

Viking CCS pipeline

# Preliminary Environmental Information Report Volume IV

Technical Appendices



Appendix 14.1

# Construction Dust Methodology



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# 14 Construction Dust Methodology

## 14.1 Introduction

14.1.1 This section describes the technical method by which the air quality impact of the Viking CCS Pipeline (hereafter ‘the Project’) from construction phase particulate emissions has been considered.

## 14.2 Step 1: Screen the requirement for a detailed assessment

14.2.1 Sensitive receptors were identified and the distance to the site and construction routes were determined according to the examples of sensitivity shown in **Table 14-1**. According to the IAQM, an assessment will normally be required where there are sensitive receptors within 350 m of the boundary of a site and/or within 50 m of route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance.

14.2.2 A human receptor, as considered within the IAQM guidance, is any location where a person or property may experience:

- The annoyance effects of airborne dust or dust soiling e.g. dwellings, industrial or commercial premises such as a vehicle showroom, food manufacturers, electronics manufacturers, amenity areas and horticultural operations; or
- Exposure to PM<sub>10</sub> over a period relevant to the air quality objectives.

14.2.3 Ecological receptors within 50 m of the boundary of the site or routes used by construction vehicles on the public highway, up to 500 m from the site entrance, also need to be identified.

**Table 14-1: Definition of Sensitivity of Fugitive Dust and PM<sub>10</sub> Effects**

Sensitivity	Dust Soiling	Human Health	Ecological
High	Dwellings Museum and other culturally important collections, Medium- and long-term car parks Car showrooms	Residential properties. Hospitals, Schools Residential care homes	Locations with an international or national designation (e.g. SAC) and the designated features may be affected by dust soiling
Medium	Parks Places of work	Office and shop workers, but will generally not include workers occupationally exposed to PM <sub>10</sub> , as protection is covered by Health and Safety at Work legislation.	Locations with a national designation (e.g. SSSI) where the features may be affected by dust deposition
Low	Playing fields	Public footpaths Playing fields	Locations with a local designation where the

Sensitivity	Dust Soiling	Human Health	Ecological
	Farmland (unless commercially sensitive horticultural) Footpaths Short term car parks Roads	Parks Shopping streets	features may be affected by dust deposition, such as and LWS with dust sensitive features.
Key: SAC = Special Area of Conservation SSSI = Site of Special Scientific Interest LWS = Local Wildlife Site			

### 14.3 Step 2: Assess the Risk of Dust Impacts

14.3.1 The risk of dust arising in sufficient quantities to cause annoyance and/or health effects was determined for each activity (demolition, earthworks, construction works and track out), taking account of:

- The scale and nature of the works, which determines the potential dust emission magnitude (small, medium or large) (Step 2A); and
- The sensitivity of the area (low, medium or high (as defined in **Table 14-1**)) (Step 2B).

14.3.2 These factors were then combined to give the risk of dust effects with no mitigation applied, as Negligible, Low, Medium or High (as per the matrix shown in **Table 14-9**).

14.3.3 It should be noted that where detailed information was not available to inform the risk category, professional judgement and experience was used and a cautious approach adopted, in accordance with the guidance.

#### Step 2A: Determine the Dust Emissions Magnitude

##### Demolition

14.3.4 **Table 14-2** presents the demolition works dust emission classification. Demolition works will be minimal given the current state of the site.

**Table 14-2: Potential Demolition Works Dust Emission Classification**

Emissions Class	Criteria
Large	Total building volume >50,000 m <sup>3</sup> Potentially dusty construction material (e.g. concrete) On-site crushing and screening Demolition activities >20 m above ground level
Medium	Total building volume 20,000 m <sup>3</sup> – 50,000 m <sup>3</sup> Potentially dusty construction material Demolition activities 10-20 m above ground level
Small	Total building volume <20,000 m <sup>3</sup>

Emissions Class	Criteria
	Construction material with low potential for dust release (e.g. metal cladding or timber) Demolition activities <10 m above ground Demolition during wetter months

### Earthworks

14.3.5 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. The classifications in **Table 14-3** are based on examples of suitable criteria. Factors such as existing land use, topography, seasonality, duration and scale were also taken into consideration, where possible.

