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Zouch Bridge Replacement

Air Quality

Proof of Evidence of Elisha Coutts BSc MSc MIEnvSc MIAQM

Prepared for Leicestershire County Council

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Table of Contents

1. Witness Information

1.1.1. My name is Elisha Coutts. I am an Associate with AECOM Infrastructure & Environment UK Limited. My academic qualifications comprise a BSc (Hons) in Chemistry and Molecular Physics and an MSc in Environmental Science. I am a full Member of the Institute of Environmental Science and Member of Institution of Air Quality Management. I have thirteen years' experience in air quality assessment.

1.1.2. During my employment with AECOM I have completed and managed air quality impact assessments for a broad range of projects covering road, rail, tram, residential and mixed use developments.

1.1.3. In particular, I have provided air quality assessments for a number of road schemes, including schemes for Local Authorities, Highways England, Transport for London and Transport Scotland.

1.1.4. I am responsible for the air quality impact assessment and the resulting air quality impact assessment report for the Scheme prepared in June 2016.

2. Scope of Evidence

2.1.1. The purpose of my evidence is to summarise the findings of the air quality impact assessment for the Scheme and address Scheme objections.

2.1.2. The structure of my evidence is as follows:

- Section 3 provides a description of the Scheme.
- Section 4 presents a summary of the air quality assessment.
- Section 5 deals with issues raised by objectors.
- Section 6 presents the conclusions.

3. Description of the Scheme

3.1.1. The existing Zouch Bridge is situated within Zouch village in Leicestershire, 5 km north of Loughborough at approximate Ordnance Survey Grid Reference (OSGR) SK 50260 23240. The preferred location for the replacement bridge is slightly to the south of the existing one, which traverses the River Soar between Hathern Parish and Normanton on Soar Parish. This removes the need for substantial traffic diversions which would be needed during construction if the replacement bridge was built in the same place.

3.1.2. With respect to potential air quality impacts, there are two main factors which must be considered:

- The relocation of the replacement bridge and the approach roads, including local accesses, to the south of the existing bridge; and
- Currently, the speed limit over the existing bridge is 60 miles per hour (mph), reducing to 40mph approximately 80 meters (m) to the east of the bridge. With the new bridge in place it is proposed to extend the 40mph speed limit to approximately 130m west of the bridge.

3.1.3. These factors have been taken into account in developing the detailed assessment of operational air quality impacts and in the consideration of potential construction phase impacts.

4. Summary of Air Quality Assessment

4.1.1. This section summarises the air quality assessment undertaken for the Zouch Bridge Replacement scheme prepared in June 2016. The summary sets out the following:

- Legislation and Planning Policy relevant to air quality and current at the time of the assessment;
- A review of the newly issued National Planning Policy Framework (NPPF);
- The air quality assessment methodology;
- Baseline air quality conditions around the Scheme area;
- The potential effect of the scheme on air quality;
- Proposed mitigation measures for air quality; and
- The conclusions of the above assessment.

Legislation and Planning Policy

4.1.2. The UK National Air Quality Strategy published in 2007 Strategy (Defra 2007) sets objective values for key pollutants as a tool to help Local Authorities manage local air quality improvements in accordance with the EU Air Quality Framework Directive. Some of these objective values have been laid out within the Air Quality (England) Regulations 2000 (HMSO, 2000) and as amended (HMSO, 2002). A new draft Clean Air Strategy 2018 was published on the 22nd of May 2018. The draft Clean Air Strategy 2018 does not amend the air quality objective values considered for the Scheme.

