The Drax Power (Generating Stations) Order

Land at, and in the vicinity of, Drax Power Station, near Selby, North Yorkshire

Environmental Statement
Appendix 6.2 - Construction Dust Assessment

The Planning Act 2008
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulation 5(2)(a)

Drax Power Limited

Drax Repower Project

Applicant:	DRAX POWER LIMITED
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Appendix 6.2: Construction Dust Assessment

6.2 METHODOLOGY

6.2.1. Dust comprises particles typically in the size range 1-75 micrometres (µm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials. The larger dust particles fall out of the atmosphere quickly after initial release and therefore tend to be deposited in proximity to the source of emission. Dust therefore, is unlikely to cause long-term or widespread changes to local air quality; however, its deposition on property and cars can cause 'soiling' and discolouration. This may result in complaints of nuisance through amenity loss or perceived damage caused, which is usually temporary.

6.2.2. The smaller particles of dust (less than 10 µm in aerodynamic diameter) are known as particulate matter (PM10) and represent only a small proportion of total dust released; this includes a finer fraction, known as PM2.5 (with an aerodynamic diameter less than 2.5µm). As these particles are at the smaller end of the size range of dust particles they remain suspended in the atmosphere for a longer period of time than the larger dust particles, and can therefore be transported by wind over a wider area. PM10 and PM2.5 are small enough to be drawn into the lungs during breathing, which in sensitive members of the public could have a potential impact on health.

6.2.3. An assessment of the likely significant effects on local air quality due to the generation and dispersion of dust and PM10 during the construction phase has been undertaken using: the relevant assessment methodology published by the IAQM; the available information for this phase of the Proposed Scheme provided by the Applicant and Project Team; and, professional judgement.

6.2.4. The IAQM methodology assesses the risk of potential dust and PM10 effects from the following four sources: demolition; earthworks; general construction activities and track-out. It takes into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase in dust and PM10 levels to assign a level of risk. Risks are described in terms of there being a low, medium or high risk of dust effects. Once the level of risk has been ascertained, then site specific mitigation proportionate to the level of risk is identified, and the significance of residual effects determined. A summary of the IAQM assessment methodology is detailed below.

Stage 1 – Screening the Need for a Detailed Assessment

6.2.5. An assessment will normally be required where there are:

- 'human receptors' within 350 m of the Site boundary; or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500m from the Site entrance(s); and / or
- 'ecological receptors' within 50 m of the Site boundary; or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the Site entrance(s).

6.2.6. Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is "negligible".

Stage 2 – Define the Potential Dust Emission Magnitude

6.2.7. The following are examples of how the potential dust emission magnitude for different activities can be defined. (Note that not all the criteria need to be met for a particular class). Other criteria may be used if justified in the assessment.

Table A.2-1 Examples of construction works and potential dust emission magnitude

Dust Emission Magnitude	Activity
Large	**Demolition** >50,000 m^3 building demolished, dusty material (e.g. concrete), on-site crushing / screening, demolition >20 m above ground level
	Earthworks >10,000 m^2 site area, dusty soil type (e.g. clay), >10 earth moving vehicles active simultaneously, >8 m high bunds formed, >100,000 tonnes material moved
	Construction >100,000 m^3 building volume, on site concrete batching, sandblasting
	Trackout >50 HDVs out / day, dusty surface material (e.g. clay), >100 m unpaved roads
Medium	**Demolition** 20,000 - 50,000 m^3 building demolished, dusty material (e.g. concrete) 10-20 m above ground level
	Earthworks 2,500 - 10,000 m^2 site area, moderately dusty soil (e.g. silt), 5-10 earth moving vehicles active simultaneously, 4 m – 8 m high bunds, 20,000 - 100,000 tonnes material moved
	Construction 25,000 - 100,000 m^3 building volume, dusty material e.g. concrete, on site concrete batching
	Trackout 10 - 50 HDVs out / day, moderately dusty surface material (e.g. clay), 50 - 100 m unpaved roads
Small	**Demolition** <20,000 m^3 building demolished, non-dusty material (e.g metal cladding), <10m above ground level, work during wetter months
	Earthworks <2,500 m^2 site area, soil with large grain size (e.g. sand), <5 earth moving vehicles active simultaneously, <4m high bunds, <20,000 tonnes material moved, earthworks during wetter months
	Construction

