarching summary.

⁹ Delta Symonds (2021). Air Quality Assessment. Land East of Brighthouse Road, Hipperholme, Halifax. Presented by Crosslee PLC. May 2021.

Table 5-1 – Peer review of Crosslee Application, Hipperholme

| Section | Peer Review Comment | Recommendation |
|--------------------------------|---|--|
| Introduction | <p>The proposals are for a mixed-use development in the village of Hipperholme, Halifax. The Application Site is located around 330m south east of the Calderdale AQMA No.7, which was declared to due exceedances of the annual mean NO₂ objective. The Application Site is mainly influenced by emissions from road traffic using the A644.</p> | <p>Further scheme details are required to justify the classification of the development at Stage 1 of the WYLES Air Quality & Emissions Technical Planning Guidance assessment process.</p> |
| Legislation, Policy & Guidance | <p>The air quality assessment references the most appropriate and up to date legislation and policy, including the emerging Calderdale Local Plan.</p> <p>The National Planning Practice Guidance, WYLES Air Quality & Emissions Technical Planning Guidance, the Councils Air Quality Action Plan and best practice guidance documents are all correctly referenced.</p> | <p>While the WYLES Air Quality & Emissions Technical Planning Guidance is referenced, the assessment report does not follow the 3-stage approach for assessing air quality impacts as is required to support the overarching aims of the WYLES which is to reduce road transport emissions in West Yorkshire.</p> |
| Scope & Methodology | <p>The scope of the assessment was not agreed beforehand with the local council before submission.</p> <p>A qualitative construction phase assessment has been undertaken with reference to the IAQM guidance.</p> <p>A detailed air quality modelling assessment has been undertaken to assess both the suitability of the Application Site for its proposed use and the impact of road traffic generated by the Proposed Development on local air quality at existing sensitive receptor locations. The assessment focused on traffic related pollutants; NO₂, PM₁₀ and PM_{2.5}. This was undertaken using ADMS-Roads and included the following model parameters:</p> <p>2019 meteorological data from Bradford Bingley.</p> <ul style="list-style-type: none"> Traffic emissions calculated from Defra’s Emissions Factor Toolkit (EFT v10.1). A model roughness length of 0.5m for the dispersion site and 0.2 for the meteorological site. | <p>The methodology, for both the construction and operational phases, are considered to be appropriate for the Proposed Development. However, Appendix E does not provide any information as to how scheme generated traffic was estimated which would have supported the development classification according to the WYLES Air Quality & Emissions Technical Planning Guidance.</p> |

| Section | Peer Review Comment | Recommendation |
|---------------------|--|---|
| | <ul style="list-style-type: none"> The above model parameters are all considered to be appropriate for the Proposed Development. <p>The operational phase assessment was undertaken with reference to Defra¹⁰ and EPUK/IAQM guidance¹¹.</p> <p>Traffic data was provided by the projects transport consultant for the following scenarios:</p> <ul style="list-style-type: none"> 2019 Baseline and model verification. 2024 Opening year without development. 2024 Opening year with development. <p>For the purposes of the assessment, background concentrations and emissions in the opening year scenarios (2024) were held at the baseline year (2019). This ensures a conservative assessment as backgrounds and emission rates are assumed not to improve over time.</p> | |
| Model Verification | <p>Model verification has been carried out at four diffusion tubes within the village of Hipperholme, all of which are located within the AQMA. The selection of these four sites are considered suitable for verification purposes.</p> <p>Verification was carried out with reference to the Defra LAQM.TG(16) guidance which is best practice.</p> <p>Following the verification process, an adjustment factor of 1.39 has been derived. After applying the adjustment factor, all results are within 25% of monitored concentrations. However, this is not explicitly stated or shown in the report. A statistical analysis of the verification results has been undertaken, however, the post adjustment RMSE has not been explicitly stated.</p> | <p>The key model performance statistic RMSE has not been provided. Therefore, the level of confidence in the model cannot be determined. This means that an evaluation of the judgement of significance, which should consider model predictions, model performance and assumptions cannot be made.</p> |
| Sensitive Receptors | <p>Worst case receptors have been selected which represent high sensitivity receptors (houses and schools) adjacent to the model road network. A number of proposed receptors have also been</p> | None |

¹⁰ Department for Environment, Food and Rural Affairs (Defra) 2018 Part IV The Environment Act 1995 and Environment Order 2002 Part III, Local Air Quality Management Technical Guidance LAQM.TG.16

¹¹ Environmental Protection UK and Institute of Air Quality Management (Version 1.2) Land Use Planning & Development Control: Planning for Air Quality

