ICT Paper Mill

Air Quality Modelling of Dust Emissions

Industrie Cartarie Tronchetti (ICT) UK Limited & Grag Hill Estates Ltd (CHEL)

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1.0

Introduction

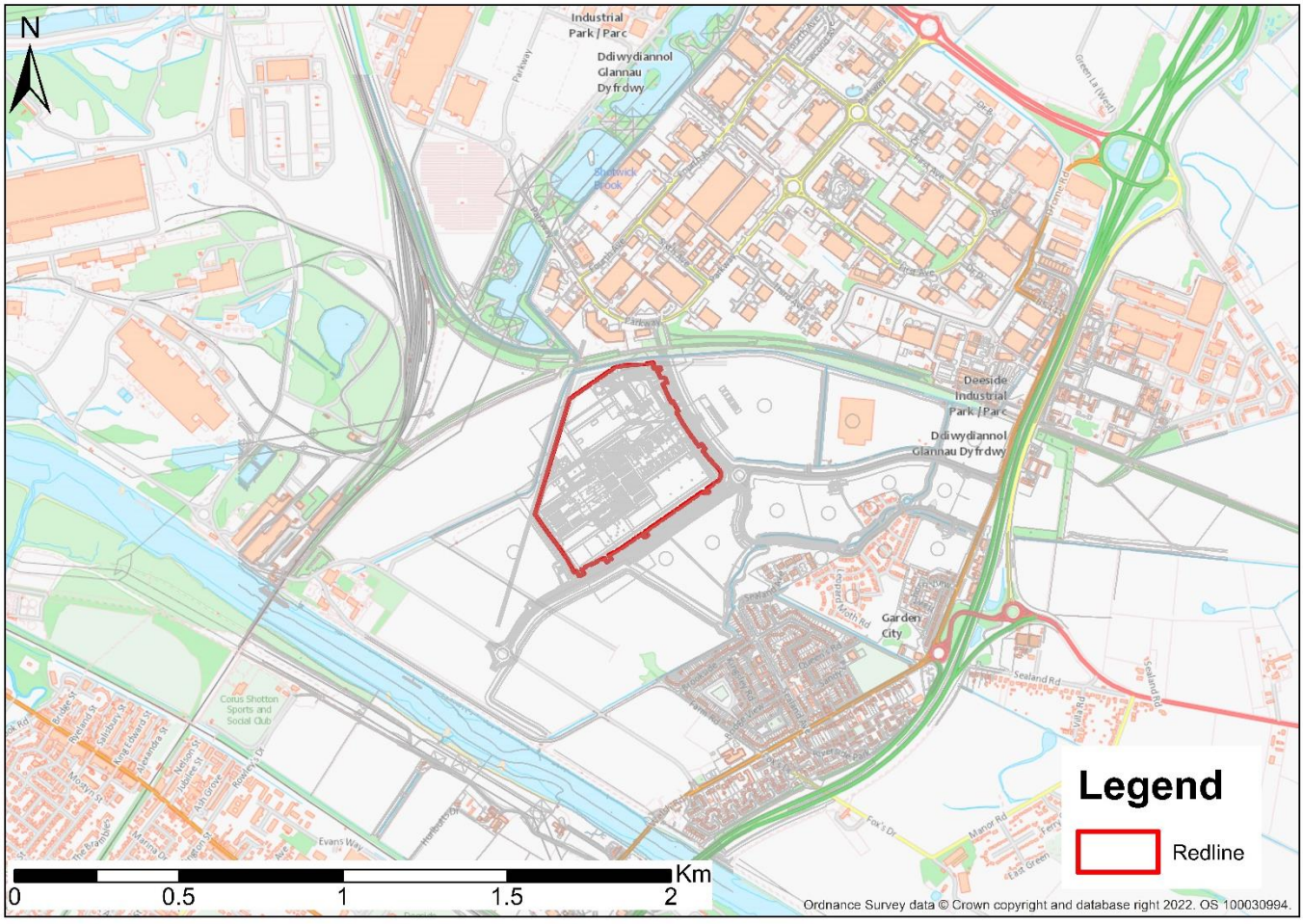
1.0 Introduction

As part of an Environmental Statement (ES) to accompany the planning application for the proposed ICT Paper Mill in Flintshire, Cundall prepared an Air Quality, Odour and Dust Technical Paper[1] on behalf of Industrie Cartarie Tronchetti (ICT) UK Limited and Crag Hill Estates Ltd (CHEL).