4.1.3. For the purposes of this assessment, the relevant air quality objectives are those for nitrogen dioxide (NO_2, particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$) as set out in Table 4.1:

Table 4.1: Air Quality Objective Values

Pollutant	Averaging Period	Objective (µg/m^3)	Maximum Permitted Exceedances*	Target Date#
Nitrogen dioxide (NO_2)	Annual Average	40	None	31/12/05
	1-hour Average	200	18	31/12/05
Particulate Matter (PM_{10})	Annual Average	40	None	31/12/04
	24-hour Average	50	35	31/12/04
Fine Particulate Matter ($PM_{2.5}$)	Annual Average	25	None	2020

** The number of times the objective can be exceeded within each year*

[#] *The date by which the objective should be or should have been achieved as set out in the Air Quality (England) Regulations and amendment*

4.1.4. The National Planning Policy Framework (NPPF) which was current during the development of the Scheme was published in March 2012 (DCLG, 2012). Paragraph 109 of the NPPF (2012 version) states that:

> *"The planning system should contribute to and enhance the natural and local environment by:*
>
> *preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability…"*

4.1.5. Annex 2 of the NPPF (2012 version) defines 'Pollution' as:

> *"Anything that affects the quality of land, air, water or soils, which might lead to an adverse impact on human health, the natural environment or general amenity. Pollution can arise from a range of emissions, including smoke, fumes, gases, dust, steam, odour, noise and light".*

4.1.6. There are national, regional and local policies for the control of air pollution and local action plans for the management of local air quality across the scheme. The effect of the Scheme on the achievement of such policies and plans are matters that may be a material consideration by planning authorities, when making decisions for individual planning applications. Paragraph 124 of the NPPF (2012 version) states that:

> *"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. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan."*

4.1.7. In addition to the national policy set out above, Rushcliffe Borough Council (RBC) and Charnwood Borough Council (CBC) have local planning policies relating to air quality.

4.1.8. In place of having a borough specific policy RBC has adopted the Nottinghamshire Air Quality Strategy (Nottinghamshire Environmental Protection Working Group, 2008) which outlines actions which will and should be taken by councils within Nottinghamshire to address air quality issues. RBC will:

> *"Develop, implement and maintain procedures to ensure that neighbouring councils are consulted on any proposed development likely to significantly affect air quality within their area.*
>
> *Ensure air quality is a consideration when assessing planning applications and, where a significant deterioration in air quality is predicted, put in place conditions to mitigate their effects.*

Ensure that wherever possible all new developments are accessible by alternative means of transport, minimising the need to travel by supporting mixed development schemes.

Require monitoring/modelling to be carried out to establish the potential impact of any development likely to have a significant impact on local air quality."

4.1.9. Policy CS16 of the CBC Local Plan (CBC, 2015)**Error! Reference source not found.** tates:

"We will adapt to and mitigate against the effects of climate change by encouraging sustainable design and construction and the provision of renewable energy, where it does not make development unviable.

We will do this by:

Supporting new development that protects environmental resources including local air quality and our most versatile agricultural land."

4.1.10. There are other policies which refer directly to air quality within CBC, however, these are specific to certain developments and do not apply to this Scheme.

National Planning Policy Framework 2018

4.1.11. The latest version of the NPPF was published in July 2018 (Ministry of Housing, Communities & Local Government, 2018) and replaces the 2012 version which was current at the time of the assessment. This framework sets out national policies and principles on land use planning. Paragraph 103 of the NPPF states that:

"The planning system should actively manage patterns of growth in support of these objectives [as set out in Table 4.1]*. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health."*

4.1.12. Air quality is considered as an important element of the natural environment. On conserving and enhancing the natural environment, Paragraph 170 states that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by: …

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality …"

4.1.13. Air quality in the UK has been managed through the Local Air Quality Management regime using national objectives. The effect of a proposed development on the achievement of such policies and plans are matters that may be a material consideration by planning authorities, when making decisions for individual planning applications. Paragraph 181 of the NPPF states that:

> *"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."*

4.1.14. The air quality assessment undertaken for the Zouch Bridge scheme demonstrates that the scheme is in line with the air quality polices of the new NPPF and therefore no new air quality assessment is required.

