

**M4 (Junctions 3 to 12) (Smart Motorway)
Development Consent Order Application
Slough Borough Council
Written Summaries/Evidence of oral submissions
put at Specific Issue Hearing dealing with matters
relating to the environment
17th and 18th November 2015**

**26th November 2015
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1. SLOUGH CONTEXT

- 1.1. Slough is a compact densely built-up Borough with a population of some 143,000 which is predicted to rise by at least 10,000 residents by 2022. The M4 fringes the southern edge of the town and runs approximately parallel to the A4, the historic route between London and Bath. Three motorway junctions serve Slough:
 - Junction 7 linking with the A4 via the Huntercombe Spur;
 - Junction 6 linking with the A355 which connects southwards with Windsor and northwards with Slough Trading Estate, South Buckinghamshire and the M40; and
 - Junction 5, the Langley Interchange, linking with the A4 and giving access to Heathrow and Slough town centre.
- 1.2. Between Junctions 7 and 6 the M4 runs close to residential areas and public open space at Cippenham (Mercian Recreation Ground). East of Junction 6 the motorway fringes residential areas and school grounds at Chalvey and Herschel Park. East of Junction 5 it severs the built up area, with Langley to the north and Brands Hill to the south. Air quality and noise are major concerns and Slough Borough Council (SBC) is anxious to protect its residents and others from negative impacts arising from the Smart Motorway scheme.
- 1.3. Because of its proximity to London, Heathrow and the M25, and being home to the extensive Slough Trading Estate, the Borough experiences high levels of traffic. Traffic leaving or joining the M4 at Slough regularly causes queuing and congestion on the local road network during peak periods. Occasionally, heavy congestion or an incident on the M4 can bring traffic in Slough to a virtual standstill as drivers divert off the motorway. SBC notes from the Socio-Economic Report (2.1.1 APP-090) that the M4 typically carries over 130,000 vehicles per day and that this is forecast to increase to an average 160,000 vehicles per day over the next 20 years. Unless properly managed, this additional traffic could significantly increase pressures on the local road network and create additional noise and air pollution.
- 1.4. Details comments were submitted within SBC Local Impact Report and SBC is still of the view the comments are relevant.

A. Preliminary Matters (Q1, Q2, Q3)

- 1.5. SBC is generally satisfied with the methodology applied within the Environmental Impact Assessment by Highway England and its consultants. However, SBC would like to have further discussions with HE with respect to localised environmental impacts on our local road network because SBC is of the view these impacts, particularly junction and highway capacity and air pollution require more detailed assessments.
- 1.6. SBC along with its neighbours LB Hillingdon, South Bucks DC, Bucks CC has compiled a list of significant infrastructure projects and schemes that should be taken into account as part of a cumulative impact assessment.
- 1.7. The Goodman Colnbrook (SIFE) development will impact significantly on the Brands Hill AQMA 2, and also on the Smart Motorway. SBC would like HE to demonstrate the impact the change in concentrations of air quality on all our residential receptors taking both schemes into account, as well as determining the significance of the combined change.

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B. Air Quality (Q2, Q17, Q28)

- 1.8. SBC appointed air quality expert, Dr Scott Hamilton has submitted detailed evidence with respect to air quality impacts on our residents as a result of the scheme, taking into account uncertainty in relation to air quality modelling. We have proposed mitigation be considered at residential receptors where the predicted levels exceeding $36\mu\text{g}\text{m}^{-3}$ this would result in a significant increase in SBC residential receptors affected by the scheme opening in 2022. We would expect a continuous air quality station to be installed next to our residential properties in Spackmans Way, where a number of minor exceedences have been predicted by the HE air quality consultant at the year of opening,
- 1.9. Air quality is a material planning consideration and a significant public health issue affecting the health of hundreds of thousands of the general population in England and potentially thousand of residents in Slough who live within Air Quality Management Areas. The principal cause of poor air quality in Slough is from local road traffic emissions. The principal cause of poor air quality within the (Air Quality Management Area 1) located in Slough along sections it shares with the M4 is road traffic emissions from the M4. All of SBC, AQMAs have been declared due to breach the National Air Quality Objective for annual nitrogen dioxide (NO_2).
- 1.10. SBC has a comprehensive air quality monitoring network in place including monitoring air quality within AQMA 1, M4 Air Quality Management Area the results are presented in table 1 below and clearly illustrate that sites are consistently breaching the National Air Quality Objectives/EU limits (figures in red)

Table 1 Slough Borough Council Air Quality Monitoring Network M4 (AQMA 1)