The ES Technical Paper described the baseline conditions at the Application Site and surroundings; the assessment methodology; the anticipated significant environmental effects associated with construction and operational phases; and the outline mitigation measures required to prevent, reduce, or offset any significant adverse effects. The Proposed Development/Application Site boundary is shown in Figure 1-1.

The assessment work carried out as part of the ES Technical Paper included detailed modelling of the operational traffic and the on-site combustion plant. The results of combustion plant modelling have been used to inform the permit application. Subsequent consultation with the permitting team has indicated an additional requirement to model the impact of dust emissions from the on-site dust management systems, trimming presses and trimming silos. This report presents the methodology and findings of a detailed assessment of emissions from the dust handling plant.

Figure 1-1 Proposed Development



[1] Cundall (2022) Paper Mill Facility, Plot C, Airfields, Northern Gateway, Environmental Statement Part 2 – Air Quality, Odour & Dust Technical Chapter Paper 8, Revision P04, 24 November 2021

2.0 Methodology

2.0 Methodology

2.1 Process Conditions

ICT have provided information on the proposed on-site equipment. This includes dust removal systems, trimming presses and trimming silos which all produce dust emissions. For each of the stages 1, 2 and 3, there will be dust removal systems (E15) and trimming silos (E16). There will also be two sets of dust removal systems (E4-E11) and trimming presses (E12) to be installed as part of the Stage 1 and Stage 3 designs, and also a dust removal system (E36), to be installed as part of Stage 1 only. The locations of the modelled units are shown in Figure 2-1 and listed in Table 2-1.

Emission Source		NGR	
		x	y
Dust removal system (E15)	PM1/E15	332063.4	369776.9
	PM2/E15	332125.8	369688.1
	PM3/E15	332152.1	369650.6
Trimming silos (E16)	PM1/E16	332022.8	369739.0
	PM2/E16	33204882	369645.7
	PM3/E16	332085.7	369593.1
Dust removal systems (E4, E5, E6, E7, E8, E9, E10, E11)	CV1/E4	332350.8	369871.2
	CV1/E5	332318.2	369848.4
	CV1/E6	332286.1	369826.4
	CV1/E7	332252.8	369805.0
	CV1/E8	332280.6	369902.1
	CV1/E9	332248.2	369879.6
	CV1/E10	332215.8	369857.0
	CV1/E11	332183.2	369834.3
	CV3/E6	332344.8	369742.9
	CV3/E5	332376.7	369765.3
	CV3/E4	332409.3	369788.0
	CV3/E7	332311.3	369721.6
	CV3/E8	332339.1	369818.8
	CV3/E9	332306.7	369796.2
	CV3/E10	332274.3	369773.6
	CV3/E11	332241.7	369751.1
Trimming presses (E12)	CV1/E12	332212.7	369880.9
	CV3/E12	332332.9	369709.7
Dust removal system (E36)	RW1/E36	332065.7	369816.5

Table 2-1: Location of Modelled PM_{10} Sources

The individual process conditions for each of this units are listed in Table 2-2. The process conditions listed are based on post embedded mitigation measures. The dust removal systems E15 and E36 are to have wet scrubbers and the remaining units listed are to have dry filters. Monitoring data for a similar site in Italy has been provided by ICT and shows that the PM_{10} emissions after the application of wet scrubbers were recorded to be between 0.6mg/m^3 and 1.4mg/m^3. An estimate limit value of 2mg/m^3 is therefore considered to be achievable for the units with wet scrubbers, but emissions of 5mg/m^3 have also been modelled as a worst case. PM_{10} emission limit values (ELV) for the dry filters are based on assumptions provided by the manufacturers that they can guarantee to achieve emission of 5mg/m^3 for 90% of the year and 10mg/m^3 for the remaining 10% of the year, when the filters are nearing replacement.