Construction Phase Assessment

Methodology

4.1.15. The air quality assessment of the construction phase for the Scheme considered the potential for adverse effects on nearby sensitive receptors (e.g. residential properties) from fugitive emissions of particulate matter (fugitive emissions are those that result from diffuse sources, rather than from a specific emission point e.g. a car exhaust or stack). The primary dust generating activities during the construction phase consist of:

- demolition;
- earthworks, including the handling, working and storage of materials;
- construction activities; and
- track-out (the transfer of dust-making materials from the Site onto the local road network).

4.1.16. Particulate matter in air is made up of particulates of a variety of sizes. In this assessment the term 'dust' is used to mean particulate matter in the size fraction 1–75 µm (micrometer) in diameter, as defined in BS 6069:1994 (British Standards Institute, 1994).

4.1.17. The size fraction called 'PM_{10}' is composed of material with an aerodynamic diameter of less than 10 µm in diameter and overlaps with the size fraction for dust. Air quality objectives for PM_{10} have been set for the protection of human health and the short-term, 24-hour mean objective for airborne concentrations of PM_{10} is the appropriate Air Quality Strategy Objective for assessing the potential impact on health of short-term fugitive emissions from construction sites.

4.1.18. Dust impacts are considered in terms of the change in airborne concentration and the change in the rate of deposition of dust onto surfaces. The Institute of Air Quality Management (IAQM) adopts a broad definition of 'dust' that includes the potential for changes in airborne concentration, changes in deposition rates and the risk to human health and public amenity when considering the significance of effects from emissions of fugitive particulate matter. For the Scheme air quality assessment, specific reference was made to the impacts associated with specific size fractions (dust, PM_{10}), before considering the overall effect on receptors using an approach that is consistent with the IAQM's guidance (IAQM. 2014).

4.1.19. When assessing the impact of dust emissions generated during construction works, an assessment is required where there is:

- A human receptor within 350 metres (m) of the site boundary;
- An internationally designated ecological receptor within 50 m of the site boundary; or
- A human or internationally designated ecological receptor within 50 m of the route used by construction vehicles on the public highway (over a distance of 500 m from the site entrance).

4.1.20. Potential dust sensitive receptors were identified from publically available aerial photography and a site walk-over. Within 350 m of the Site boundary and within 50 m of the route used by construction vehicles (the A6006), there are a number of residential properties (human receptors).

4.1.21. The identification of potential sensitive nationally (e.g. Sites of Special Scientific Interest (SSSI)) or internationally designated (e.g. Special Area of Conservation (SAC)) ecological receptors has been undertaken in line with current guidance (IAQM, 2014). There are no nationally or internationally designated ecological receptors within 50 m of the Site boundary, within 50 m from a route used by construction vehicles on the public highway or up to 500 m from the Scheme.

4.1.22. The IAQM guidance provides criteria in order to determine the sensitivity of the area around the construction site to dust soiling effects and the sensitivity of people to the health effects of PM. In terms of the sensitivity of the receptors, possible residential properties are located in close proximity to the Scheme and the construction routes. These receptors are considered to be of high sensitivity for effects on both amenity and human health. All other receptors in the study area can be considered to be of medium sensitivity to impacts on both amenity and human health. Taking into account the proximity of sensitive receptors to the Scheme, and existing PM_{10} concentrations in the area, the study area as a whole is considered to be of a medium sensitivity to impacts on dust soiling and human health.

4.1.23. The IAQM guidance sets out the following examples of how a dust magnitude could be classified. Not all criteria need to be met for a particular size category, and other criteria can be used where required for a particular assessment.

