

M54 to M6 Link Road

TR010054

Volume 6

6.3 Environmental Statement

Appendices

**Appendix 5.4 Construction Air Quality
and Mitigation**

Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009

January 2020

Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009**

**M54 to M6 Link Road
Development Consent Order 202[]**

**6.3 Environmental Statement Appendices
Appendix 5.4 Construction Air Quality and Mitigation**

Regulation Number	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010054
Application Document Reference	6.3
Author	M54 to M6 Link Road Project Team and Highways England

Version	Date	Status of Version
1	January 2020	DCO Application

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1 Introduction

1.1.1 This technical appendix collates construction information on the following elements of the construction phase:

- Construction dust (e.g. bridge works).
- Construction site compounds.
- Stockpiles.
- Non Road Mobile Machinery (NRMM).
- Haul routes.
- Demolition.
- Stationary plant.

1.1.2 The technical appendix also considers the risk of significant adverse air quality effects being associated with these temporary activities. The technical appendix also presents mitigation measures to minimise the risk of significant adverse air quality effects.

2 Construction Activities

- 2.1.1 During the construction of the Scheme, there is the potential for temporary adverse impacts from dust emissions from construction activities at sensitive receptors within the vicinity of the construction site.
- 2.1.2 The types of activities with the potential to generate dust during the Scheme construction phase include:
- movement of vehicles;
 - enabling works (e.g. verge clearance);
 - earthworks;
 - minor demolition of underpass and a pedestrian subway;
 - excavation;
 - construction of retaining walls and bridge works etc.;
 - surfacing works;
 - central reserve works;
 - installation of verge furniture and planting vegetation; and
 - stockpiling/ storage.
- 2.1.3 Receptors such as residential properties, hotels, schools and hospitals are considered to be sensitive to nuisance and/or health dust impacts. In addition, some designated ecological sites (Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), Special Protection Areas (SPA) and RAMSAR sites) are considered to be potentially sensitive to dust. Where these receptors are located within 200 m of potential dust generating activities, appropriate mitigation measures would be required in order to reduce the risk of dust impacts. These mitigation measures are outlined in the Outline Environmental Management Plan (OEMP) [TR010054/APP/6.11] and in Section 10.
- 2.1.4 The following sensitive receptors are located within 200 m of the Scheme boundary:
- residential properties located close to Junction 11 of the M6, the nearest of which are on Wolverhampton Road;
 - Brookfield Farm, east of the A460;
 - residential properties at Hilton, the nearest of which are located on Hilton Lane, Dark Lane and Park Road, to the east and west of the Scheme respectively;
 - residential properties and the Red White and Blue Public House, at Hilton, the nearest of which to the Scheme boundary are to the west of Cannock road;
 - residential properties on and to the west of A460 Cannock Road at Featherstone; and
 - Tower House Farm, north of the M54.
- 2.1.5 There are no nationally or internationally designated ecological sites located within 200 m of the Scheme boundary, although there are locally designated conservation sites and ancient woodland.

- 2.1.6 Precise information on the construction works are not available, these will be confirmed during the detailed design stage. However, the appointed buildability contractor has provided reasonable assumptions regarding the construction works, plant requirements and construction traffic. The assessment has been based on this information.

3 Construction Site Compounds

3.1.1 Two main compound areas will be constructed as part of the construction programme.

3.2 M6 Junction 11

3.2.1 The site will be used for civils and other operations and include offices, storage and welfare, as well as car parking, a materials laydown area and topsoil storage area. There is also the potential for this compound to include a caravan site to accommodate a proportion of the workforce.

3.2.2 Access into the compound will be via two points on Mill Lane, off the A460. One for Heavy Goods Vehicles (HGVs) accessing the laydown area and one for Light Goods Vehicles (LGVs) accessing the offices, storage and welfare areas.

3.2.3 The whole area will be covered in crushed concrete or stone with geotextile placed directly onto the existing topsoil.

3.2.4 Asphalt roadways will be laid to allow an all-weather access to each facility within the compound and these will be extended to the A460 highway.

3.2.5 Main services such as telephone, electricity and water will be sourced from the existing utilities, but a back-up power generation will be required in case of a power outage.

3.2.6 The compound will include a topsoil strip on its western side. This will be grass seeded to reduce the visual impact.

3.2.7 The M6 Junction 11 compound is not located within 200 m of any human or ecological receptors¹.

3.3 M54 Junction 1

3.3.1 The site will be used for civils and other operations and will also include offices, storage and welfare, as well as car parking, a materials laydown area and topsoil storage area.

3.3.2 Access into the compound will be via a new access road, off the A460 and opposite the Hilton Petrol Station.

3.3.3 The whole area will be covered in crushed concrete or stone with geotextile placed directly onto the existing topsoil.