	<25,000 m^3, non-dusty material (e.g. metal cladding or timber)
	Trackout <10 HDVs out / day, non-dusty soil, < 50 m unpaved roads

Stage 2B – Define the Sensitivity of the Area

6.2.8. The tables below present the IAQM assessment methodology to determine the sensitivity of the area to dust soiling, human health and ecological effects respectively. The IAQM guidance provides guidance to allow the sensitivity of individual receptors to dust soiling and health effects to assist in the assessment of the overall sensitivity of the study area.

Table A.2-2 Sensitivity of the area to dust soiling effects

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table A.2-3 Sensitivity of the area to human health effects

Receptor Sensitivity	Annual Mean PM_{10} Concentration ($\mu g/m^3$)	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	**>32**	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low

Receptor Sensitivity	Annual Mean PM_{10} Concentration ($\mu g/m^3$)	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
Medium	**>32**	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	**-**	>1	Low	Low	Low	Low	Low

Table A.2-4 Sensitivity of the area to ecological effects

Receptor Sensitivity	Distance from the Sources (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Stage 2C – Define the Risks of Impacts

6.2.10. The dust emissions magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to determine the risk of effects without mitigation applied. For those cases where the risk category is 'negligible' no mitigation measures beyond those required by legislation will be required.

Table A.2-5 Risk of dust effects

Sensitivity of surrounding area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks and Construction			
High	High Risk	Medium Risk	Low Risk

Sensitivity of surrounding area	Dust Emission Magnitude		
	Large	Medium	Small
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Stage 3 – Site Specific Mitigation

6.2.11. Having determined the risk categories for each of the four activities it is possible to determine the site-specific measures to be adopted. These measures will be related to whether the Site is considered to be a low, medium or high risk site. The IAQM guidance details the mitigation measures required for high, medium and low risk sites as determined in Step 2C.

Stage 4 – Determine Significant Effects

6.2.12. Once the risk of dust effects have been determined in Step 2C and the appropriate dust mitigation measures identified in Step 3, the final step is to determine whether there are likely significant effects arising from the construction phase. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.

Significance Criteria

6.2.13. The IAQM assessment methodology recommends that significance criteria is only assigned to the identified risk of dust effects occurring from a construction activity with appropriate mitigation measures in place. For almost all construction activities, the application of effective mitigation, should prevent any likely significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.

Assessment of Effects

6.2.14. Construction activities that have the potential to generate and / or re-suspend dust and PM_{10} include:

- Site clearance and preparation including demolition activities.
- Preparation of temporary access / egress to the Site and haulage routes.
- Earthworks.
- Materials handling, storage, stockpiling, spillage and disposal.
- Movement of vehicles and construction traffic within the Site (including excavators and dumper trucks).

- Use of crushing and screening equipment / plant.
- Exhaust emissions from site plant.
- Construction of buildings, roads and areas of hardstanding alongside fabrication processes.
- Internal and external finishing and refurbishment.
- Site landscaping after completion.

6.2.15. The majority of the releases are likely to occur during the 'working week'. However, for some potential release sources (e.g. exposed soil produced from significant earthwork activities) in the absence of dust control mitigation measures, dust generation has the potential to occur 24 hours per day over the period during which such activities are to take place.

Assessment of Potential Dust Emission Magnitude

6.2.16. The IAQM assessment methodology has been used to determine the potential dust emission magnitude for the following four different dust and PM_{10} sources: demolition; earthworks; construction; and, trackout. The findings of the assessment are presented below.

Demolition

6.2.17. During Stage 0 Site Reconfiguration Works demolition activities will occur. It is estimated that the volume of buildings to be demolished is between 20,000 m^3 and 50,000 m^3, with potentially dusty construction material, and with demolition activities occurring more than 20 m above ground level. They include the Site Reconfiguration Works Therefore, the potential dust emission magnitude is considered to be large for demolition activities.

6.2.18. The Pipeline Area is not associated with demolition activities and therefore no dust emission magnitude for demolition has been ascribed.