Site	M4 AQMA	Distance From M4	Air Quality Data Sets for M4 AQMA 1 (2009 - 2013)							5 year Annual Average Mean ($\mu\text{g}/\text{m}^3$)
			Grid Reference		Ratified					
			X	Y	2009 Annual Mean ($\mu\text{g}/\text{m}^3$)	2010 Annual Mean ($\mu\text{g}/\text{m}^3$)	2011 Annual Mean ($\mu\text{g}/\text{m}^3$)	2012 Annual Mean ($\mu\text{g}/\text{m}^3$)	2013 Annual Mean ($\mu\text{g}/\text{m}^3$)	
Chalvey Air Quality Monitoring Station	Yes	45m (north)	496562	179019	44.4	41.8	44.2	39.0	37.7	41.2
Paxton Avenue	Yes	30m (north)	496050	179258	40.0	38.0	38.9	47.5	42.1	41.3
Spackmans Way	Yes	40m (north)	496272	179187	39.6	41.0	44.0	43.4	43.6	42.3
Ditton Road	Yes	60m (north)	500851	177890	38.6	40.9	40.5	41.0	37.2	39.6
Chalvey Station	Yes	45m (north)	496562	179019	41.4	40.3	41.1	40.8	38.0	40.3
Winvale Grampian Way	Yes	15m (north)	497488	179090	42.1	40.9	46.9	48.3	44.5	44.5
Torridge Way	Yes	50m (north)	501382	178101	42.1	42.3	48.1	45.1	43.3	44.2
Torridge Road	Yes	30m (south)	501637	177999	36.6	47.4	41.2	39.5	43.3	41.6

- 1.11. The Government primary driver for action on air quality is the impact it can have on health and the environment. The draft plans set out actions planned, being implemented and already taken at local level, regional and national level to meet the annual and hourly EU

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nitrogen dioxide (NO₂) limit values over the **shortest possible time**. However, it clear that local breaches will fall on local authorities to remedy and SBC is concerned that without sufficient mitigation the M4 Smart scheme will delay compliance.

- 1.12. Slough falls within the South East UK 0031 Zone, and has submitted to DEFRA 40 local measures to improve NO₂. The government predict the South East Zone will be compliant with the EU limits by 2020, but only if Euro 6 emission standards perform as modelled and there is significant concerns that, real world Euro 6 passenger diesel cars emissions standards are not performing as modelled in which case compliance may not be reached by 2020 as the Government currently predicts.
- 1.13. Additionally, SBC have significant concerns regarding the increase in local road traffic through the Slough strategic network which is already at capacity at a number of junctions and experiences heavy congestion during peak hours. Slough over the next 3 years (2015 – 2017) will be investing over £18 million in widening the A332 corridor and A355 as well as the A4 to provide a dedicated bus lane. All these schemes are aimed at reducing congestion, improving traffic flow, improved journey reliability, facilitating regeneration, promoting economic growth, and aiding the modal shift to mass transport (buses) and improving air quality. SBC are concerned the M4 Smart scheme will jeopardise the effectiveness of these schemes, through significant increase in local traffic flows. Therefore SBC believes that air quality impact assessments are required for all its Air Quality Management Areas which results in additional traffic flows above 100 AADT as a result of the scheme.

Statement of Common Ground

- 1.14. The HE within the draft SoGC issued to SBC and yet to be accepted (under Matter Not Agreed section 4.8 'it is not agreed that Highway England' will implement speed restrictions as a mitigation measure to alleviate poor air quality as this is not compliant with Highway England Policy". SBC is still waiting for HE to return the SoCG and to jointly sign it, we apologise for the delay in sending this document to the Inspector.

Air Quality Mitigation Measures

- 1.15. HE state in Chapter 6: Table 6.22 that it will be difficult to avoid or reduce or repair or compensated for effect 'as an existing route traditional options to adjust alignment are limited'
- 1.16. However, SBC consider other options are available to mitigate the impact of M4 Smart Motorway on residential receptors include:
 - 1.16.1. Barrier treatment changing the height of the barriers to reduce NO₂ exposure to residential receptors to within EU limits.
 - 1.16.2. Variable speed controls to reduce NO₂ exposure to residential receptors to within EU limits.
 - 1.16.3. As a last resort Boundary treatment of residential facades with carbon filtration ventilation systems to reduce the impact of NO₂ exposure where these are shown to breaching UK Air Quality Objectives/EU limits.
- 1.17. SBC has at its own significant expense, requested its consultants Ricardo-AEA to consider mitigation options to protect our residents from the potential operational impacts of the M4

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Smart Motorway in 2022. Dr Scott Hamilton has submitted his evidence report with relevant references for the Inspectors to consider. The option of barriers is one that SBC believes should be explored further as an effective mitigation measure against poor air quality and to ensure our residents are not experiencing breach of the national air quality objectives/ EU limits at the year of opening 2022.