3.3.4 Asphalt roadways will be laid to allow an all-weather access to each facility within the compound and these will be extended to the A460 highway.

3.3.5 Main services such as telephone, electricity and water will be sourced from the existing utilities, but a back-up power generation will be required in case of a power outage.

3.3.6 The compound will include a topsoil strip on its north eastern side. This will be grass seeded to reduce the visual impact.

¹ nationally or internationally designated ecological sites

3.3.7 The M54 Junction 1 compound access road is within 30 m of the nearest human receptor (residential properties to the west of the A460). The compound itself is approximately 80 m away from the nearest human receptor (residential properties to the west of the A460). There are no ecological receptors with 200 m, of the compound or access road.

3.4 Satellite compounds

3.4.1 In addition to the two main compound areas, additional locations have been identified for small scale satellite office and welfare facilities. These would be located close to work areas within the Scheme boundary, sited on the roundabout at the M54 Junction 1 and along the mainline of the Scheme to service the construction of Hilton Lane bridge and the accommodation bridge east of Brookfield Farm. Satellite compounds would be lit with temporary lighting, with security measures in place. Plant and equipment would be stored at the satellite compound during the works. There are likely to be receptors within 200 m of these compounds.

4 Borrow Pit and Stockpiles

4.1.1 There is a single borrow pit proposed, with a capacity of up to 546,500 m³. This would be located to the west of the Scheme alignment, to the north of Park Road. The borrow pit would be within 200 m of the following human receptors:

- residential properties on Hilton Lane, on its approach to the A460, 80 m to the north;
- residential properties on the A460, north of Dark Lane, 85 m to the south-west; and
- residential properties on Park Road, 80 m to the south.

4.1.2 There are 8 temporary topsoil / earthworks storage areas proposed, of varying volume. This includes stockpiles with 200 m of the following locations:

- residential properties on Wolverhampton Road, north-east of M6 Junction 11;
- Brookfield Farm, to the east of the A460;
- residential properties on Hilton Lane on the approach to the A460, west of the Scheme;
- residential properties on Hilton Lane, east of the Scheme;
- residential properties on Dark Lane;
- residential properties off the A460, south of Dark Lane; and
- Tower House Farm, north-east of M54 Junction 1.

5 Non-Road Mobile Machinery

5.1.1 Non-Road Mobile Machinery (NRMM) will be required during the construction phases; examples of which are provided below:

- bulldozers;
- excavators;
- delivery lorries for aggregate, cement, hardcore etc;
- road sweepers; and
- lime spreaders.

5.1.2 NRMM will operate along the proposed routes and within the construction compound sites. The plant detailed in Table 1 has the potential to impact sensitive receptors within 200 m of the M54 Junction 1 compound and the Scheme alignment.

Table 1: NRMM plant list

Location	Plant list	Average daily number of each plant operational at any one time
Construction of site compounds	Tracked excavator 107 22 t	1
	Dozer 82 11 t	1
	Road lorry (full) 270 39 t	2
	Circular bench saw (petrol-cutting concrete blocks)	1
	Articulated dump truck (tipping fill) 187 23 t	1
	Vibratory roller 20 3 t	1
	Roller (rolling fill) 145 18 t	1
	Grader 205 25 t	1
	Wheeled excavator 63 14 t	1
	Asphalt paver (+ tipper lorry) 78 18 t	1
	Lorry 4-axle wagon	1
	Lorry with lifting boom 50 6 t	1
	250cfm Compressor	1
	Dumper 32 3 t	1
	Wheeled backhoe loader 62 8 t	1
	Telescopic handler 76 4 t	1
	Poker vibrator	2
	Mobile telescopic crane 260 55 t	1

5.1.3 NRMM operating along the Scheme will be transient and will have intermittent emissions that will only impact on the same receptor for the duration of time it is operational for at any specific location.

5.1.4 Appropriate mitigation measures will be required at compounds and haul roads to ensure potential effects are managed appropriately. These measures are outlined in the OEMP [TR010054/APP/6.11] and in Section 10 of this appendix.

6 Haul Roads

- 6.1.1 The onsite haul road (used by NRMM and HGVs) follows the alignment of the Scheme. In the north it joins the A460, near to the junction with the M6 Junction 11, and to the south it meets the A460 near, north of the junction with M54 Junction 1.
- 6.1.2 Receptors located within 200 m of the haul road are summarised as follows:
- Brookfield Farm, approximately 100 m to the west;
 - residential properties off Hilton Lane, approximately 150 m to the east;
 - residential properties off Dark Lane, approximately 50 m to the west; and
 - residential properties off the A460, approximately 30 m to the west at the southern extent of the haul road.
- 6.1.3 Whilst the number of construction phase HGV movements using the onsite haul road could potentially be in excess of 200 two-way movements per day, it is not expected that emissions from these movements would have a significant effect at any receptor. The assessment has quantified the impact of peak construction phase vehicle movements on the A460 at locations immediately adjacent to that road, the closest of which is within 10 m. Worst-case NO₂ impacts reported peak at +0.5 µg/m³ where total NO₂ concentrations are 36.7 µg/m³ (R374), and the effect is therefore not significant. The closest receptors to the onsite haul road are located on Dark Lane, approximately 50 m west of the haul road. Assuming the same level of construction traffic would use the onsite haul road as has been modelled on the A460, the NO₂ impact would be less than 0.5 µg/m³ at those receptors on Dark Lane. Total NO₂ concentrations would also be well below the air quality objective for that pollutant, with DM concentrations of around 17 µg/m³.