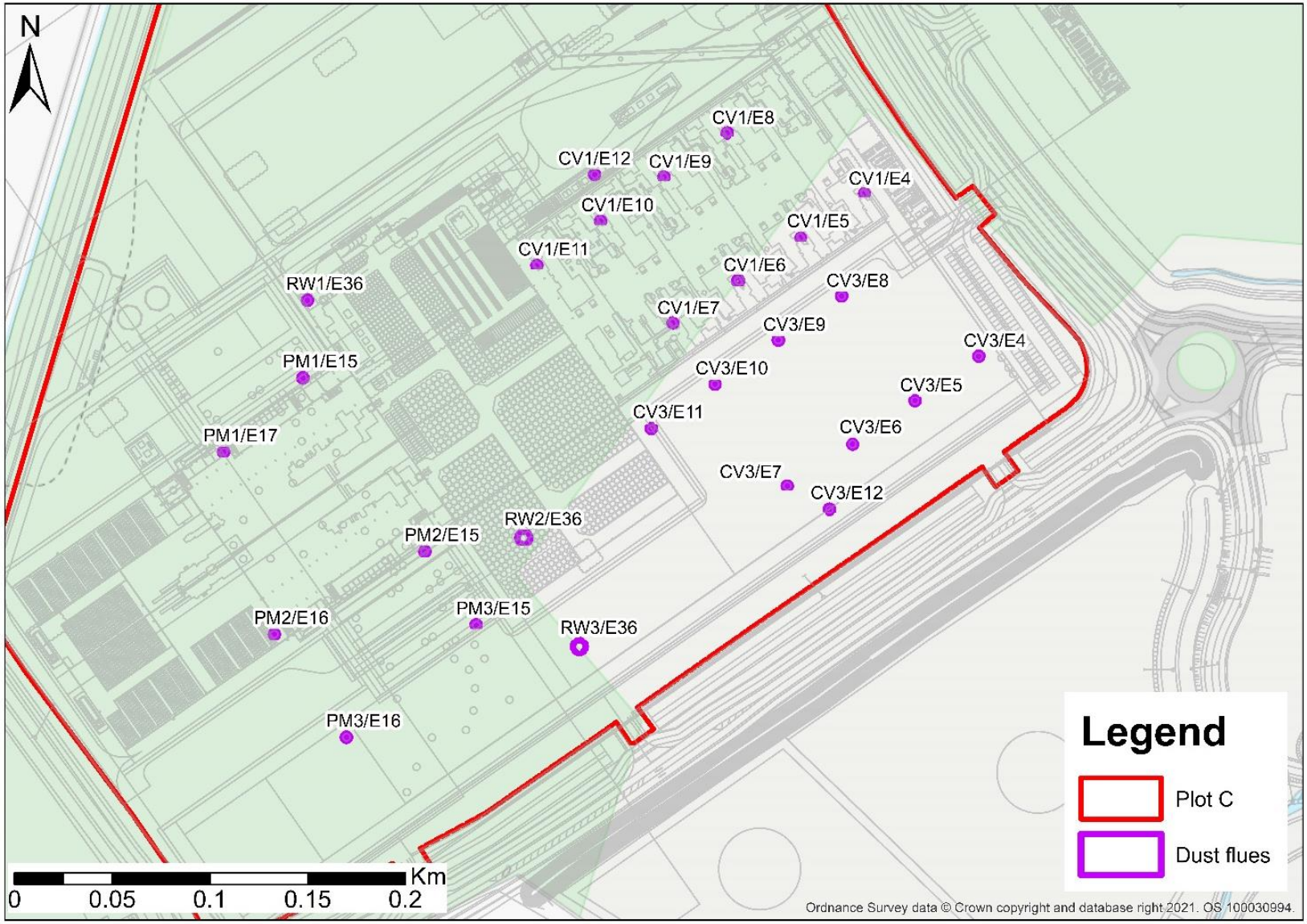


Figure 2-1: Modelled PM_{10} Emission Sources

Parameter	Unit	Dust removal system (E15)		Trimming silos (E16)		Dust removal systems (E4, E5, E6, E7, E8, E9, E10, E11)		Trimming presses (E12)		Dust removal system (E36)	
Operating hours	hr/yr	8760		8760		6240		6240		6240	
Exhaust flow	m^3/h	82,000		3,500		60,000		28,000		60,000	
Exhaust velocity*	m/s	7.25		13.75		14.74		15.47		6.55	
Exhaust temperature	ºC	Ambient		25		25		25		Ambient	
Flue diameter	m	2		0.3		1.2		0.8		1.8	
Emission limit value (ELV)**	mg/m^3	2	5	5	10	5	10	5	10	2	5
PM_{10} emission rate***	g/s	0.046	0.114	0.005	0.010	0.083	0.167	0.039	0.078	0.033	0.083
Stack height	m	28.5		20		22		13		24	
Mitigation	-	Wet scrubber		Dry filter		Dry filter		Dry filter		Wet scrubber	

Notes: * Exhaust velocity calculated as flow rate m^3/s divided by area in m^2

** PM_{10} emission limit values (ELV) for the dry filters are based on assumptions provided by the manufacturers that they can guarantee to achieve emission of $5mg/m^3$ for 90% of the year and $10mg/m^3$ for the remaining 10% of the year when the filters are close to needed replacement. For the units with wet scrubbers the emission limits of $2mg/m^3$ and $5mg/m^3$ have been modelled to demonstrate a worst-case range of results. ICT have provided data from another site that shows that post wet scrubber emissions can be expected to be $<1mg/m^3$. An estimate limit value $2mg/m^3$ is therefore considered to be achievable but emission of $5mg/m^3$ have also been modelled as a worst case.

*** PM_{10} emission rate calculated as flow rate m^3/s multiplied by ELV in mg/m^3

Table 2-2 Process Conditions of on-site sources of PM_{10}

2.1.1 Environment Agency Risk Assessment

Plant emissions were calculated using the methodology from the Department for Environment, Food & Rural Affairs (Defra) and Environment Agency (EA)'s air emission risk assessment2. The concentration of PM_{10} released into the air as a result of the on-site operational processes is known as the process contribution (PC).