| Section | Peer Review Comment | Recommendation |
|-------------------------|---|--|
| | <p>selected to represent locations of future residential dwellings. All receptors have been modelled at a height of 1.5m. The selection of sensitive human receptors is considered suitable.</p> <p>No ecological receptors have been included in the assessment. A desk-based review carried out by WSP has identified that there is one designated site, Common Wood Ancient Woodland located within 200m of the modelled road network. However, traffic generation at this designated site would fall well below the screening criteria outlined in the IAQM guidance¹². As such, an assessment of the impacts on designated sites is not considered necessary.</p> | |
| Baseline Assessment | <p>No industrial pollution sources have been identified in proximity to the Application Site. The Proposed Development is mainly influenced by traffic using the local road network, primarily the A644.</p> <p>A review of the local air quality monitoring data has identified one exceedance of the annual mean NO₂ objective from diffusion tubes in Hipperholme in the most recent year 2019 as presented in the Annual Status Report.</p> | It would have been beneficial to note the general trend in air quality in the AQMA No.7 which shows the NO ₂ concentrations fell from a peak of 58µg/m ³ in 2016 to 41µg/m ³ in 2019. |
| Construction Assessment | <p>The construction phase assessment has identified that there is a high to medium risk of dust soiling and a medium to low risk for human health impacts during the construction phase of the Proposed Development. This is considered to be appropriate based on the information provided in the report and measures to mitigate emissions during construction are recommended and these are considered to be proportional to the risk.</p> <p>Potential impacts on construction vehicles have been assessed qualitatively. The assessment has concluded negligible impacts based on the relatively low number of vehicles in comparison to existing flows on the local road network.</p> | The assessment report falls short of describing how the proposed mitigation measures will be secured in the interest of protecting short term public health and amenity. |
| Operational Assessment | A comparison of pollutant emissions between the 'without' and 'with' development scenarios has been carried out. The results show that for existing sensitive receptors, there is one predicted exceedance of the annual mean NO ₂ objective with the development in operation. Exceedances also occur in the baseline and without development scenario at this receptor. | The Proposed Development is assessed as being suitable for its proposed land use. However, without fully understanding the performance of the model a robust judgement cannot be made. Further information should |

¹² Institute of Air Quality Management. A guide to the assessment of air quality impacts on designated nature conservation sites. Version 1.1 May 2020

| Section | Peer Review Comment | Recommendation |
|-------------|--|--|
| | <p>No exceedances of the annual mean objectives for PM₁₀ or PM_{2.5} are predicted at any existing receptors in any modelled scenarios. Furthermore, no exceedances of the short-term objectives for NO₂ or PM₁₀ are predicted in any scenario.</p> <p>A reduction in pollutant concentrations is predicted at all modelled receptors as a result of the operation of the Proposed development. This is due to an overall reduction in traffic flows on the local road network as a result of the Proposed Development.</p> <p>No exceedances of the annual mean objectives for NO₂, PM₁₀ or PM_{2.5} are predicted at any proposed receptors. With reference to the EPUK/IAQM significance criteria, the impacts of the Proposed Development are considered to be not significant.</p> | <p>be provided on traffic data derivation and model performance.</p> |
| Mitigation | <p>The proposed construction mitigation measures are in line with the IAQM guidance for a development of this size and are considered to be appropriate.</p> <p>Based on the predicted negligible impact, no operational mitigation measures have been advised. Although no mitigation is required, reference could be made to the 'good practice methods' within the EPUK/IAQM guidance or the mitigation measures outlined in the West Yorkshire Technical Planning Guidance.</p> | <p>The assessment report falls short of describing how the proposed mitigation measures will be secured in the interest of protecting short term public health and amenity.</p> <p>Once further information is provided to justify the impact assessment results, the adequacy of proposed mitigation can be determined. For example, depending on traffic flows it is possible that as a Major development a damage cost calculation would be required such is the proximity to the Hipperholme AQMA.</p> |
| Conclusions | <p>The report concludes that the development complies with national and local planning policy and that, in terms of air quality, there is no reason to withhold planning consent. This conclusion is considered to be appropriate based on the information provided in the report.</p> | <p>The development is assessed as being suitable for its proposed land use. However, this judgement is not properly justified in the context of model performance.</p> |

5.3. Summary

- 5.3.1. The scope and methodology detailed within the air quality assessment are considered to be broadly appropriate for a development of this nature. However, the assessment does not follow the three-step process shown in Figure 1 of the WYLES Air Quality & Emissions Technical Planning Guidance¹³ and as such it is not clear how the development should be classified. This has implications for the detail required in the assessment and the level of mitigation required in what is a highly sensitive area for air quality proximate to the Hipperholme AQMA. It is not currently possible to determine whether the development will support the overarching aims of the WYLES, which is to reduce road transport emissions in West Yorkshire, from the information provided in the report.
- 5.3.2. Traffic data is a key input to the air quality modelling process. Although the source of local ATCs for baseline traffic flow conditions are described, the means whereby trip generation has been assessed is not provided in the report. Furthermore, clarification is required as to why the development results in a net decrease in traffic flows and subsequently a reduction in pollutant concentrations at sensitive receptors. It is likely that the development is predicted to have a lower trip generation in comparison to the previous land use at the Application Site, however, this needs to be confirmed before a judgement of impacts is possible.
- 5.3.3. The key model performance statistic, the RMSE, is not provided in the assessment report. Therefore, the level of confidence in the predictive model cannot be determined. This means that an evaluation of the judgement of significance, which should consider both model predictions, model performance and assumptions cannot be made. Based on the information in the report, it is likely that the RMSE is above $4\mu\text{g}/\text{m}^3$ as recommended in paragraph 7.541 of the Defra Local Air Quality Management Technical Guidance LAQM.TG(16). As such, three modelled receptors R9, R18 and R21 could be at risk of exceeding the annual mean objective of $40\mu\text{g}/\text{m}^3$.