Table 4.2: Construction Magnitude Classification

Stage of Works	Small	Medium	Large
Demolition	Total building volume <20,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10 m above ground, demolition during wetter months.	Total building volume 20,000 m^3 – 50,000 m^3, potentially dusty construction material, demolition activities 10-20 m above ground level.	Total building volume >50,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20 m above ground level.
Earthworks	Total site area <2,500 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <20,000 tonnes, earthworks during	Total site area 2,500 m^2 – 10,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m - 8 m in height, total material moved 20,000 tonnes	Total site area >10,000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8

Stage of Works	Small	Medium	Large
	wetter months.	– 100,000 tonnes.	m in height, total material moved >100,000 tonnes.
Construction	Total building volume <25,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).	Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching;	Total building volume >100, 000 m^3, on site concrete batching, sandblasting
Trackout*	<10 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m.	10-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m	50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m;

** Defined in IAQM guidance as "The transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction/demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site."*

4.1.24. For effects on amenity (including those associated with dust), the aim is to bring forward a construction scheme, including mitigation measures if necessary, that avoids the potential for complaints to be generated as a result of the Scheme.

4.1.25. Experience in the UK (IAQM, 2014) is that good site practice is capable of mitigating the impact of fugitive emissions of particulate matter effectively, so that in all but the most exceptional circumstances, effects at sensitive receptors can be controlled to ensure that effects are of negligible or slight adverse significance (i.e. 'not significant'). This process can be managed through the preparation and implementation of a Construction Environmental Management Plan (CEMP) which will be prepared for the Scheme before construction commences.

4.1.26. Construction dust effects generally occur when high risk dust generating activities are undertaken that coincide with adverse meteorological conditions. Therefore, even without mitigation, any impact would be limited to events that are infrequent and short-term in nature.

4.1.27. The construction phase assessment of the Scheme also considered the potential for increases in the number of vehicles on the public highway for the duration of the construction works. This was considered by comparing the anticipated additional HGV movements that would be accessing the site each day against the criteria set out by Environmental Protection UK (EPUK) in their guidance (EPUK, 2010) to establish the need for an air quality assessment for the construction phase of a development. This criteria is:

> *"Large, long-term construction sites that would generate large HGV flows (>200 per day) over a period of a year or more."*

Baseline Conditions

4.1.28. A background level of dust exists in all urban and rural locations in the UK. Dust can be generated on a local scale from vehicle movements and from the action of wind on exposed soils and surfaces. Dust levels can be affected by long range transport of dust from distant sources into the local vicinity.

4.1.29. This baseline rate of soiling is considered normal and varies dependent on prevailing climatic conditions. The tolerance of individuals to deposited dust is therefore shaped by their experience of baseline conditions.

4.1.30. Existing local sources of particulate matter includes wind-blown dust from exhaust emissions from road vehicles, brake and tyre wear from road vehicles, dust from agricultural sources and the long range transport of material from outside the study area.

Assessment of Construction Effects

4.1.31. The detailed nature and duration of specific aspects of the construction works were unknown at the time of the assessment. In the absence of detailed construction information, the assessment of construction dust effects has made several assumptions on the likely activities to be undertaken during the construction works.

4.1.32. As with the majority of construction projects of this type, the early phases of the works are likely to involve demolition, excavations and earthworks, temporary stockpiling of potentially dusty materials and the use of unsurfaced haul roads. In addition, a concrete block set within the River Soar will be broken up and removed before construction of the new bridge commences. These activities are likely to be the principal sources of dust during these early phases. During the middle phases, when the bridge is erected, the principal sources of dust are likely to be from the cutting and grinding of materials and the movement of construction related road vehicles. The latter phases, when the majority of the infrastructure is complete, will involve the landscaping and finishing works. During these phases, the principal sources of dust will include the storage, handling and movement of materials generated during the associated earthworks.

4.1.33. Potential dust sensitive receptors that could be impacted on as a result of the construction works are a mix of residential and commercial premises, including Loughborough Boat Club. Dust sensitive receptors are located along Zouch Road and Main Street. The sensitivity of these receptors ranges from high, when considering impacts on short-term concentrations of PM_{10} and dust deposition at residential locations, to medium, when considering impacts on dust deposition and soiling at food retailers and leisure facilities (Loughborough Boat Club).