The short-term and long-term PCs to air were calculated following the EA's risk assessment methodology. PC to air is measured in micrograms per cubic meter, µg/m^3. To calculate the PC to air, the dispersion factors, in micrograms per cubic metre per gram per second, are multiplied by the release rate, in grams per second. Calculations are based on all Phase 1, 2 and 3 units operating. The assumptions listed in section 2.1 have been applied, such as the dry filters achieving 5mg/m^3 for 90% of the year and 10mg/m^3 for the remaining 10% and the wet scrubbers achieving 2mg/m^3. The operational factors listed in Table 2-2 have also been applied to the relevant units.

As the stack heights range from 13m to 28.5m, effective heights of release of 10m, 20m and 30m have been selected. The dispersion factors for these effective heights of release are presented in Table 2-3.

Effective height of release	Annual Dispersion Factor (µg/m^3/g/s)	Hourly Dispersion Factor (µg/m^3/g/s)
10m	32	580
20m	4.6	161
30m	1.7	77

Table 2-3: Dispersion Factor

The process contribution (PC) was calculated by multiplying the dispersion factor (µg/m^3/g/s) by the release rate (g/s). The estimations of PC are presented in Table 2-4.

Release height (m)	Averaging period	Max PM_{10} PC (µg/m^3)	Threshold Criteria (µg/m^3) (% AQO in brackets)	PC screening
10m	**LT**	8.84	0.4 (1% AQO)	Above threshold criteria
	ST	160.2	50 (10% AQO)	Above threshold criteria
20m	**LT**	1.27	0.4 (1% AQO)	Above threshold criteria
	ST	44.5	50 (10% AQO)	Above threshold criteria
30m	**LT**	0.47	0.4 (1% AQO)	Below threshold criteria
	ST	21.3	50 (10% AQO)	Below threshold criteria

Table 2-4 PC Screening Calculation results

The EA spreadsheet-based results show that the PC for PM_{10} is likely to above the long-term and short-term criteria for release heights of 10m and 20m, but below the long-term and short-term criteria for release heights of 30m.