5.4. Recommendations

- 5.4.1. It is requested that the following information should be provided before a judgement of the impact on local air quality can be made:
- Further development design information to justify the classification of the development at Stage 1 of the WYLES Air Quality & Emissions Technical Planning Guidance.
 - How the traffic data were derived because it is not sufficient to state that it was provided by the Transport Consultant. It is illogical that a new mixed-use development consisting of residential, a supermarket and new industrial use will cause a reduction in traffic compared to a closed factory.
 - What is included in the 2024 baseline data?
 - As Crosslee has been closed since 2019, has the consented traffic been removed from the Do-Minimum?

¹³ Air Quality & Emissions Technical Planning Guidance. Part of the West Yorkshire Low Emissions Strategy

- We note the RMSE is likely to be over $6.0\mu\text{g}/\text{m}^3$ which is outside the recommended $4\mu\text{g}/\text{m}^3$ described in the Defra guidance. When added to the Do-Something maxima it is possible there could be exceedances of $40\mu\text{g}/\text{m}^3$ at modelled receptors R9 (2 Brighthouse Road), R18 (2 Lees Building), R21 (Ashwell House) and R23 (20 Thompson Court). If the consultant is confident in these predictions, justification as to why mitigation is not required should be provided when the modelling shows that one receptor will exceed, and three others are at risk.
- Were variable speeds used in the modelling to account for congestion on junction approaches? If so, what speeds were used, what was the length of the junction approaches and how were these estimated?
- Were street canyons represented in the model? We note that, although the roads don't represent a traditional street canyon, monitor HH-LT is on a building façade and as such there could be a partial canyon effect. There are a number of roadside exposures in the AQMA.
- A review of mitigation requirements in accordance with the WYLES Air Quality & Emissions Technical Planning Guidance, the context of the results and the means by which these measures will be secured.

5.4.2. We recommend that approval for the development is not granted until the requested information is provided.

Appendix A

ROAD-NOX ADJUSTMENT FACTORS



APPENDIX A – ROAD-NO_x ADJUSTMENT FACTORS

The study area was divided into eight distinct ‘verification zones’ which were chosen based upon the availability of monitoring data, similarity of land use (road type and density, the level of urban development) and the presence of AQMAs. The eight verification zones broadly correspond with the 2011 census output areas used in the verification of the Calderdale Strategic Transport Model Local Validation Report¹⁴. These areas are shown in **Figure B.1**.

Figure B.1 – Saturn Model 2011 Census Output Areas Used to Align Model Verification Zones



Table B.3 below presents a summary of adjustment factors applied to the road-NO_x predictions. For the verification zones shown in **Figure B.1**.

¹⁴ WSP Parsons Brinkerhoff (2016). Calderdale Strategic Transport Model Local Validation Report (October 2016). <https://www.calderdale.gov.uk/v2/residents/environment-planning-and-building/planning-policy/local-plan/evidence-base/transport>. Accessed April 2021.



Table B.3 – Road-NO_x Adjustment Factors in CC132

| Site ID | Monitoring Site Location | Zone | Verification Adjustment Factor | Site ID | Monitoring Site Location | Zone | Verification Adjustment Factor |
|---------|--------------------------|--------|--------------------------------|---------|--------------------------|---------|--------------------------------|
| LV-NBN | New Bank | Zone 1 | 3.0 | LV-62W | Clifton | Zone 5 | 2.3 |
| LV-NBS | New Bank | | | LV-62E | Clifton | | |
| NB-NB1 | New Bank | | | WR2 | Brighouse | | |
| NB-GR | New Bank | | | BH3 | Brighouse | | |
| SC5 | Stump Cross | | | BE4 | Brighouse | | |
| SB3 | Sowerby Bridge | Zone 2 | 1.0 | BE2 | Brighouse | | |
| AQC1 | Salterhebble | Zone 3 | 1.9 | HQ1 | Hebden Bridge | Zone 6a | 4.3 |
| AQC2 | Salterhebble | | | HB6 | Hebden Bridge | | |
| AQC3 | Salterhebble | | | HQ9 | Hebden Bridge | | |
| CRH1 | Salterhebble | | | BS1 HB | Hebden Bridge | | |
| AQ21 | Salterhebble | | | MY-04 | Mytholmroyd | Zone 6b | 1.9 |
| LV-SCA | Scammonden | MY-05 | Mytholmroyd | | | | |
| LV-SAA | Ainley Top | Zone 4 | 1.1 | MY02 | Mytholmroyd | | |
| CL1 | Elland | | | LF2 | Luddendenfoot | Zone 6c | 4.3 |
| AT-BR | Ainley Top | | | | | | |
| AT-MR | Ainley Top | | | | | | |
| AT-MR2 | Ainley Top | | | | | | |

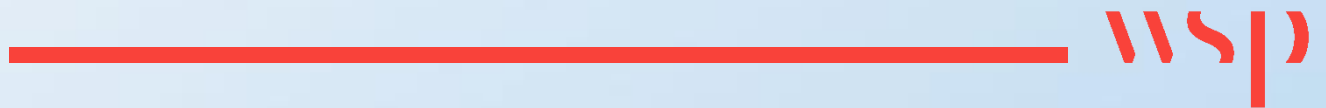
--only one tube was usable for verification in this zone and so a correlation coefficient cannot be derived.



Table B.3 of Appendix B of the CC132 Document shows with road-NO_x adjustment factors applied to the modelled values, the total annual mean NO₂ concentrations derived in each verification zone are within +/-10% (4µg/m³) of the monitored equivalents which is compliant with the guideline in LAQM.TG16 paragraph 7.541. Each verification zone displays a fractional bias close to zero after adjustment which means the model has no tendency toward under or over prediction.