Earthworks

6.2.19. The total area of the Power Station Site is more than 10,000 m^2, the soil types on site includes clay and therefore potentially dusty, and the total material that will be moved is estimated to be 5,000 tonnes per annum. It is also estimated that more than 10 heavy earth moving vehicles will be active at any one time, and that the formation of bunds is likely to be higher than 8 m. Therefore, the potential dust emission magnitude is considered to be large for earthwork activities for the Power Station Site.

6.2.20. Earthworks activities associated with the Pipeline Area will be transient in nature and it has been assumed that the earthwork area at any one time will fall within the IAQM range for medium sites (2,500 to 10,000 m^2). The soil type is assumed to be moderately dusty and the total material of material that will be moved has been assumed to be between 20,000 and 100,000 tonnes. It is anticipated that between 5 and 10 heavy earth moving vehicles will be active at any one time, and that the height of bunds will not exceed 4 m. Therefore, the potential dust emission magnitude is considered to be medium for earthwork activities for the Pipeline Area.

Construction

6.2.21. The total volume of buildings to be constructed on the Power Station Site has been assumed to be more than 100,000 m^3 with site concrete batching and sand blasting activities being undertaken. Therefore, the potential dust emission magnitude is considered to be large for construction activities.

6.2.22. The Pipeline Area is not associated with significant construction activities and therefore the dust emission magnitude for construction is anticipated to be small.

Trackout

6.2.23. Based on the anticipated construction traffic (refer to Chapter 5 (Transport) for further details), on average there will be 29 HDV (>3.5t) two way movements, with a maximum of 64 HDV in the 7th quarter of the construction period, in any one day travelling on moderately dusty surface materials. Due to the size of the site, it is assumed that the length of unpaved roads within Power Station Site will be more than 100 m. Therefore, the potential dust emission magnitude is considered to be large for trackout for the Power Station Site.

6.2.24. Construction of the pipeline is anticipated to be undertaken during the 8th and 9th quarter of the construction period with a maximum of 15 HDV two way movements in any one day. Considering the expected HDV movements and the length of the proposed pipeline (3 km), the potential dust emission magnitude is considered to be large for trackout for the Pipeline Site.

6.2.25. Table A6.2-6 provides a summary of the potential dust emission magnitude determined for each construction activity considered for the Pipeline Area and the Power Station Site.

Table A.2-6 Potential Dust Emission Magnitude

Pipeline Area	Dust Emission Magnitude	Power Station Site	Dust Emission Magnitude
Demolition	Large	**Demolition**	n/a
Earthworks	Large	**Earthworks**	Medium
Construction Activities	Large	**Construction Activities**	Small
Trackout	Large	**Trackout**	Large

Assessment of Sensitivity of the Study Area

6.2.26. Windroses from the meteorological data used for the dispersion modelling of operational phase impacts are provided in Appendix 6.3. They show that the prevailing wind direction is from the southwest. Therefore, receptors located to northeast of the Power Station Site and the Pipeline Area are more likely to be affected by dust and particulate matter emitted and re-suspended during the construction phase.

6.2.27. Under low wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the source. The closest sensitive receptors to the Power

Station Site are the Drax Sports & Social Club (to the south), residential receptors along Main Road (to the south and west) and New Road (to the northeast), all located more than 100 m from the construction and Laydown Areas. There are a limited number of residential receptors within 20 m of the Pipeline Area along Main Road (to the north), Carr Lane (to the north) and Rusholme Lane (south and east). It is anticipated that the majority of construction vehicles will access the Power Station Site and Laydown Areas via the road network (A643 and A641) from Junction 36 of the M62.

6.2.28. Taking the above into account and following the IAQM assessment methodology, the sensitivity of the area to changes in dust and PM_{10} has been derived for each of the construction activities considered. The results are shown in Table A6.2-7.

Table A.2-7 Sensitivity of the Study Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Power Station Site				
Dust Soiling	Low	Low	Low	Low
Human Health	Low	Low	Low	Low
Ecological	n/a	n/a	n/a	n/a
Pipeline Area				
Dust Soiling	n/a	Medium	Medium	Medium
Human Health	n/a	Low	Low	Low
Ecological	n/a	n/a	n/a	n/a

Risks of Impacts

6.2.29. The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation. Table A6.2-8 below provides a summary of the risk of dust impacts for the Pipeline Area and the Power Station Site. The risk category identified for each construction activity has been used to determine the level of mitigation required.