4.1.34. With regard to demolition work associated with the Scheme in relation to the removal of the existing bridge; these works will take place after the construction of and during operation of the replacement bridge. In line with guidance set out by the IAQM, the potential dust magnitude of this demolition work was assessed as medium (potential for dust release from demolition activities), with the sensitivity of the area to demolition dust also assessed as medium (1-10 properties within 20m of demolition work). Therefore the combined risk of dust impacts from this activity was also medium. Low background concentrations of PM_{10} (less than 24 $\mu g/m^3$) mean the area has a low sensitivity to potential increases in concentrations, and the overall risk of impacts on PM_{10} concentrations was assessed as low.

4.1.35. Similarly for earthworks and construction, the magnitude of emissions from these activities was assessed as medium (estimated 7,000 m^2 of earthworks including bridge replacement and removal of existing road along with less than 25,000 m^3 of construction work) with the sensitivity of the area to dust soiling also medium (1-10 properties within 20m of demolition work). Therefore the combined risk of dust impacts from this activity was medium. Low background concentrations of PM_{10} (less than 24 $\mu g/m^3$) mean the area has a low sensitivity to potential increases in concentrations, and the overall risk of impacts on PM_{10} concentrations was assessed as low.

4.1.36. For trackout, the magnitude of emissions was assessed as large (approximately 100 vehicle movements per day at the peak) with the sensitivity of the area to dust soiling from track-out as medium. The combined risk of dust impacts from this activity was medium. Low background concentrations of PM_{10} (less than 24 µg/m^3) mean the area has a low sensitivity to potential increases in emissions as a result of track-out, and the overall risk of impacts on PM_{10} concentrations was assessed as negligible.

4.1.37. Overall, the implementation of best practice dust control measures during the site works, which are standard on all well managed construction sites across the UK and which will be put in place for the Scheme through the CEMP, would minimise the effects of the construction phase dust emissions so that they are negligible to slight adverse at worst, which is not considered to be significant.

4.1.38. For construction phase traffic it was estimate that there would be an average of 15 HGVs accessing the site per day (30 two-way vehicle movements), up to a maximum of 50 (100 two-way vehicle movements). This is well below the 200 vehicles per day EPUK criteria, therefore the effect of construction vehicle emissions is anticipated to be negligible and was therefore not considered further in the assessment of the Scheme.

Mitigation of Construction Effects

4.1.39. The impact assessment summarised above has identified a medium risk of dust impacts occurring as a result of the construction of the Scheme.

4.1.40. As such, mitigation measures are required to reduce the risk of a dust impact to the extent that a significant effect will not occur and these will be as contained within the CEMP. Mitigation measures as suggested by relevant guidance (IAQM, 2014) for the various stages of construction phase activities are detailed in the air quality assessment report. The guidance states that these measures should be implemented where practical throughout the works.

Operational Assessment

Methodology

4.1.41. The air quality assessment for the Scheme specifically considered the impact of the emissions from roads on the long-term (annual) and short-term NO_2, PM_{10} and $PM_{2.5}$ concentrations at local air quality sensitive receptors in the vicinity of the Scheme for the future opening year.

4.1.42. The concentration of pollutants emitted from road traffic associated with the Scheme, and the impact at the roadside or at sensitive receptors will be influenced by a number of factors. These include background pollution levels, emissions of pollutants from road traffic, which are dictated by traffic flow rates, vehicle flow composition and speed. The effect of pollutants from road traffic reduces with distance from the point of release, and beyond 200m these are likely to have reduced to concentrations equivalent to background concentrations.

4.1.43. To undertake the assessment of road traffic emissions during the operational phase, the dispersion model software 'ADMS-Roads' (V4.0.1, current at the time of the assessment) was used to quantify pollution levels at sensitive receptors. ADMS-Roads is a modern dispersion model that has an extensive published track record of use in the UK for the assessment of local air quality impacts, including model validation and verification studies (CERC, 2010).

4.1.44. Operational impacts from road traffic emissions have been quantified at a number of existing receptors in the vicinity of the Scheme. Each receptor chosen represents the anticipated maximum level of exposure that could be experienced by other receptors in their vicinity.