Appendix B

SUPPLEMENTARY LOCAL RESULTS



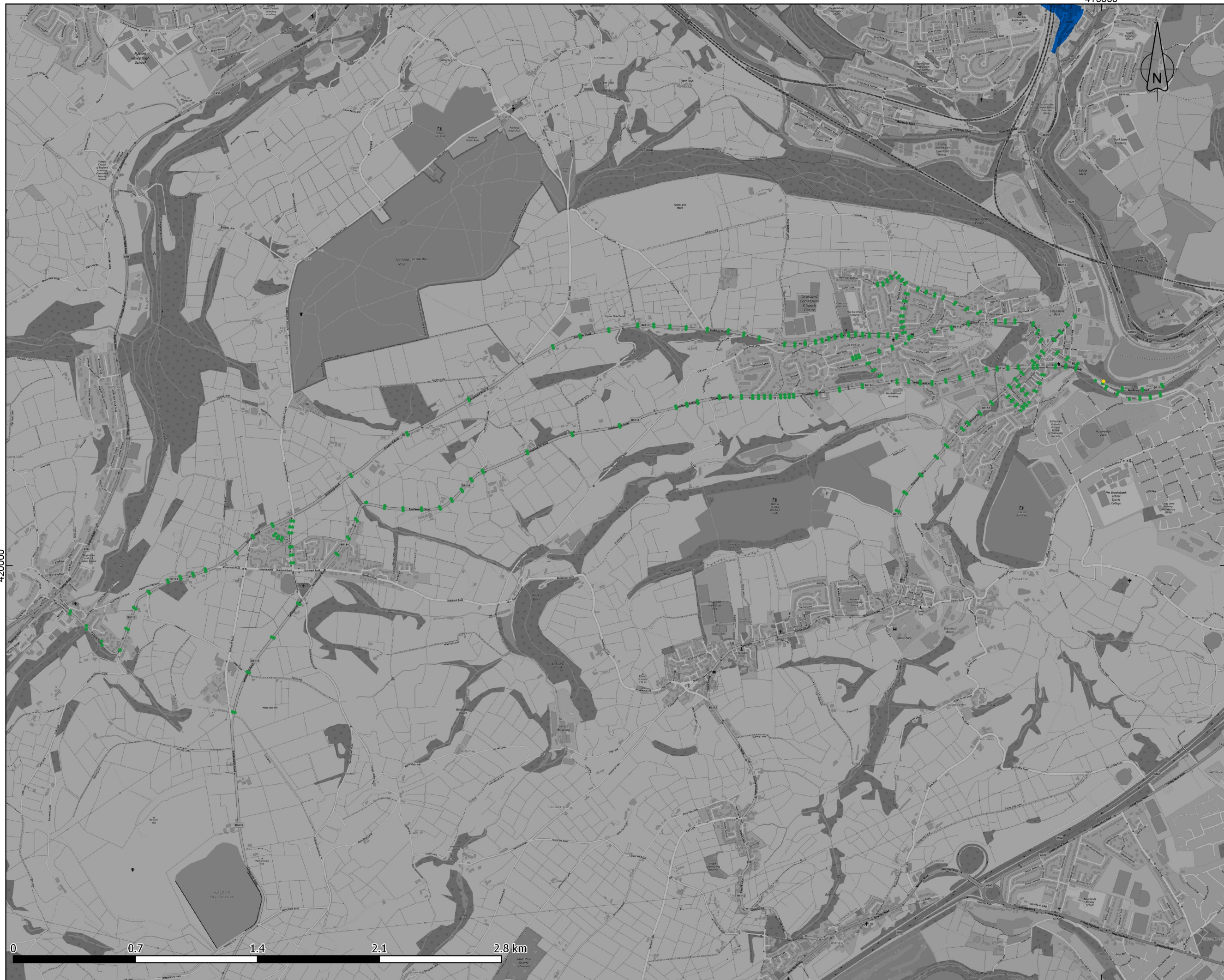


APPENDIX B – SUPPLEMENTARY LOCAL RESULTS

‘DO-SOMETHING’ NO₂ RESULTS WITH LOCAL PLAN (INCLUSIVE OF OTHER LOCAL PLANS)



Plate B-1 – West Vale Do-Something 2032 With Local Plan NO₂



Legend

- AQMA
- NO₂ Concentration (µg/m³)**
- 0 - 36
- 36 - 40
- 40 - 60
- >60

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| | | | |
|------------------|----|------|--------|
| Revision Details | By | Date | Suffix |
| | | | |

Drawing Status: **FINAL**

Job Title:
**Calderdale District Council
 Local Plan**

Drawing Title:
**Air Quality Assessment
 Without Local Plan NO₂
 Concentrations - Westvale**

Scale at A3: **1:20,000**

| | | | |
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| Drawn | UKLFS001 | | |
| Stage 1 check | XX | Stage 2 check | XX |
| Originated | XX | Date | 22/06/2021 |