Table A.2-8 Summary Dust Risk Table to Define Site Specific Mitigation

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Power Station Site				
Dust Soiling	Low	Low	Low	Low
Human Health	Low	Low	Low	Low
Ecological	n/a	n/a	n/a	n/a
Pipeline Area				
Dust Soiling	n/a	Low	Low	Medium
Human Health	n/a	Low	Low	Low
Ecological	n/a	n/a	n/a	n/a

6.2.30. The table above indicates that there is the potential for temporary, direct slight effects during the construction phase, prior to the implementation of mitigation measures. Slight negative effects are most likely to occur when earthworks and construction activities are being undertaken on the eastern and southern side of the Site, due to the proximity of residential properties.

MITIGATION

6.2.31. Based on the assessment results, mitigation will be required. Recommended mitigation measures are given below. These measures have been considered as part of the CEMP preparation.

General Communication

6.2.32. A stakeholder communications plan that includes community engagement before work commences on site should be developed and implemented.

- The name and contact details of person(s) accountable for air quality and dust issues should be displayed on the site boundary. This may be the environment manager/engineer or the site manager. The head or regional office contact information should also be displayed

Site Management

6.2.33. All dust and air quality complaints should be recorded and causes identified. Appropriate remedial action should be taken in a timely manner with a record kept of actions taken including of any additional measures put in-place to avoid reoccurrence.

6.2.34. The complaints log should be made available to the local authority on request.

6.2.35. Any exceptional incidents that cause dust and/or air emissions, either on- or offsite should be recorded, and then the action taken to resolve the situation recorded in the log book.

Monitoring

- Daily on-site and off-site inspections should be undertaken, where receptors (including roads) are nearby to monitor dust. The inspection results should be recorded and made available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.
- The frequency of site inspections should be increased when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations should be agreed with the Local Authority. Where possible baseline monitoring should start at least three months before work commences on site or, if it a large site, before work on a phase commences.

Preparing and maintaining the site

- Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.
- Where practicable, erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Where practicable, fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a 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 appropriately.
- Where practicable, cover, seed or fence stockpiles to prevent wind whipping.

Operating vehicle/machinery and sustainable travel

- Ensure all vehicle operators switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- A Construction Logistics Plan should be produced to manage the sustainable delivery of goods and materials.
- A Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing) will be considered in line the DCO requirement for a Construction Workers Travel Plan.

Operations

- 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.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste management

- Avoid bonfires and burning of waste materials.

Measures Specific to Demolition

- 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.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Stockpile surface areas should be minimised (subject to health and safety and visual constraints regarding slope gradients and visual intrusion) to reduce area of surfaces exposed to wind pick-up.
- Where practicable, windbreak netting/screening should be positioned around material stockpiles and vehicle loading/unloading areas, as well as exposed excavation and material handling operations, to provide a physical barrier between the Application Site and the surroundings.
- Where practicable, stockpiles of soils and materials should be located as far as possible from sensitive properties, taking account of the prevailing wind direction.

- During dry or windy weather, material stockpiles and exposed surfaces should be dampened down using a water spray to minimise the potential for wind pick-up.

Measures Specific to Construction

- 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.
- 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 overfilling during delivery.
- All construction plant and equipment should be maintained in good working order and not left running when not in use.

Measures Specific to Trackout.

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being in frequent use.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Access gates to be located at least 10 m from receptors where possible.

6.2.36. Detailed mitigation measures to control construction traffic will be discussed with SDC to establish the most suitable access and haul routes for the site traffic. The most effective mitigation will be achieved by ensuring that construction traffic does not pass along sensitive roads (residential roads, congested roads, via unsuitable junctions, etc.) where possible, and that vehicles are kept clean (through the use of wheel washers, etc.) and sheeted when on public highways. Timing of large-scale vehicle movements to avoid peak hours on the local road network will also be beneficial.

RESIDUAL EFFECTS

6.2.37. The residual effects of dust and PM_{10} generated by construction activities following the application of the mitigation measures described above and good site practice will be negligible.