ENVIRONMENTAL STATEMENT - VOLUME 3 - APPENDIX 6.2

Construction & Decommissioning Dust Assessment

Drax Bioenergy with Carbon Capture and Storage

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

Document Reference Number: 6.3.6.2

Applicant: Drax Power Limited

PINS Reference: EN010120

REVISION: 01

DATE: May 2022

DOCUMENT OWNER: WSP UK Limited

AUTHOR: D. Pawson

APPROVER: B. Tuckett-Jones

PUBLIC

TABLE OF CONTENTS

TABLES

1. CONSTRUCTION & DECOMMISSIONING DUST ASSESSMENT

1.1. METHODOLOGY

STAGE 1 – SCREENING THE NEED FOR DETAILED ASSESSMENT

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

a. 'Human Receptors' within 350 m of the Order Limits (hereafter referred to as 'Order Limits'); or within 50 m of the route(s) used by construction vehicles on the public highway[1], up to 500 m from the Site entrance(s); and / or

b. 'Ecological Receptors' within 50 m of the Order Limits; 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).

1.1.2. 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

1.1.3. 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 1.1 - 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

[1] Based on routes set out in the Outline Construction Traffic Management Plan (Appendix 5.1 of Volume 3 (document reference 6.3.5.1))

Dust Emission Magnitude	Activity
	>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 type (e.g., silt), 5-10 earth moving vehicles active simultaneously, 4-8 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), <10 m 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, <4 m high bunds, <20,000 tonnes material moved, earthworks during wetter months
	Construction <25,000 m^3 building volume, non-dusty material (e.g., metal cladding or timber)
	Trackout

Dust Emission Magnitude	Activity
	<10 HDVs out / day, non-dusty soil, <50 m unpaved roads

STAGE 2B – DEFINE THE SENSITIVITY OF THE AREA

1.1.4. 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 is used to identify 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 1.2 - Sensitivity of the Area to Dust Soiling Effects

Receptor Sensitivity	No. 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 1.3 - Sensitivity of the Area to Human Health Effects

Receptor Sensitivity	Annual mean PM_{10} concentration ($\mu g/m^3$)	No. 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

Receptor Sensitivity	Annual mean PM_{10} concentration ($\mu g/m^3$)	No. of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
		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
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 1.4 - Sensitivity of the Area to Ecological Effects

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

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

STAGE 2C – DEFINE THE RISKS OF IMPACTS

1.1.5. 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 1.5 - 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
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

1.1.6. 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

1.1.7. Once the risk of dust effects has 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

1.1.8. The IAQM assessment methodology recommends that significance criteria are 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.

1.2. ASSESSMENT OF EFFECTS

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

- **a.** Site clearance and preparation;
- **b.** Preparation of temporary access / egress to the Site and haulage routes;
- **c.** Earthworks;
- **d.** Materials handling, storage, stockpiling, spillage and disposal;
- **e.** Movement of vehicles and construction traffic within the Site;
- **f.** Construction of buildings, roads and areas of hardstanding alongside fabrication processes;
- **g.** Internal and external finishing refurbishment; and
- **h.** Site landscaping.

1.2.2. 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

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

Demolition

1.2.4. Whilst there are no demolition works proposed as part of the Proposed Scheme construction, it is likely that during the decommissioning phase, some structures would undergo demolition. For the purposes of this assessment, a conservative approach has been adopted that assumes some demolition activities will occur over 20 m above ground level and that the total volume of buildings demolished would be in excess of 50,000 m^3, including the disturbance of dusty materials (e.g., concrete).

Earthworks

1.2.5. The site area encompasses more than 10,000 m^2 and the soil type is potentially dusty (clay). It is assumed that there will be more than 10 earth-moving vehicles active on site during peak earthwork activities and it is assumed that more than 100,000 tonnes of material will be moved in total. Therefore, the potential dust emission magnitude is considered to be **large** for earthwork activities.