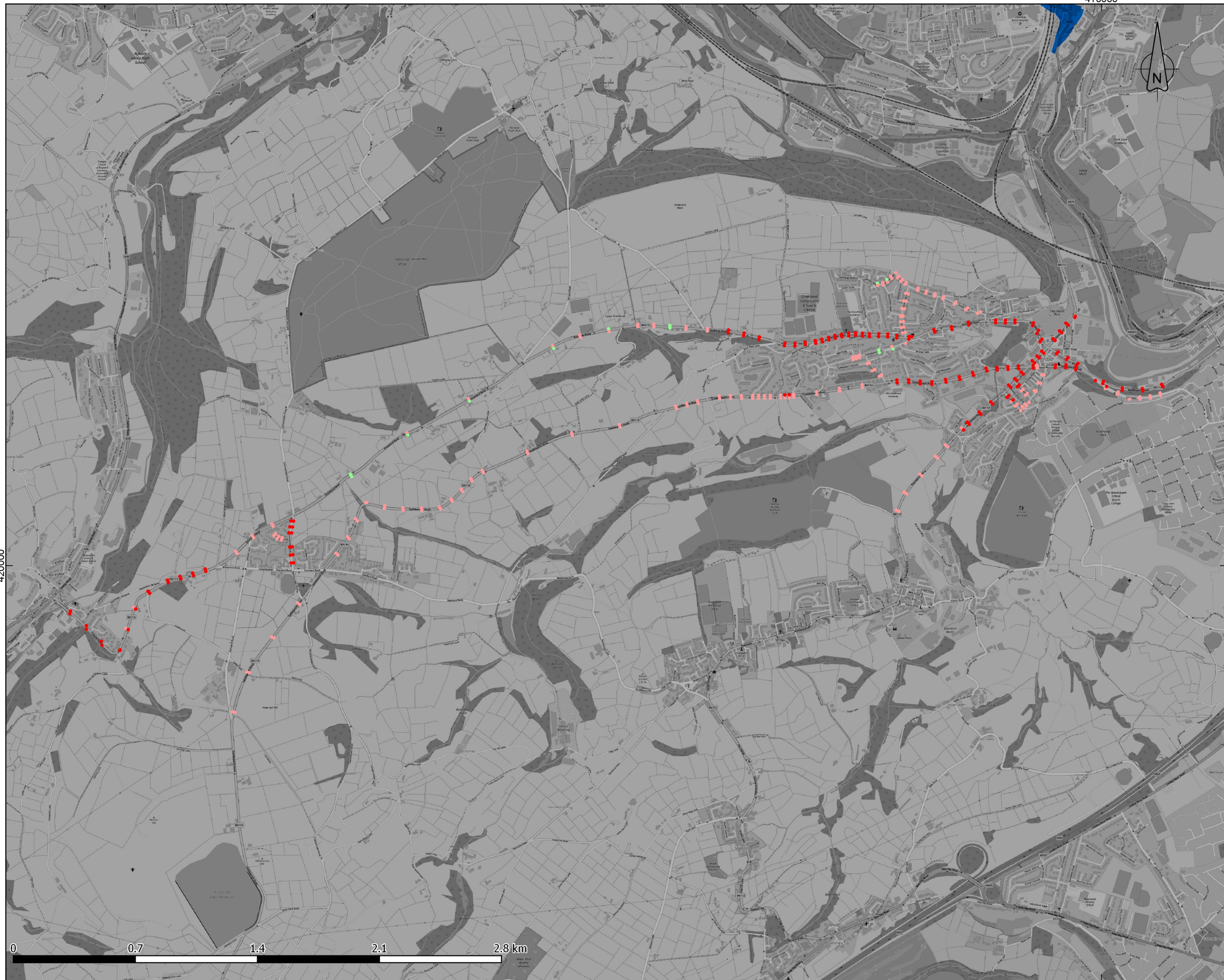
Drawing Number: **Figure 2**



Plate B-2 – West Vale Do-Something 2032 With Local Plan Change in NO₂

Legend

- AQM20210331
- Change in NO₂ Concentration (µg/m³)**
- >4 µg/m³ Improvement
- 2 - 4
- 0.4 - 2
- 0 - 0.4
- No Change
- 0 - 0.4
- 0.4 - 2
- 2 - 4
- >4 µg/m³ Deterioration



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| | Check | | |

Drawing Status: **FINAL**

Job Title:
**Calderdale District Council
 Local Plan**

Drawing Title:
**Air Quality Assessment
 Changes in Concentrations of NO₂ -
 Westvale**

Scale at A3: **1:20,000**

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|---------------|----------|---------------|------------|
| Drawn | UKLFS001 | Originated | Date |
| Stage 1 check | XX | Stage 2 check | XX |
| | | XX | 22/06/2021 |



Drawing Number: **Figure 4**



Plate B-3 – Brighouse and Clifton Do-Something 2032 With Local Plan NO₂



Legend

- AQMA
- NO₂ Concentration (µg/m³)**
- 0 - 36
- 36 - 40
- 40 - 60
- >60

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Drawing Status: **FINAL**

Job Title: **Calderdale District Council Local Plan**

Drawing Title: **Air Quality Assessment Without Local Plan NO₂ Concentrations - Brighouse and Clifton**