4.1.45. An objection to the scheme has been raised by Mr Farrow (discussed in section 5 below), who lives at 25 Main Street, Zouch, adjacent to the Scheme. This property is receptor R3 in the air quality assessment.

4.1.46. The scenarios considered within the dispersion modelling exercise for road traffic emissions:

- Opening year (2018) future baseline (i.e. do-nothing) (without the Scheme in operation); and
- Opening year (2018) 'do-something' scenario (with the Scheme in operation).

4.1.47. Traffic data for the above scenarios was provided by Leicestershire County Council (LCC). Traffic flows and composition are not anticipated to change with the scheme in place. The key differences between the two scenarios above for air quality are the changes to the horizontal alignment of the bridge and approach roads and changes in design and changes in speeds due to the speed limits being introduced with the scheme. Whilst there is a change in vertical alignment with the proposed scheme, the air quality assessment takes a worst case approach and assumes that everything is at grade.

4.1.48. All relevant receptors that have been selected to represent locations where people are likely to be present are based on impacts on human health. The air quality objective values have been set at concentrations that provide protection to all members of society, including more vulnerable groups (such as the very young, elderly or unwell). Therefore, the sensitivity of receptors was considered in the definition of the air quality objective values and thus no additional subdivision of human health receptors on the basis of building or location type is necessary.

4.1.49. With regard to road traffic emissions, the change in pollutant concentrations, with respect to future baseline concentrations (i.e. Do Nothing scenario), has been described at receptors that are representative of exposure to impacts on local air quality within the study area. The absolute magnitude of pollutant concentrations in the baseline and the 'Do Something' scenario is also described, and this is used to identify the risk of the air quality objective values being exceeded in each scenario.

4.1.50. For consideration of a change in NO_2, PM_{10} and $PM_{2.5}$ annual mean concentrations of a given change, the EPUK and IAQM have published recommendations for describing the effects of such impacts at individual receptors (IAQM/EPUK, 2015) which was current at the time of the assessment.

4.1.51. The significance of the reported effects was then considered for the Scheme in overall terms. The potential for the Scheme to contribute to or interfere with the successful implementation of policies and strategies for the management of local air quality are considered if relevant, but the principal focus was in determining the significance of any change to the likelihood of future achievement of the air quality objective values set out in Table 4.1 for the following pollutants:

- Annual mean nitrogen dioxide (NO_2) concentration of 40 µg/m^3;
- Annual mean particulate matter (PM_{10}) concentration of 40 µg/m^3;
- Annual mean fine particulate matter ($PM_{2.5}$) concentrations of 25 µg/m^3;
- 24-hour mean PM_{10} concentration of 50 µg/m^3 not to be exceeded on more than 35 days per year; and
- 1-hour mean NO_2 concentration of 200 µg/m^3 not to be exceeded more than 18 times per year.

4.1.52. The achievement of local authority goals for local air quality management are directly linked to the achievement of the air quality objective values in Table 4.1 and as such this assessment focused on the likelihood of future achievement of the air quality objective values as a result of the Scheme.

4.1.53. In terms of the significance of the consequences of any adverse impacts, an effect is reported as being either 'not significant' or as being 'significant'. If the overall effect of the development on local air quality or on amenity is found to be 'moderate' or 'major' this is deemed to be 'significant'. Effects found to be 'slight' are considered to be 'not significant', although they may be a matter of local concern. 'Negligible' effects are considered to be 'not significant'.

Baseline Conditions

4.1.54. The Scheme is not located in an area of poor air quality (i.e. Air Quality Management Area (AQMA).

4.1.55. The closest automatic monitor to the site of the Scheme is situated at, and owned by, East Midlands Airport. The air quality at this monitoring location has potential to be comparable to that of the site of the Scheme; however the automatic monitor is proximal to low level air traffic occurring at East Midlands Airport and so concentrations are likely to be higher than these around the Scheme.