The Predicated Environmental Concentration (PEC) were estimated by combining the maximum PC for long-term and short-term with the background concentration, based on Defra PM_{10} background concentrations for the opening year of Phase 1 (2024) (9.69µg/m^3). For short-term concentrations, it is assumed the short-term background is twice the long-term background. The calculated PECs are listed in Table 2-5, along with the results of screening. The screened LT results meet the EA screening threshold criteria for 'insignificant', however, the ST concentrations exceed the threshold criteria for 'insignificant'. Detailed dispersion modelling has therefore been carried out.

[2] Defra / Environment Agency, Air emissions risk assessment for your environmental permit https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#calculate-pc-to-air

Release height (m)	Averaging period	Max PM_{10} PC ($\mu g/m^3$)	PEC ($\mu g/m^3$)	Threshold Criteria ($\mu g/m^3$) (% AQO in brackets)	PEC screening
10m	LT	8.84	18.5	28 (70% of AQO)	Below threshold criteria
	ST	160.2	179.56	6.1 (20% of AQO – twice LT background)	Above threshold criteria
20m	LT	1.27	11.0	28 (70% of AQO)	Below threshold criteria
	ST	44.5	63.8	6.1 (20% of AQO – twice LT background)	Above threshold criteria
30m	LT	0.47	10.2	28 (70% of AQO)	Below threshold criteria
	ST	21.3	40.7	6.1 (20% of AQO – twice LT background)	Above threshold criteria

Table 2-5: PEC Screening Calculation results

2.2 Dispersion Model

Detailed dispersion modelling of PM_{10} emissions has been carried out using the latest version of ADMS-Roads Extra (version 5.0.0.1), which is an internationally recognised new generation dispersion model developed by Cambridge Environmental Research Consultants (CERC). ADMS uses advanced algorithms to describe the boundary layer structure, turbulence and stability. The methodology for this is detailed in the following sections.

2.3 Meteorological Data

Hourly sequential meteorological data is required as an input to the model. Data from Liverpool Airport meteorological station for 2016, 2017, 2018, 2019 and 2020 were obtained for use in this assessment. Liverpool Airport is located approximately 15km to the north-east of the Proposed Development. Given its similar estuarine, near-coastal location, it is considered appropriate for use in this assessment.

Defra's LAQM.TG16[3] guidance recommends that meteorological data should only be used if the percentage of usable hours is greater than 75% and preferably greater than 90%. Unusable hours include missing hours and calm hours[4]. The 2016, 2017, 2018, 2019 and 2020 Liverpool Airport datasets have been checked for usability. The lines of usable hourly data and the percentage for the year are listed in Table 2-4. As the lines of usable hourly data for each of the years is well above the 90% threshold, the data is considered to be adequate for dispersion modelling, in accordance with LAQM TG16 guidance.

Year	Lines of usable hourly data	% of hourly year data
2015	8784	100%
2016	8760	100%
2017	8760	100%
2018	8760	100%
2019	8784	100%

Table 2-4 Usable Hourly Data from Met Files

Figure 2-3 shows the data as a windrose for each of the datasets from 2016 to 2020. It can be seen that the predominant wind direction varies between west and south

[3] Defra (2021) Local Air Quality Management Technical Guidance TG(16) April 2021 https://laqm.defra.gov.uk/documents/LAQM-TG16-April-21-v1.pdf
[4] Wind speeds <0.75m/s would be classed as calm. ADMS Roads sets the speed to 0.75m/s for speeds <0.75m/s and uses the wind direction from the previous hour. ADMS-5 does not model calm conditions, so data with wind speeds <0.75m/s are skipped in the modelling.