Construction Traffic Compound 9

- 1.18. SBC also raises concerns about residential receptors that may be affected by construction phase impact, in particular location of Compound 9 within our AQMA 2. This AQMA2 illustrated in Figure 1 below is experiences some of the highest concentrations of air pollution with the Borough.

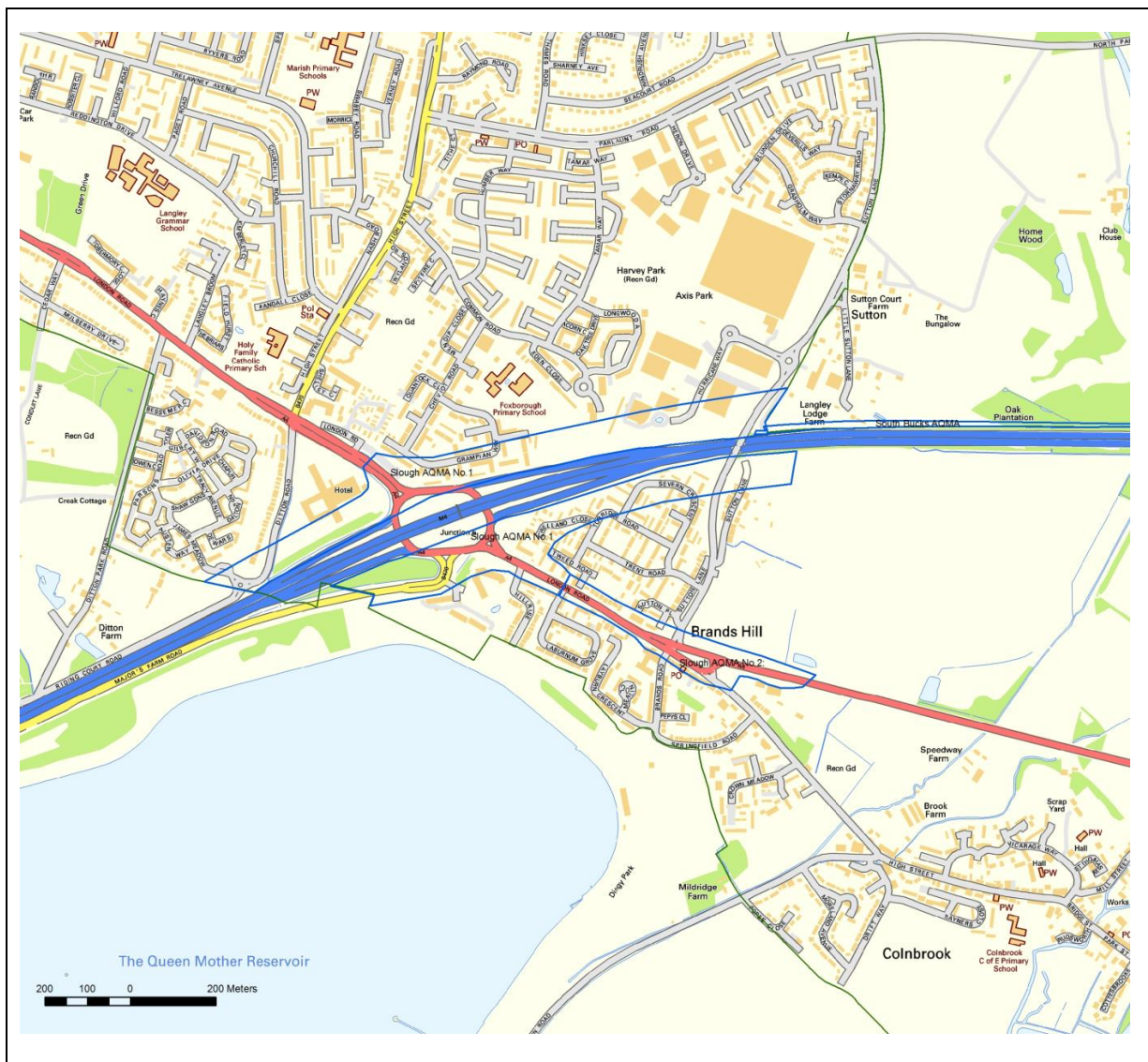
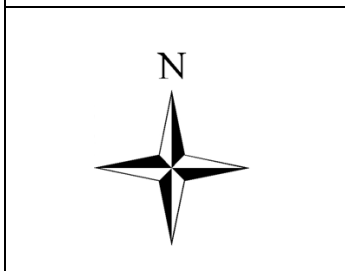