**Table 14-3: Potential Earthworks Dust Emission Classification**

Emissions Class	Criteria
Large	Total site area: >10,000 m <sup>2</sup> Potentially dusty soil type (e.g. clay) >10 heavy earth moving vehicle active at any one time Formation of bunds >8 m in height Total material moved >100,000 tonnes
Medium	Total site area: 2,500 - 10,000 m <sup>2</sup> Moderately dusty soil type (e.g. silt) 5 -10 heavy earth moving vehicle active at any one time Formation of bunds 4 - 8 m in height Total material moved 20,000 – 100,000 tonnes
Small	Total site area: <2,500 m <sup>2</sup> Soil type with large grain size (e.g. sand) < 5 heavy earth moving vehicle active at any one time Formation of bunds < 4 m in height Total material moved <20,000 tonnes Earthworks during wetter months

### Construction

14.3.6 The key issues when determining the potential dust emission magnitude during the construction phase include the size of the building(s)/ infrastructure, method of construction, construction materials and duration of build. The classifications in **Table 14-4** are based on examples of suitable criteria. Factors such as seasonality, building type, duration and scale were also taken into consideration, where possible.

**Table 14-4: Potential Construction Works Dust Emission Classification**

Emissions Class	Criteria
Large	Total building volume >100, 000 m <sup>3</sup> Onsite concrete batching Sandblasting
Medium	Total building volume 25,000 m <sup>3</sup> -100,000 m <sup>3</sup> Potentially dusty construction material (e.g. concrete) Onsite concrete batching
Small	Total building volume <25,000 m <sup>3</sup> construction Material with low potential for dust release (e.g. metal cladding or timber)

**Track-out**

14.3.7 Track-out is the transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the local road network. The classifications in **Table 14-5** are based on examples of suitable criteria. Factors such as vehicle size, speed, numbers, geology and duration were also taken into consideration, where possible.

**Table 14-5: Potential Track-out Works Dust Emission Classification**

Emissions Class	Criteria
Large	50 HGV (>3.5t) outward movements in any one day Potentially dusty surface material Unpaved road length > 100 m
Medium	25 – 100 HGV (>3.5t) outward movements in any one day Moderately dusty surface material Unpaved road length 50 – 100 m
Small	< 25 HGV (>3.5t) outward movements in any one day Surface material with low potential for dust release Unpaved road length < 50 m

**Step 2B: Define the Sensitivity of the Area**

14.3.8 The sensitivity of the area takes account of the following factors:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- In the case of PM<sub>10</sub>, the local background concentrations; and
- Site specific factors, such as whether there are natural shelters, such as trees to reduce the risk of wind-blown dust

14.3.9 The sensitivity of the area is determined separately for dust soiling impacts on people and properties (**Table 14-6**), human health impacts (**Table 14-7**) and ecology impacts (**Table 14-8**).

**Table 14-6: Sensitivity of the Area to Dust Soiling Effects on People and Property**

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

**Table 14-7: Sensitivity of the Area to Human Health Impacts**

Receptor Sensitivity	Annual Mean PM <sub>10</sub> Conc. (µg/m <sup>3</sup> )	Number of Receptors	Distance from Source (m)				
			< 20 m	< 50 m	< 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
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 -10	Low	Low	Low	Low	Low



**Table 14-8: Sensitivity of the Area to Ecological Impacts**

Receptor Sensitivity	Distance from Source	
	< 20 m	< 50 m
High	High	Medium
Medium	Medium	Low
Low	Low	Low

**Step 2C: Define the Risk of Impacts**

14.3.10 The dust emission magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to determine the risk of effects with no mitigation applied (Table 14-9). This Step is undertaken for each activity undertaken on site.

**Table 14-9: Dust Risk without Mitigation**

Activity	Sensitivity of Area	Dust Emission Classification		
		Large	Medium	Small
Demolition	High	High	Medium	Medium
	Medium	High	Medium	Low
	Low	Medium	Low	Negligible
Earthworks	High	High	Medium	Low
	Medium	Medium	Medium	Low
	Low	Low	Low	Negligible
Construction	High	High	Medium	Low
	Medium	Medium	Medium	Low
	Low	Low	Low	Negligible
Trackout	High	High	Medium	Medium
	Medium	Medium	Low	Negligible
	Low	Low	Low	Negligible

**14.4 Step 3: Identify the need for Site-Specific Mitigation**

14.4.1 Based on the risk of effects determined in Step 2C for each activity, appropriate site-specific mitigation measures were recommended. Appropriate mitigation measures are set out in the IAQM Guidance.

**14.5 Step 4: Define Impacts and Their Significance**

14.5.1 Finally, the significance of the potential residual dust impacts, i.e. after mitigation, was determined. According to the IAQM Guidance the residual impacts assumes that all

mitigation measures (recommended in Step 3) to avoid or reduce impacts are adhered to, and therefore the residual impacts should be 'not significant'.