Scale at A3: **1:13,000**

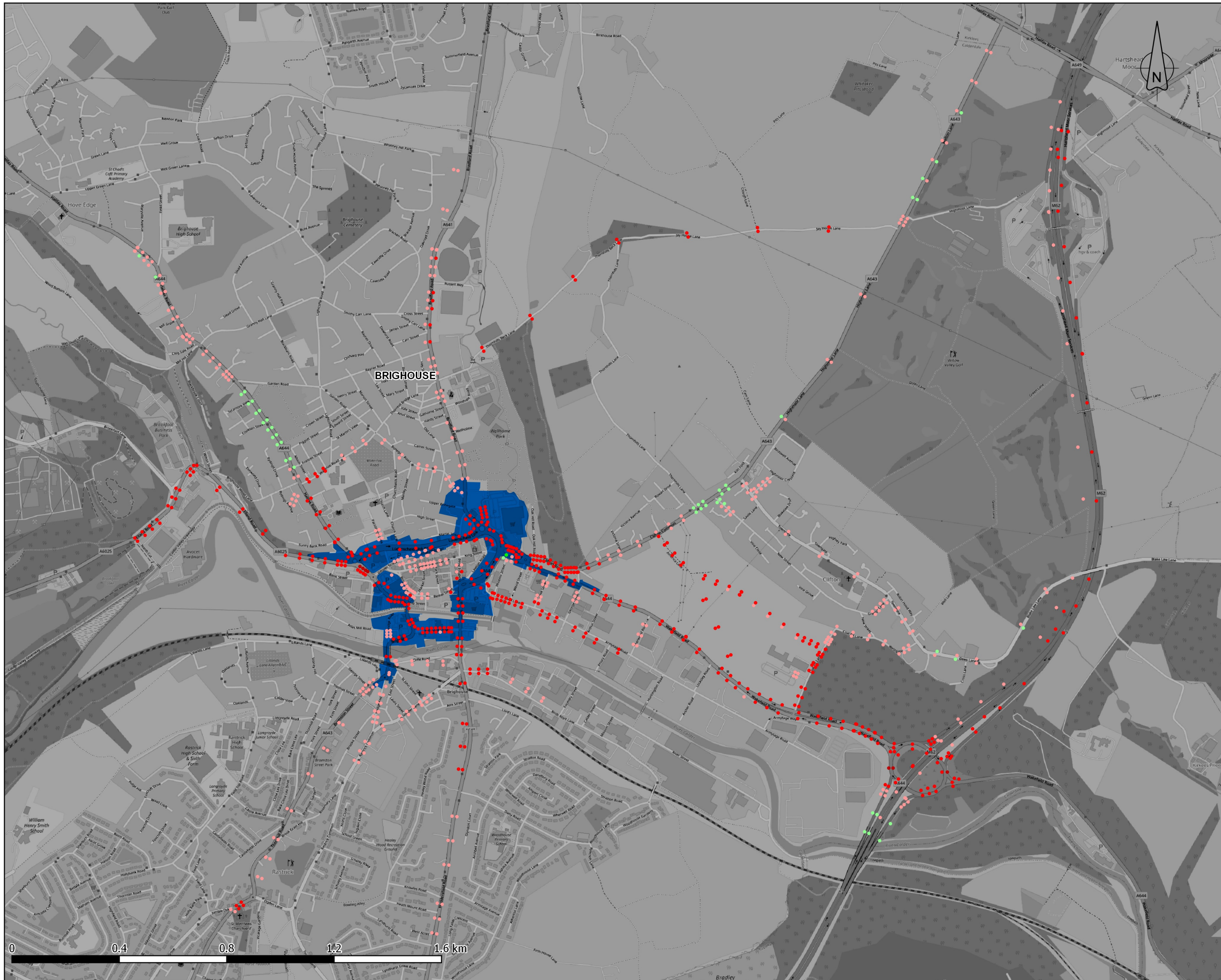
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|---------------|----------|---------------|------------|
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| Stage 1 check | XX | Stage 2 check | XX |
| Originated | XX | Date | 22/06/2021 |



Drawing Number: **Figure 1**



Plate B-4 – Brighouse and Clifton Do-Something 2032 With Local Plan Change in NO₂



Legend

- AQM20210331
- Change in NO₂ Concentration (µg/m³)**
- >4 µg/m³ Improvement
- 2 - 4
- 0.4 - 2
- 0 - 0.4
- No Change
- 0 - 0.4
- 0.4 - 2
- 2 - 4
- >4 µg/m³ Deterioration

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| Revision Details | By | Date | Suffix |
| | | | |

Drawing Status: **FINAL**

Job Title: **Calderdale District Council Local Plan**

Drawing Title: **Air Quality Assessment Changes in Concentrations of NO₂ - Brighouse and Clifton**

Scale at A3: **1:13,000**

| | | | |
|---------------|----------|---------------|------------|
| Drawn | UKLFS001 | Originated | Date |
| Stage 1 check | XX | Stage 2 check | XX |
| | | | 22/06/2021 |



Drawing Number: **Figure 3**

Appendix C

MONITORING DATA



APPENDIX C – MONITORING DATA

Appendix D shows NO₂ diffusion tube monitoring results for the locations Hebden Bridge, Luddendenfoot, Sowerby Bridge and West Vale.