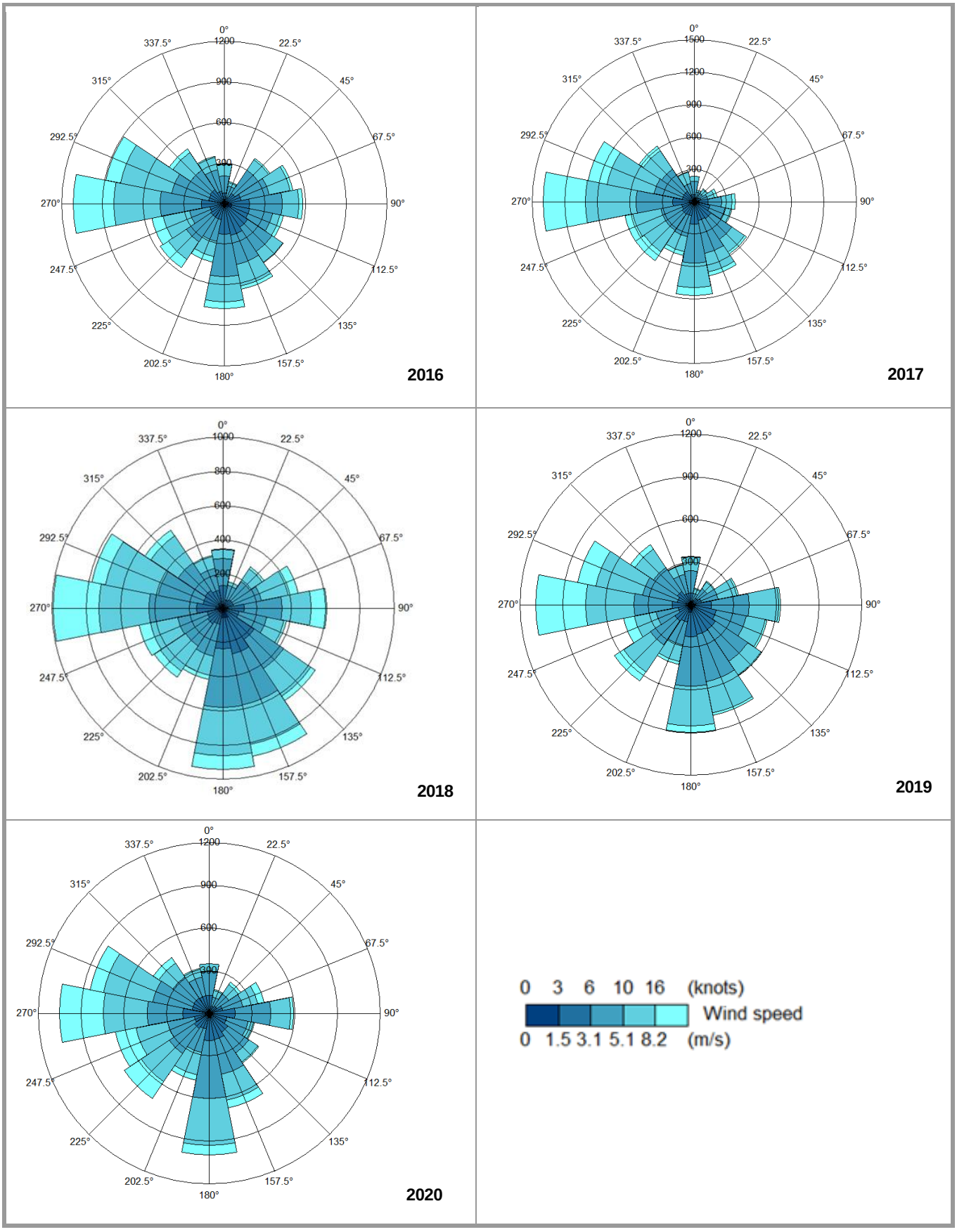


Figure 2-3: Windroses for Liverpool Airport, 2016 to 2020

2.4 Building Effects

Buildings can have a significant effect on the dispersion of pollutants from the flue. The presence of tall buildings close to a flue can cause the plume to be entrained in the cavity zone downwind of the building. This could result in higher ground concentrations near the flue than would be expected in the absence of buildings and can affect the dispersion of pollutants in the atmosphere. The presence of the buildings may induce better pollutant mixing and dispersion with ambient air, thereby resulting in lower concentrations further downwind.