Figure 1: Slough Borough Council: AQMA location– Brands Hill

- 1.19. Details of our diffusion tube network within the Brands Hills AQMA 2 and AQMA M4 are illustrated in Figure 2 below. As compound 9 is located within the within the area between

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Sutton Land and London Road partly within the Brands Hill AQMA2 all construction traffic will need to operate through our AQMA2. The ES has failed to address construction phase impact as result of Construction vehicle movements and the HE has applied the DMRB screening approach (which requires a change in HGV trip flows of more than 200 AADT). SBC does note not recognise DMRB criteria for requiring an air quality assessment on its strategic road network. SBC applied IAQM guidance “Land-Use Planning & Development Control: Planning for Air Quality” which requires a detailed air quality assessment be undertaken where there is a change of HDV flows of more than 25 AADT within or adjacent to an AQMA.



Legend:

- Diffusion tube site



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Figure Error! No text of specified style in document. Slough diffusion tube locations (M4 AQMA 1 and Brands Hill AQMA2)

1.20. SBC has a comprehensive air quality monitoring network in place including monitoring air quality within AQMA 1, M4 and Brands Hill AQMA 2 (where construction compound 9 is located). The results are presented in Table 2 below and clearly illustrate that sites are consistently breaching the National Air Quality Objectives/EU limits (figures in red).

Table 2 Slough Borough Council Air Quality Monitoring Network Brands Hill (AQMA 1 and AQMA 2)

Site	Within Brands Hill AQMA 2	Air Quality Data Sets for M4 AQMA 1 and AQMA 2 Brands Hill (2010 - 2014) Ratified					3 to 5 year Annual Average Mean (ug/m3)
		2010	2011	2012	2013	2014	
	Within M4 AQMA 1	Annual Mean (ug/m3)	Annual Mean (ug/m3)	Annual Mean (ug/m3)	Annual Mean (ug/m3)	Annual Mean (ug/m3)	
Rogans	Yes	54.7	51.1	55.4	56.4	50.9	53.7
Tweed Road	Yes	41.2	38.1	42.0	43.7	39.0	40.8
Brands Hill (A)	Yes	67	61.2	66.7	65.8	53.1	62.8
Brands Hill (B)	Yes			49.1	44.9	42.1	45.3
London Road (B)	Yes			36.6	37.8	38.6	37.7
London Road (C)	Yes	-	-	42.0	37.7	36.6	38.8
Grampian Way	Yes	42.3	48.1	45.1	43.3	42.4	44.2
Torrige Road	Yes	47.4	41.2	39.5	43.3	36.3	41.5

1.21. SBC would recommend the construction compound is re-sited away from our local Air Quality Management Area, where this is not possible, that a detailed air quality assessment is undertaken to determine the impact on our residential receptors, and that HE also incorporates mitigation.

1.22. SBC will require all construction site traffic (HDVs) to be Euro VI compliant and (LDVs to be Euro 6 compliant with a 10% plugged in and electric hybrid vehicles to be used. SBC would expect non-road mobile construction machinery to comply with London NRMM standards for emissions.

C. Noise and Vibration (Q1, Q5, Q9, Q10)

1.24 SBC is satisfied that the HE has identified locations of sensitive receptors and the areas most exposed have been identified in ES Drawing 12.1. However SBC are not satisfied with the robustness of the noise model to accurately predict night time noise impacts at residential

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receptors. This is very relevant to potential disturbance from construction activities during the construction phase of the motorway works.