4.1.56. Measured pollutant concentrations at this site between 2011 and 2014 (the data available at the time of the assessment) ranged from 18.3 µg/m^3 (annualised value from 9 months of data in 2014) to 28.5 µg/m^3 in 2012 for NO_2. The range measured for PM_{10} for the same period was between 17.1 µg/m^3 (annualised value from 9 months of data in 2014) to 19.3 µg/m^3 in 2011. These concentrations are all well below the respective air quality objective values.

4.1.57. Defra publish mapped background data for annual mean NO_2, PM_10 and $PM_{2.5}$ based on 1km by 1km grid squares. The background concentrations for the area around the Scheme for 2015 as used in the air quality assessment were 14.7 µg/m^3 for NO_2, 17.9 µg/m^3 for PM_{10} and 11.2 µg/m^3 for $PM_{2.5}$. For annual mean NO_2 this is lower than those measured at East Midlands Airport, with annual mean PM_{10} falling in the range measured at that site.

Assessment of Operational Effects

4.1.58. The assessment has been carried out in accordance with the methodology set out above and weighed against the air quality objectives following guidance set out by the IAQM/EPUK to determine the significance of the predicted effect on air quality.

4.1.59. Annual mean concentrations of NO_2 are predicted to be below the objective value (refer to Table 4.1) at all receptors within the study area (the highest concentration predicted with the Scheme was 30.2 µg/m^3, almost 10 µg/m^3 below the objective value).

4.1.60. Receptors to the east of the bridge are predicted to experience small or very small increases in annual mean NO_2 concentrations. The largest increase is 1.0 µg/m^3 at the receptor closest to the realigned A6006. These increases are likely due to the closer proximity to the carriageway after the installation of the replacement bridge. At R3 the predicted increase in annual mean NO_2 is 0.9 µg/m^3. As annual mean concentrations of NO_2 are below the objective value at these properties, this is a negligible impact at all receptors.

4.1.61. Receptors to the west of the bridge are predicted to experience reductions in annual NO_2 concentrations of between 5.9 and 0.4 µg/m^3. This reduction in annual mean concentrations of NO_2 is due to the increase in distance of the properties from the carriageway after the installation of the replacement bridge. The largest reductions are predicted at the receptors closest to the A6006. Annual mean concentrations of NO_2 are predicted to be well below the objective value at these properties, and effects are classified as either moderate or slight beneficial. At all other receptors the predicted improvement in annual mean NO_2 concentrations is predicted to be of negligible significance.

4.1.62. Annual mean concentrations of PM_{10} and $PM_{2.5}$ are predicted to be well below the objective value at all receptors within the study area. The highest PM_{10} concentration predicted with the Scheme was 19.2 µg/m^3, more than 20 µg/m^3 below the objective value for PM_{10} and 12.0 µg/m^3 was predicted for $PM_{2.5}$, which is 13 µg/m^3 below the objective value for $PM_{2.5}$).

4.1.63. Receptors to the east of the bridge, are predicted to experience imperceptible changes (less than 1% of the objective) in annual mean PM_{10} and $PM_{2.5}$ concentrations, with the largest change in either pollutant being 0.1 µg/m^3. The largest increase is 0.1 µg/m^3 at the receptor closest to the realigned A6006. These increases are likely due to the closer proximity to the carriageway after the installation of the replacement bridge. As annual mean concentrations of PM_{10} and $PM_{2.5}$ are well below the relevant objective values at these properties, this is a negligible impact.

4.1.64. Receptors to the west of the bridge closest to the A6006 are predicted to experience small reductions in annual mean PM_{10} concentrations of up to 0.6 µg/m^3 and up to 0.4 µg/m^3 for $PM_{2.5}$. Receptors to the west of the bridge but further back from the road are predicted to experience imperceptible reductions (less than 1% of the objective) of negligible significance for both pollutants. This reduction in annual mean concentrations of PM_{10} and $PM_{2.5}$ is due to the increase in distance of the properties from the carriageway after the installation of the replacement bridge.