7 Demolition

- 7.1.1 Demolition is limited to the removal of existing highways infrastructure at M6 Junction 11.
- 7.1.2 Sensitive receptors located within 200 m of these works include residential properties on Wolverhampton Road, approximately 60 m to the east of M6 Junction 11.

8 Earthworks and Construction

- 8.1.1 Earthworks and Construction works will be undertaken throughout the Scheme boundary.
- 8.1.2 The main earthworks and construction works include the grading of the Scheme, the new junction layouts at M6 Junction 11 and M54 Junction 1, and the Hilton Lane overbridge.
- 8.1.3 Standard mitigation measures will be required along the entirety of the route, as listed in Section 10.

9 Stationary Plant

- 9.1.1 A plant list has been provided by the Scheme Delivery Partner, which includes both stationary plant and NRMM.
- 9.1.2 Of the stationary plant listed only small generators are considered to have the potential to result in air quality impacts.
- 9.1.3 Site compounds would be powered via connection to the existing low/high voltage mains power supply. A limited number of standalone diesel-fired generators would be required to facilitate on site welding, but these would be of a load to accommodate the limited energy demand of such activity and would only be operational as and when welding activity is required.

10 Mitigation Techniques

10.1.1 The construction and operation activities outlined in this appendix would be mitigated using standard mitigation measures along the entire scheme route, at all construction compounds and for all works. These standard mitigation measures are presented in Table 2.

Table 2: Standard construction mitigation measures

Mitigation	Mitigation measures
Mitigation for all site: dust management	Develop and implement a series of dust management measures and monitoring measures. The level of detail would include as a minimum the measures set out in this table. Monitoring may include monitoring of dust deposition, dust flux, real-time PM ₁₀ continuous monitoring and/ or visual inspections.
	Monitoring
	Undertake periodic on-site inspections, where receptors are nearby, to monitor dust, record inspection results, and make the log available to the local authority etc. when asked.
	Preparing and maintaining the site
	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
	Keep site fencing, barriers and scaffolding clean using wet methods where there is the risk of dust accumulation.
	Remove materials that have the potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
	Cover, seed or fence stockpiles to prevent wind whipping.
	Operating vehicle/ machinery and sustainable travel
	Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided).
	Ensure all vehicles (HGVs and mobile plant) switch off engines when stationary or not in use - no idling vehicles.
	All construction plant would use fuel equivalent to ultra-low sulphur diesel where possible.
	Operations
Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as	

Mitigation	Mitigation measures
	reasonably practicable after the event using wet cleaning methods.
Measures specific to demolition	See Table 3
Measures specific to surfacing works	Surfacing equipment (e.g. planer) only to be operated with any manufacturers dust abatement measures in place.
Measures specific to construction	Avoid scabbling (roughening of concrete surfaces) if possible.
	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Measures specific to trackout	Use water-assisted dust sweeper(s) on access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
	Record all inspections of haul routes and any subsequent action in a site log book.

10.1.2 Where standard mitigation measures may not be sufficient to minimise emissions of dust and plant emissions alone, further standard mitigation measures are proposed and these further standard measures are presented in Table 3.

Table 3: Further standard construction mitigation measures

Mitigation	Mitigation measures
Mitigation for all sites: communication	During the construction phase appropriate mechanisms to communicate with local residents would be set up to highlight potential periods of disruption (e.g. web-based, newsletters, newspapers, radio announcements etc.) An information web-page would be provided and kept up-to-date on the Highways England website to reflect construction and community liaison requirements. It is envisaged that the web-page would provide up-to-date information on the progress of the construction works, areas affected by construction, mitigation in place to reduce adverse effects, information regarding planned construction works (including any proposed works outside normal hours) and works recently completed. Residents would be provided with a point of contact for any queries or complaints.
	Display the name and contact details of person(s) accountable for air quality and dust issues on the construction site boundaries. This may be the environment manager/ engineer or the site manager.