Construction

1.2.6. It is assumed that the total volume of all buildings to be construction will exceed 100,000 m^3, with the need for on-site concrete batching considered to be likely. Therefore, the potential dust emission magnitude is considered to be large for construction activities.

Trackout

1.2.7. It is assumed that there will be in excess of 50 heavy duty vehicle (HDV) movements per day during peak construction periods, along with more than 100 m of unpaved roads used within the Site. Therefore, the potential dust emission magnitude is considered to be large for trackout activities.

1.2.8. **Table 1.6** provides a summary of the potential dust emission magnitude determined for each construction activity considered for the Proposed Scheme.

Table 1.6 - Potential Dust Emission Magnitude

Proposed Scheme Site	Dust Emission Magnitude
Demolition	Large
Earthworks	Large
Construction	Large

Proposed Scheme Site	Dust Emission Magnitude
Trackout	Large

ASSESSMENT OF SENSITIVITY OF THE STUDY AREA

1.2.9. Windroses from the meteorological data used for the dispersion modelling of operational phase impacts are provided in **Appendix 6.3 (Atmospheric Dispersion Modelling)**.(document reference 6.3.6.1). They show that the prevailing wind direction is from the southwest. Therefore, receptors located to northeast of the Power Station Site are more likely to be affected by dust and particulate matter emitted and re-suspended during the construction phase. Under low wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the source.

1.2.10. Based on the latest plans for the proposed construction laydown areas (see **Figure 6.1 (Construction Phase Assessment Study Area)** (document reference 6.2.6.1), there is functionally-linked land within 50 m outside of the Order Limits (specifically to the north of the Drax Power Station wood yard), which is associated with a number of ecological receptors[2] (i.e., land outside a designated European Site, but used by European Site qualifying interests). As such, the receptor sensitivity of this land is classified as 'high' as per the IAQM criteria for ecological receptors.

1.2.11. With respect to dust soiling and human health, there are proposed habitat provision areas located inside the Order Limits, which are within 20 m of Drax Abbey Farm and within 50 m of Foreman's Cottage, although the potential for dust generation from activities within these areas is anticipated to be negligible. However, by conservatively assuming that any construction activity, aside from demolition[3], could occur anywhere within the Order Limits (see **Figure 6.1 (Atmospheric Dispersion Modelling)**), additional identified sensitive receptors within 100 m of the Limits would include Drax Sports and Social Club and the East Yorkshire Caravan Salvage, with the Old Lodge and residential receptors adjacent to Adamson Court and Hales Lane within 350 m.

1.2.12. Taking account of the above and given the low background annual mean PM_{10} concentrations within the construction phase Study Area, the IAQM guideline criteria have been used to determine that the sensitivity of the area to changes in dust and PM_{10}. The results are presented in **Table 1.7**.

[2] Specifically, this land could be used by bird species and / or otter that are qualifying features of Derwent Valley SAC, Lower Derwent Valley SAC, Lower Derwent Valley SPA, Lower Derwent Valley Ramsar, Humber Estuary SPA, and Humber Estuary Ramsar.
[3] Any demolition activities would be focussed within the centre of the Site and during decommissioning only.

Table 1.7 - Sensitivity of the Construction Phase Study Area

Potential Impact	Sensitivity of the Study Area			
	Demolition	**Earthworks**	**Construction**	**Trackout**
Dust soiling	Low	Medium	Medium	Medium
Human health	Low	Low	Low	Low
Ecological	Low	Medium	Medium	Medium

RISK OF IMPACTS

1.2.13. 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 1.8 provides a summary of the risk of dust impacts for the Proposed Scheme. The risk category identified for each construction activity has been used to determine the level of mitigation required.