The assessment has considered the buildings in the vicinity of the proposed flues. There are several buildings proposed for the site. Those that are taller than any of the flues have been included in the modelling due to their location and height are anticipated to have the main impact on dispersion. Sensitivity testing of buildings 4, 7, 10, 11 and 13 was carried out to determine which building should be set as the main building in the model. The highest concentrations were predicted with Building 4 as the main building. Building 4, which is between the main flues, has therefore been set as the main building.

Figure 2-2 shows the buildings which have been included within the dispersion model. Buildings can only be added to the dispersion model as rectangular or circular shapes; therefore, some simplification has been made. As the selected buildings are broadly rectangular, simplification is likely to be minimal. Details of building geometries included in the model are provided in Table 2-3.

ID	Coordinates		Height (m)	Length (m)	Width (m)	Angle of Building (degrees)*
	Easting	Northing				
1	332177	369997	13.25	107	31	146
2	332086	369942	39.65	95	176	146
3	332147	369597	20	102	40	58
4	332067	369713	20	102	80	58
5	332129	369619	13.7	102	10	58
6	332092	369674	13.7	102	9	58
7	332039	369751	13.7	102	9	58
8	332353	369897	12.15	118	12	146
9	332300	369804	11.65	211	180	146
10	332083	369798	14.7	60	22	146
11	332189	369715	11.65	194	104	146
12	332126	369828	11.65	60	82	146
13	332052	369539	10	90	50	58
14	331974	369651	10	102	96	149
15	332095	369568	12	12	50	58
16	332021	369679	12	102	9	149
Notes: * The angle of the building is the angle the “Length” makes with north, measured clockwise and is required for rectangular buildings						

