

Adran yr Economi a'r Seilwaith  
Department for Economy and Infrastructure



Llywodraeth Cymru  
Welsh Government

**THE CHESTER TO BANGOR TRUNK ROAD (A55) (JUNCTIONS 16 AND 16A  
IMPROVEMENT REALIGNMENT AND SLIP ROADS) ORDER 202-**

**THE CHESTER TO BANGOR TRUNK ROAD (A55) (JUNCTIONS 16 AND 16A  
IMPROVEMENT REALIGNMENT AND SLIP ROADS) (SIDE ROADS) ORDER 202-**

**THE WELSH MINISTERS (THE CHESTER TO BANGOR TRUNK ROAD (A55)  
(JUNCTIONS 16 AND 16A IMPROVEMENT REALIGNMENT AND SLIP ROADS))  
COMPULSORY PURCHASE ORDER 202-**

**SUMMARY PROOF OF EVIDENCE**

**Note: See Document Reference WG 1.10.02 for full evidence and referencing  
Graham Thomas Harker CEng, MIMechE, MIEEnvSc, MIAQM, BSc(Eng)**

**WELSH GOVERNMENT, AIR QUALITY**

**DOCUMENT REFERENCE: WG 1.10.01**

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## **1. Author**

- 1.1 I am Graham Thomas Harker. I lead the air quality discipline of Ramboll UK Limited. I am a Chartered Mechanical Engineer (CEng), Member of the Institution of Mechanical Engineers (MIMechE), Member of the Institution of Environmental Sciences (MIEnvSc) and the Institute of Air Quality Management (MIAQM). I have over 20 years of experience in environmental regulation and consultancy.
- 1.2 My Proof of Evidence provides an overview of the air quality aspects of the Junction 16 Scheme and sets out the reasons for the proposed environmental mitigation.
- 1.3 I have been assisted by colleagues from within the project team in the various tasks that are reported in this document. Colleagues are also presenting evidence within their specialist environmental expertise.

## **2. Summary of Regulatory and Policy Framework**

- 2.1 Relevant Legislation, Policy and Guidance applicable to air quality were set out in Sections 12.2 to 12.5 of the Environmental Statement (ES).
- 2.2 Paragraphs 12.4.1 to 12.4.8 of the ES provides the Air Quality Objectives (AQOs) for nitrogen dioxide (NO<sub>2</sub>) and fine particulate matter (PM<sub>10</sub>) which are set in Regulations for the protection of human health.
- 2.3 The objectives apply at locations of relevant exposure which are defined in relation to the potential time period over which exposure may occur.
- 2.4 Section 12.5 of the ES provides a summary of the guidance used to inform the assessment. The primary guidance informing the construction dust impact assessment is that issued by the Institute of Air Quality Management (IAQM) as described in Paragraph 12.5.1 of the ES.
- 2.5 The primary guidance informing the assessment of road traffic emissions is the Design Manual for Roads and Bridges (DMRB) HA 207/07 as described in Paragraph 12.1.5 of the ES.
- 2.6 Subsequent to the assessment the DMRB guidance was updated to LA105 Air Quality; application of the guidance would not change the conclusions of the assessment.

### **3. Assessment of Effects**

#### **Consultation**

- 3.1 Paragraphs 12.6.1 to 12.6.3 of the ES describe the consultation undertaken for the scheme.

#### **Sources of Effects**

- 3.2 Paragraph 12.1.2 of the ES provides information on the sources of air quality effects of the scheme. These are dust and PM<sub>10</sub> during the construction period and emissions associated with road traffic (NO<sub>2</sub> and PM<sub>10</sub>) during the operational period.

#### **Method**

- 3.3 The methodology for the assessment of construction impacts is set out in Section 12.7 of the ES. The assessment of construction dust impacts was undertaken in accordance with the IAQM construction dust guidance.
- 3.4 The effects of construction traffic were scoped out of the assessment as the construction vehicle movements were below the DMRB threshold for an assessment to be necessary.
- 3.5 The impacts of the operation of the scheme have been assessed by detailed atmospheric dispersion modelling of road traffic emissions as described in Paragraphs 12.8.1 to 12.8.12 of the ES.
- 3.6 The pollutant concentrations with the development in place as well as the development contribution are used to determine the significance of the impact as set out in Paragraphs 12.8.15 to 12.8.18 of the ES in accordance with IAQM guidance on planning. The significance of ecological impacts was judged against DMRB criteria as described in Paragraph 12.8.25 of the ES.
- 3.7 Defra produces a number of tools which can be used for the modelling process. These tools are periodically updated by Defra and the latest version of the tools available at the time of the assessment were used.
- 3.8 Fourteen human health receptor locations were chosen as described in Paragraphs 12.8.13 to 12.8.14 of the ES. Ecological receptors were chosen in accordance with DMRB criteria as described in Section 12.8.19 to 12.8.24 of the ES.