Mitigation	Mitigation measures
	Display the head or regional office contact information.
Mitigation for all site: dust management	Site management
	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
	Make the complaints log available to the local authority etc. as soon as reasonably practicable.
	Record any exceptional incidents that cause dust and/or air emissions, either onsite or offsite, and the action taken to resolve the situation in the log book.
	If applicable, hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. In particular, it is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.
	Monitoring
	Carry out regular site inspections to monitor the effectiveness of mitigation measures, record inspection results, and make an inspection log available to the local authority etc. promptly upon request.
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
	Undertake dust deposition, dust flux, or real-time PM ₁₀ continuous monitoring for higher risk activities. Wherever possible commence baseline monitoring at least three months before work commences on site or, if it is a large site, before work on a phase commences on an area of the scheme.
	Preparing and maintaining the site
	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Erect solid screens or barriers around particularly dusty activities or the site boundary that are at least as high as any stockpiles on site for higher risk areas.
	Avoid site runoff of water or mud.
Operating vehicles, machinery and sustainable travel	
Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.	

Mitigation	Mitigation measures
	<p>Where stationary generators are required ensure these are sited as far from sensitive receptors as possible.</p> <p>Operate stationary generators within manufacturer guidelines, under optimum load for periods of operation and regularly service equipment to maintain efficient operation.</p> <p>Manage the sustainable delivery of goods and materials through careful programming of delivery.</p> <p>Implement a travel plan that supports and encourages sustainable travel (e.g. public transport, cycling, walking, and car-sharing).</p> <p>Operations</p> <p>Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction (e.g. suitable local exhaust ventilation systems).</p> <p>Ensure an adequate water supply on the site for effective dust/ particulate matter suppression/ mitigation, using non-potable water where possible and appropriate.</p> <p>Use enclosed chutes and conveyors and covered skips.</p> <p>Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.</p> <p>Waste management</p> <p>Avoid bonfires and burning of waste materials.</p>
Measures specific to demolition	<p>Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.</p> <p>Avoid explosive blasting where possible, using appropriate manual or mechanical alternatives.</p> <p>Comply with measures set out in any Asbestos Management Plan if one is required.</p>
Measures specific to earthworks	<p>Re-vegetate earthworks and exposed areas/ soil stockpiles to stabilise surfaces as soon as practicable.</p> <p>Use hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.</p> <p>Where possible, only remove the cover in small areas during work and not all at once.</p>

Mitigation	Mitigation measures
Measures specific to construction	Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overflowing during delivery.
	For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
	For cement batching plants enclose as much of the plant as possible to minimise emissions of dust during preparation and identify measures to minimise emissions at loading points (e.g. pre-mixing).
Measures specific to trackout	Maintain and inspect on-site haul routes for integrity and operate a programme of routing maintenance and where necessary carry out repairs to the surface as soon as reasonably practicable.
	Install hard surfaced haul routes if possible, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and are regularly cleaned.
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
	In locations without hard standing it may be necessary to clean the vehicle bodies in addition to wheels.
	Access gates to be located at least 10m from receptors where possible.

11 Conclusions

- 11.1.1 There is potential for temporary adverse impacts from dust emissions to occur at sensitive receptors located close to the Scheme during the construction works.
- 11.1.2 The following sensitive receptors are located within 200 m of the Scheme boundary:
- residential properties located close to Junction 11 of the M6, the nearest of which are on Wolverhampton Road;
 - Brookfield Farm, east of the A460;
 - residential properties at Hilton, the nearest of which are located on Hilton Lane, Dark Lane and Park Road, to the east and west of the Scheme respectively;
 - residential properties and the Red White and Blue Public House, at Hilton, the nearest of which to the Scheme boundary are to the west of Cannock road;
 - residential properties on and to the west of A460 Cannock Road at Featherstone; and
 - Tower House Farm, north of the M54.
- 11.1.3 The locations listed above could be affected by construction dust emissions. However, the specific activities that are most likely to generate dust and have receptors within 200 m of are as follows:
- Stockpiling at the temporary storage / earthworks storage areas, affecting properties adjacent to the Wolverhampton Road, off M6 Junction 11, the A460 at Hilton and Featherstone, and Hilton Lane, Dark Lane and Park road, at Hilton.
 - Haul Routes potentially affecting receptors adjacent to the A460 on the approach to and from the construction compounds.
 - Earthworks and construction work close to Dark Lane and Hilton Lane, at Hilton.
- 11.1.4 Site specific mitigation measures may be necessary to avoid significant temporary effects on air quality for these activities and locations, in addition to standard mitigation measures. These measures are outlined in the OEMP [TR010054/APP/6.11] and Section 10 of this appendix. Adoption of such measures would minimise the risk of significant adverse dust effects.
- 11.1.5 Other emissions associated with the construction phase such as mobile or stationary plant are also not expected to cause a significant air quality effect at receptors. This is because these emissions will be controlled through mitigation measures provided in Section 10 and as included in the OEMP [TR010054/APP/6.11].