Plate C-1 NO₂ Monitoring Results for the Hebden Bridge AQMA

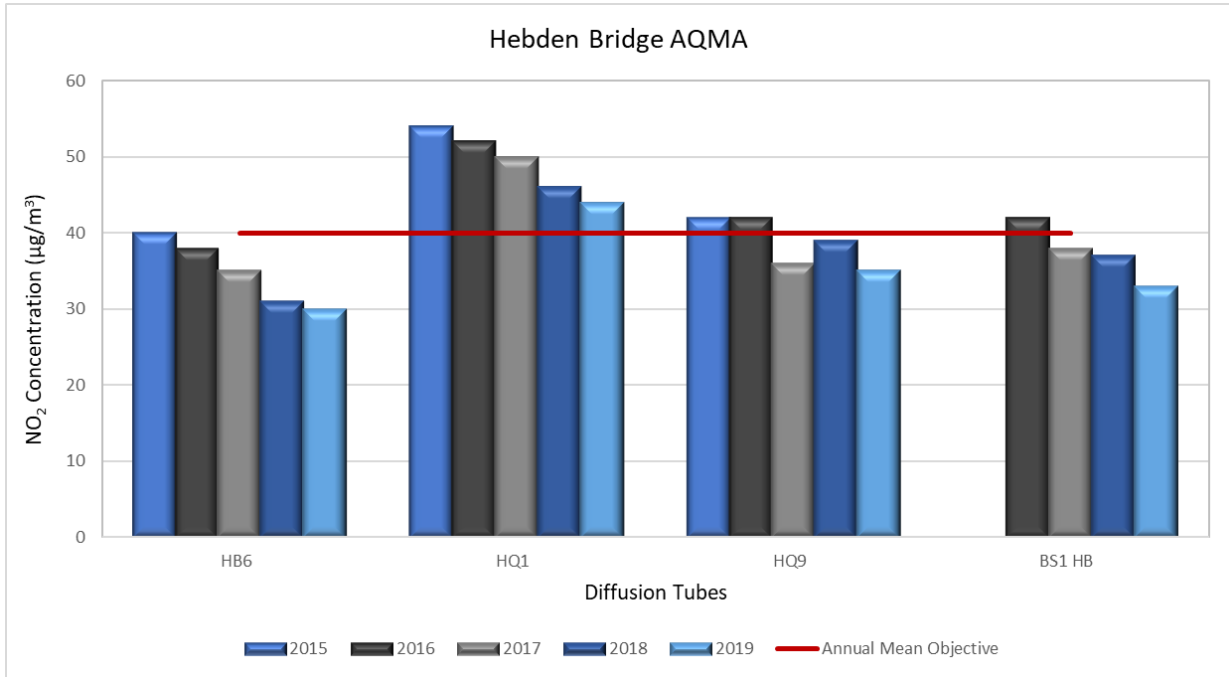


Plate C-2 NO₂ Monitoring Results for the Luddendenfoot AQMA

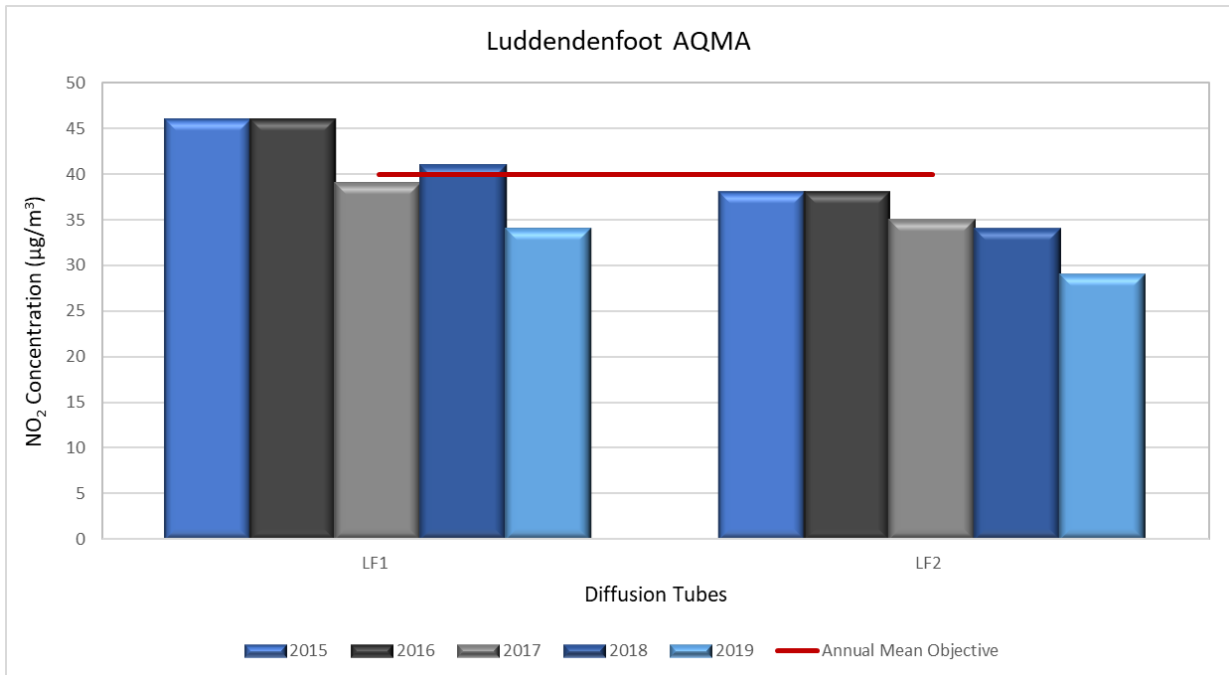


Plate C-3 NO₂ Monitoring Results for the Sowerby Bridge AQMA