- 1.25 SBC welcomes the opportunity to comment in detail on the proposed Construction Environmental Management Plan (CEMP) we are particularly concerned about the impact of piling operations (noise and vibration) and are please to see there will be restrictions on times when piling works can be carried out. SBC will continue to work with HE to ensure the CEMP is acceptable to all parties.
- 1.26 SBC is of the opinion that HE **should undertake verification of night noise predictions before the DCO process is ended to determine the accuracy of the model and to readjust night-time noise levels, if required.** SBC recommends ambient night-time noise monitoring to be undertaken at the following receptors (CR-66, CR-72, CR-75, CR-81) and (CROB-11, CROB 17 and CROB 18. This will have relevance to residents who may experience excessive construction noise at night and could be eligible for sound insulation or potentially re-homing.
- 1.27 The HE detailed noise assessment of demolition, piling and construction is a based on BS5228 guidance and references. A detailed noise management plan page 88 to 99 of the Outline revision 1 CEMP, Appendix 4.2A, and set down relevant noise thresholds for noise insulation/temporary re-housing within Table 12.1. The trigger levels at night (22.00 and 07.00) was set at the interim threshold WHO level of 55 dB (A) for noise insulation and 65 dB (A) for temporary housing. **This is why measurement of the ambient noise 1m outside the closest residential receptors is essential well in advance of construction works starting.**
- 1.28 Additionally where the ambient noise is higher than these trigger levels, the ambient noise level will be used as the noise insulation trigger; and the ambient noise level + 10dB will be used as the temporary re-housing trigger level. One of the concerns SBC expressed within its SoCG was the applications for noise insulation or temporary re-housing from occupiers who may have special circumstances. However, residents with children have not been identified and should in our view be considered, particularly in relation to detrimental harm that can be caused to children subject to high levels of noise, even if temporary in nature.
- 1.29 Within Slough the following receptor have been identified as particularly vulnerable during the construction phase from reviewing Appendix 12.3 (App-349) 'Construction noise data and results' the assessment suggests a number of Slough's residential properties (CR-66, CR-72, CR-75, CR-81) will experience minor to major magnitude of impact from evening mainline construction noise and night-time resurfacing and traffic management activity as well as night impact from demolition of bridges at CROB 17 and CROB 18 and this also gives SBC concerns.

Table 3 Slough Noise Sensitive receptors – Construction Noise Levels night-time

Receptor	Threshold Value or existing façade level (Night) (dB LAeq, T)	Bridge Demolition – calculated façade level (dB LAeq, T)	Bridge Removal (dB LAeq, T)	Resurfacing (dB LAeq, T)	Traffic management (dB LAeq, T)
CR-66	63			+4 (67)	+ 1 (64)
CR-72	63			+7 (70)	+3 (66)
CR-75	74			+ 7 (81)	+ 3 (77)
CR-81	67			+ 7 (74)	+ 3 (70)
CROB-11	64	+2 (66)			

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CROB-17	70	+ 4 (74)	+1 (71)		
CROB-18	61	+ 3 (64)			

- 1.30 The CEMP has since been revised dated 5th November and includes noise limits and noise monitoring (but still requires final approval with Local Authorities under a SoGC). It will also need to be submitted and approved and secured by Requirement 8 (Schedule 2) of the DCO.
- 1.31 SBC does not raise concerns with the Section 61 approach, but it does raise concerns about the proposed noise limits and construction activities at night-time. In particular, under the second revision of the CEMP that: night-time: 75 dB LAeq, 1 hour (free field), with restrictions on the types of activities.
- 1.32 SBC opinion is that the following activities shall be restricted at night; piling activities; demolition of bridges affect residents CROB-17 and CROB-18; mainline evening mainline construction noise and night-time resurfacing and traffic management activity at receptors (CR-66, CR-72, CR-75, CR-81).
- 1.33 This level is excessively high in SBC view and would cause significant harm to local residents even during temporary phase of construction works. At this level CR66, CR72 AND CROB-18 would be eligible for re-homing and CR 75, CR81 and CROB-17 would be eligible for noise insulation.
- 1.34 Once the night time noise level have been monitored and validated, SBC suggest setting a noise limit at night where the total noise (ambient + construction noise) is set at **+3dB or 75dB** which is lower above the measured night-time **ambient level in absence of construction activity**.
- 1.35 With respect to enhanced measures and new and replacement noise barriers SBC welcomes additional noise barriers and would recommend higher noise barriers would have both noise and air quality benefits. SBC would advise that noise barriers are erected to protect The Myrke allotments, and Mercian Recreation Ground.
- 1.36 The following environmental noise information is also requested with respect to the smart motorway scheme.
- SBC seeks clarification of all slough residential properties that may be entitled to noise compensation or insulation under the Land Compensation Act 1973 and the Noise Insulation Regulations 1975, as amended 1988. ?
 - It appears that a significant number of properties will experience (what is termed a negligible increase of more than 1dB as a result of this scheme, but how many will also experience the specified level of L_{10(18-hour)} of 68dB(A)?