#### **Baseline**

- 3.9 Baseline conditions at human health receptor locations are described in Sections 12.10 to 12.14 of the ES. All of the measured and predicted data were well below the air quality objectives.

- 3.10 Baseline conditions at ecological receptors are described in Section 12.15 of the ES. The baseline nitrogen deposition and nitrogen acid deposition are above the respective critical loads.

#### **Assessment of Construction Effects**

- 3.11 The assessment of Construction Effects is described in Section 12.16 of the ES.
- 3.12 The scheme was found to be medium risk for earthworks and construction dust impacts and low to negligible for human health impacts.

#### **Assessment of Operational Effects**

- 3.13 The impacts on human health receptors are described in Paragraphs 12.17.1 to 12.17.4 of the ES. The overall effect was judged to be not significant.
- 3.14 The impacts on ecological receptors are described in Paragraphs 12.17.5 to 12.17.7 of the ES. The overall effect was judged to be not significant.

#### **Mitigation and Enhancement**

- 3.15 Mitigation measures to control dust emissions are described in Paragraphs 12.18.1 and Table 12.18 of the ES. The recommended dust mitigation measures would form part of a Construction Environmental Management Plan (CEMP) for the scheme.
- 3.16 The operational mitigation measures are described in Paragraphs 12.19.1 to 12.19.2 of the ES. No additional traffic mitigation is required to reduce the direct effects of the Scheme on local air quality.

#### **Residual Effects**

- 3.17 The construction and operational phase residual effects are described in Section 12.20 of the ES and are not significant.

#### **Cumulative Effects**

- 3.18 Cumulative effects are described in Section 12.21 of the ES. Both construction and operational phase cumulative effects are not significant.
- 3.19 Natural Resources Wales (NRW) concurred with the conclusions of the assessment outlined in Summary Section (2.22) of the ES.

## **4. Objections to the Scheme**

- 4.1 Objections have been made that raise matters that fall within the scope of my proof of evidence.
- 4.2 An objection has been made that the scheme will increase pollution around the junctions due to the replacement of the roundabouts. It is not agreed that the scheme will increase pollution. Vehicle engines are more efficient when driving at a constant speed. Driving with less acceleration and deceleration and stop-and-go would improve fuel consumption, reduce exhaust and brake-wear and tyre-wear emissions and improve air pollution. Tyre-wear is exacerbated by the effect of the yellow rumble strips on the approach to the roundabout; the removal of these would reduce this tyre-wear and thus result in less particulates being emitted.
- 4.3 The replacement of the roundabout with slip roads and an overbridge would reduce congestion and increase the average speed by promoting free flowing traffic, resulting in an overall improvement in air pollution and reduction in vehicle emissions is due to the changes in driving style.
- 4.4 A suggestion has been made by objectors that as an alternative to the Scheme, the speed limit on the road should be lowered to 50 mph and that this would have the benefit of reducing emissions. Lowering the speed limit to 50 mph from 70 mph would have the effect of lowering emissions in free-flowing traffic. However, congestion at the roundabout would still remain and one would still be left with the increased emissions caused by the traffic having to slow down, stop and then accelerate.

## **5. Conclusion and Declaration**

- 5.1 My proof of evidence includes facts which I regard as being relevant to the opinions which I have expressed, and the Inquiry's attention has been drawn to any matter which would affect the validity of that opinion.
- 5.2 As air quality lead I have supervised the preparation of the Air Quality ES Chapter (WG 3.01.01) and sought, with the engineering and other environmental specialists in the team, to minimise impacts of the Scheme and to optimise the effectiveness of proposed mitigation.
- 5.3 In my opinion the Air Quality Assessment, has been carried out and published in accordance with legislation and professional guidance.
- 5.4 In my opinion the development of measures to mitigate the Air Quality effects of the Scheme are effective, justifiable and achievable.
- 5.5 I believe the facts I have stated in this proof of evidence are true and that the opinions expressed are correct.
- 5.6 I understand my duty to the Inquiry to assist it with matters within my expertise and believe that I have complied with that duty.