Table 1.8 - Summary Dust Risk Table to Define Site Specific Mitigation

Potential Impact	Risk			
	Demolition	**Earthworks**	**Construction**	**Trackout**
Dust soiling	Medium Risk	Medium Risk	Medium Risk	Medium Risk
Human health	Medium Risk	Low Risk	Low Risk	Low Risk
Ecological	Medium Risk	Medium Risk	Medium Risk	Medium Risk

1.2.14. The table above indicates that there is a *low to medium risk* of dust impacts in the absence of mitigation. As such, there is the potential for temporary, direct moderate adverse effects during the construction phase, prior to the implementation of mitigation measures. These effects are most likely to occur when earthworks and construction activities are being undertaken in the eastern, northern, and southern areas of the Site, due to the proximity of residential properties and functionally-linked[2] land to designated ecological receptors.

1.3. MITIGATION

1.3.1. The assessed dust risk rating has been used to determine the appropriate prevention and mitigation measures that should be applied via the implementation of a CEMP,

developed from the **Register of Environmental Actions and Commitments (REAC)** (document reference 6.5) that is submitted in conjunction with the ES. The recommended measures to be applied as relevant to the detailed construction methodology are given below under respective categories.

General Communication

a. A general stakeholder communications plan that includes community engagement before work commences on site should be developed and implemented, to include communications with respect to potential dust-generating activities.

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

Site Management

a. 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.

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

Monitoring

a. When there is a risk of dust from construction activities, 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.

b. 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.

c. Where deemed applicable, 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

a. Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.

b. Where practicable, erect solid screens or barriers around dusty activities and material stockpiles on site. Specifically, hoarding at a height of 2.4 m agl will be specified for the Proposed Scheme.

c. 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.

d. Avoid site runoff of water or mud.

e. Keep site fencing, barriers and scaffolding clean using wet methods.

f. 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.

g. Where practicable, cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicles / Machinery and Sustainable Travel

a. Ensure all vehicle operators switch off engines when stationary - no idling vehicles.

b. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.

c. A Construction Traffic Management Plan will be produced to manage the sustainable delivery of goods and materials (see paragraph 1.3.2 below).

d. A Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing) will be developed in line with the DCO requirement for a Construction Workers Travel Plan (see **paragraph 1.3.2** below).

Operations

a. 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.

b. Ensure an adequate water supply on the site for effective dust / particulate matter suppression / mitigation, using non-potable water where possible and appropriate.

c. Use enclosed chutes and conveyors and covered skips.

d. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.

e. 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

a. Avoid bonfires and burning of waste materials.

Measures specific to Earthworks

a. Re-vegetate earthworks and exposed areas / soil stockpiles to stabilise surfaces as soon as practicable.

b. Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.

c. 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.

d. 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.

e. Where practicable, stockpiles of soils and materials should be located as far as possible from sensitive properties, taking account of the prevailing wind direction.

f. 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

a. 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.

b. 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.

c. All construction plant and equipment should be maintained in good working order and not left running when not in use.

Measures Specific to Trackout

a. 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.

b. Avoid dry sweeping of large areas.

c. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.

d. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

e. Access gates to be located at least 10 m from receptors where possible.

1.3.2. An **Outline Construction Traffic Management Plan (CTMP)** (**Appendix 5.1** of Volume 3 (document reference 6.3.5.1)) and **Framework Construction Worker Travel Plan (CWTP)** (Appendix 5.2 of Volume 3 (document reference 6.3.5.2) have

been prepared to manage the impacts associated with construction worker traffic HDV movements, and Abnormal Indivisible Loads (AIL).

1.3.3. The CTMP includes details of the HDV access routes and construction traffic management measures to ensure that heavy construction traffic does not pass along sensitive roads within the study area. The CTMP also identifies that the timing of large-scale vehicle movements associated with the delivery and removal of materials to avoid peak hours on the local road network would be beneficial, where practicable.

1.3.4. The CWTP includes details of the travel plan measures to be implemented to minimise the number of vehicle movements associated with construction workers, with the focus on encouraging car sharing and the use of contractor mini-buses. The proposed strategy to minimising construction worker vehicle trips reflects the location of the Site and is considered achievable and realistic.

1.4. RESIDUAL EFFECTS

1.4.1. 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 (not significant)**.