4.1.65. It is noted that there will be additional vegetation planted with the proposed scheme, however this would have no measurable effect on air quality

4.1.66. The overall effect of the Scheme is therefore anticipated to be negligible to moderate beneficial for air quality (NO_2, PM_{10} and $PM_{2.5}$) and not significant overall.

Mitigation of Operational Effects

4.1.67. As air quality effects associated with the operation of the Scheme are predicted to be negligible to moderate beneficial and not to be significant overall, no operational mitigation measures are required.

Conclusions

4.1.68. The above section has set out the relevant planning policy for the air quality assessment, the methodologies utilised for the assessment of air quality effects from the construction and operational phases of the Scheme, baseline conditions around the Scheme, the assessment of these effects and the proposed mitigation measures for air quality where required.

4.1.69. Overall, with the implementation of best practice dust control measures during the site works, which are standard on all well managed construction sites across the UK, effects of the construction phase are anticipated to be controlled such that dust emissions are negligible to slight adverse at worst, which is not considered to be significant.

4.1.70. Operationally, the Scheme is not considered to be significant for air quality as only negligible to moderate beneficial effects are predicted, at concentrations well below air quality objectives.

4.1.71. The overall effect of the Zouch Bridge Scheme is therefore considered to be not significant for either the construction or operation of the Scheme. The Scheme therefore complies with relevant air quality planning policy.

5. Issues Raised By Objectors

Mr R Farrow

Grounds of Objection

5.1.1. Mr Farrow lives at 25 Main Street, Zouch, adjacent to the Scheme.

5.1.2. Mr Farrow raises a number of issues. One of these is relevant to air quality:-

- An alternative is suggested that the bridge be replaced on its existing line with temporary diversions of traffic.

Response

5.1.3. Mr Farrow does not raise any specific air quality issues however the suggestion to build the bridge at it's current location with temporary diversions of traffic may affect air quality.

5.1.4. The anticipated air quality effects of the alternative existing line scheme have been discussed and compared with the Scheme in the Alternative Assessment document.

5.1.5. In summary for the construction phase the alternative Scheme would result in no significant differences in air quality in the immediate area of the scheme, but would result in additional air quality deterioration over a wider area due to traffic diversions, however this deterioration is considered unlikely to be significant for air quality.

5.1.6. In the operational phase there is, at worst, only a small deterioration in air quality with the Scheme compared to the alternative Scheme. This is not significant and with either Scheme air quality is predicted to be very good at the properties around Zouch Bridge.

6. Summary and Conclusions

6.1.1. In this Proof I have presented the air quality assessment undertaken for the Zouch Bridge scheme and the results of that assessment.

6.1.2. I have concluded that with the implementation of best practice dust control measures during the site works, which are standard on all well managed construction sites across the UK, effects of the construction phase are anticipated to be controlled such that dust emissions are negligible to slight adverse at worst, which is not considered to be significant.

6.1.3. I have also concluded that operationally, the Scheme is not considered to be significant for air quality as only negligible to moderate beneficial effects are predicted, at concentrations below air quality objectives.

6.1.4. I have concluded that the overall effect of the Scheme is therefore considered to be not significant for either the construction or operation of the Scheme. The Scheme therefore complies with relevant air quality planning policy.

6.1.5. I have then considered the objection of Mr Farrow in relation to air quality and concluded that the construction of the alternative scheme is likely to have similar construction dust effects as the Scheme. However, I have also concluded that there is potential for adverse effects on air quality at both human and nationally designated ecological sensitive receptors in the wider area due to traffic diversion during the construction phase when the A6006 is closed. These effects are not anticipated to be significant for human due to good air quality along the diversion route. There is potential for significant adverse effects on nationally designated ecological sites, however these effects will last for a relatively short time.

6.1.6. Additionally I have concluded that the operation of the alternate scheme is anticipated to be neutral for air quality.

6.1.7. Overall I have concluded that the Scheme being progressed by LCC is considered to be acceptable in terms of air quality effects.