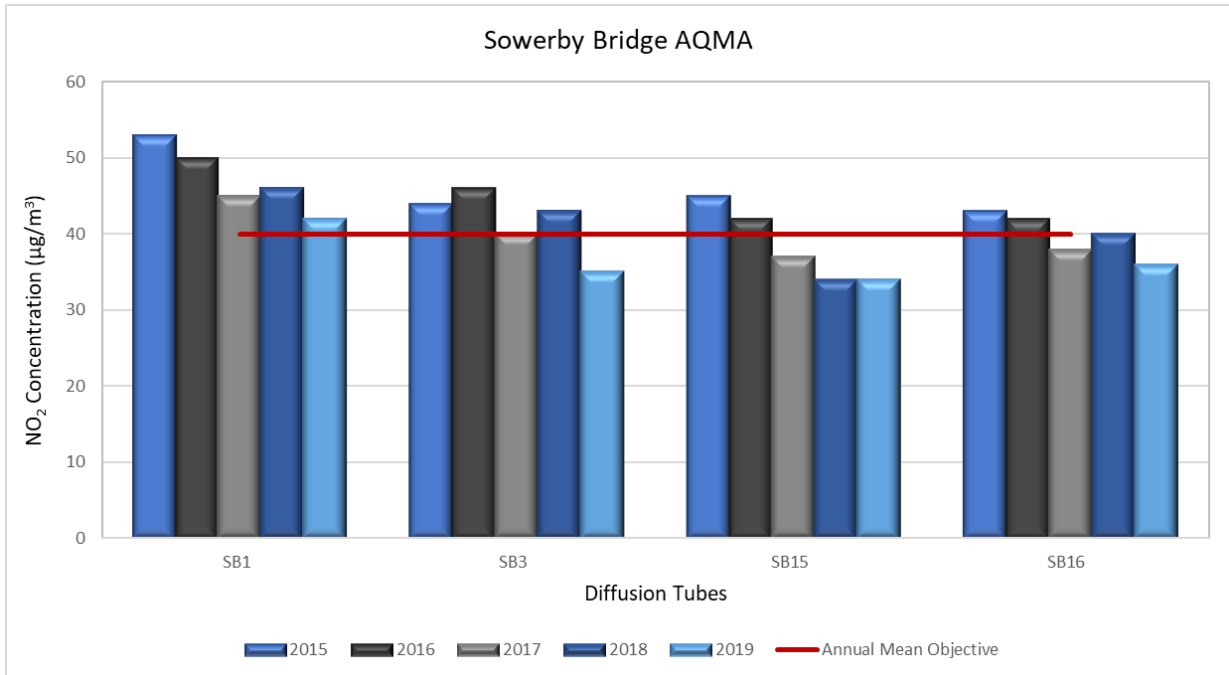
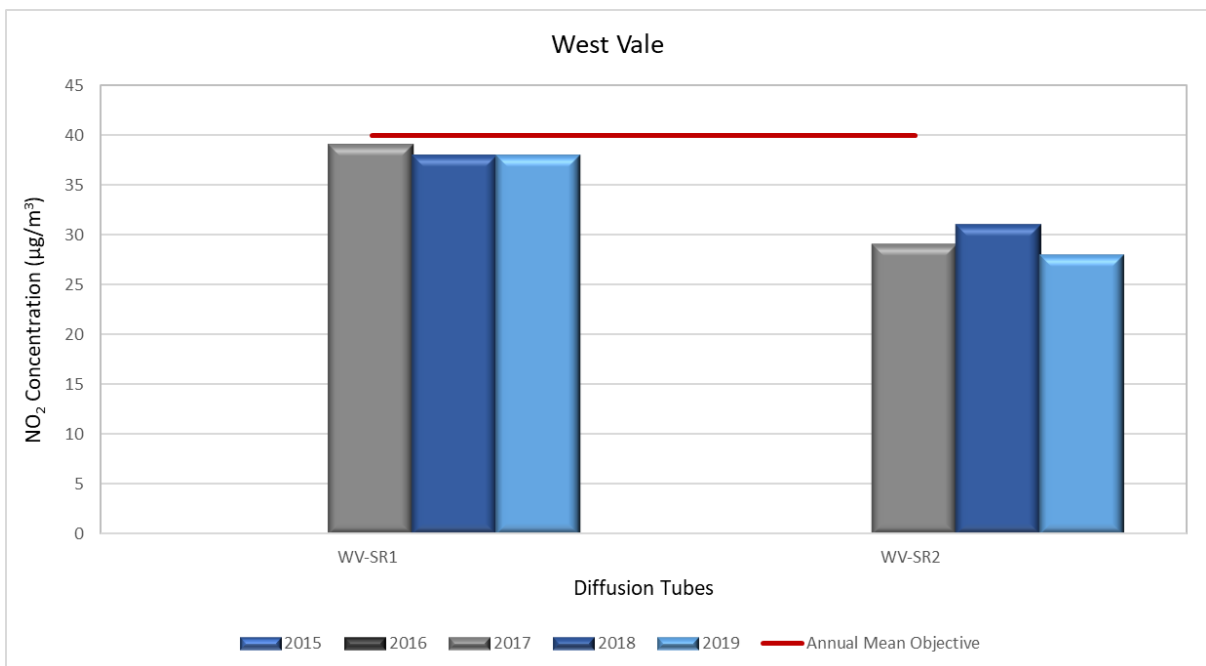


Plate C-4 NO₂ Monitoring Results for West Vale





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Leeds
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wsp.com