Table 2-3 Modelled Buildings

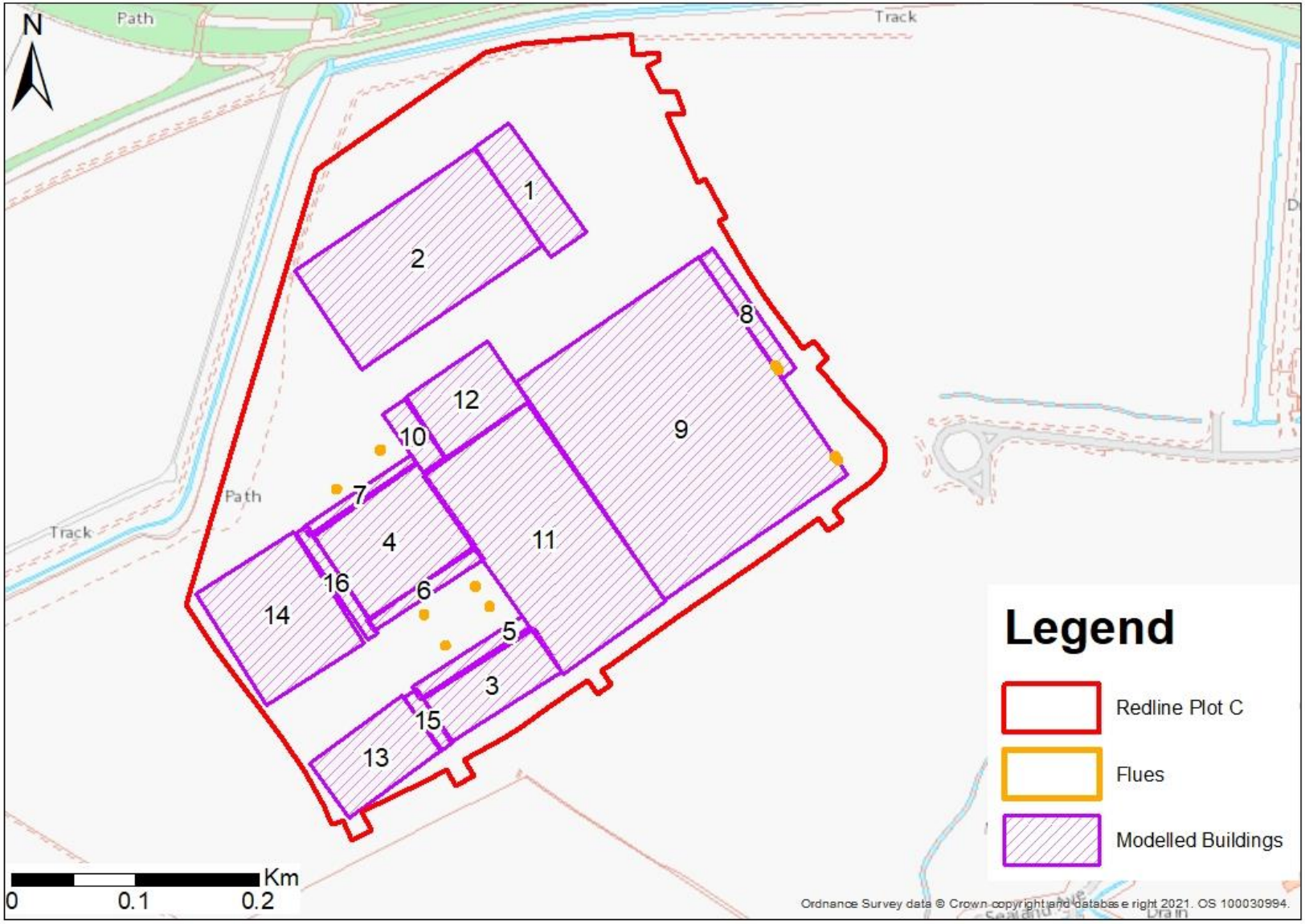


Figure 2-2: Modelled buildings

2.5 Topography and Terrain

Surface roughness is a component of surface texture. Air travelling over the surface is affected by the surface roughness, rough surface would result in higher roughness to smoother surfaces. Typical surface roughness values range from 1.5m (for cities, forests and industrial areas) to 0.0001m (for water or sandy deserts). The future setting of the Proposed Development has been considered in the modelling by setting the surface roughness length to 0.5m. This is the value recommended by the model developers for parkland and open suburbia. A lower surface roughness of 0.2m has been selected for the meteorological station, which is described in the model as representative of 'agricultural areas (min)'.

The Monin-Obukhov length is used to describe the effects of buoyancy on turbulence kinetic energy, particular in the lowest atmospheric boundary layer. This relates to the urban heat island effect, and its effects on turbulence due to surface topology and the effects from heated and shaded building surfaces. Monin-Obukhov values typically range from 2m to 10m in rural settings but can be higher in urban area where buildings and traffic results in more heat generation. In this assessment, the minimum Monin-Obukhov Length Scale for the Proposed Development and the meteorological station was set to 10 m (the recommended model setting for small towns).

Terrain Topographical features such as hills can have a significant effect on the dispersion of pollutants, generally when the ground level within 1 km of the sources varies by more than 100m (1 in 10). A review of the local area indicated a maximum difference in height of <30m. The use of terrain data was therefore excluded from further consideration within the assessment.

2.5.1 Receptors

2.5.2 Modelled Receptors

Worst-case locations were selected, such as those close to junctions and those closest to the road, in order to represent existing receptors within this assessment. In order to assess the impact of the PM_{10} emissions associated with on-site units, residential receptors have been selected including worst case residential properties closest to the proposed flues (receptors 9 and 12). The positions of the modelled residential receptors in relation to the modelled flues are shown in Figure 2-5 and Table 2-5. A height of 1.5m corresponds to a ground floor property.

Receptor ID	Receptor Address	Easting	Northing	Height (m)
1	4 Glan Y Fferi	332390	368803	1.5
2	Ysgol Gynradd Sealand Primary School	332538	368928	1.5
3	2 Farm Road	332586	368948	1.5
4	38 Welsh Road	332600	368915	1.5
5	23 Welsh Road	332682	368997	1.5
6	1 Welsh Road	333093	369260	1.5
7	93 Welsh Road	333160	369432	1.5
8	86 Sealand Avenue	332504	369360	1.5
9	Plot 9 proposed residential	332257	369497	1.5
10	Plot 6 proposed residential	332569	369747	1.5
11	Plot 2 proposed residential	333063	369796	1.5
12	Plot 8 proposed residential	332501	369702	1.5

Table 1-5: Modelled Receptors

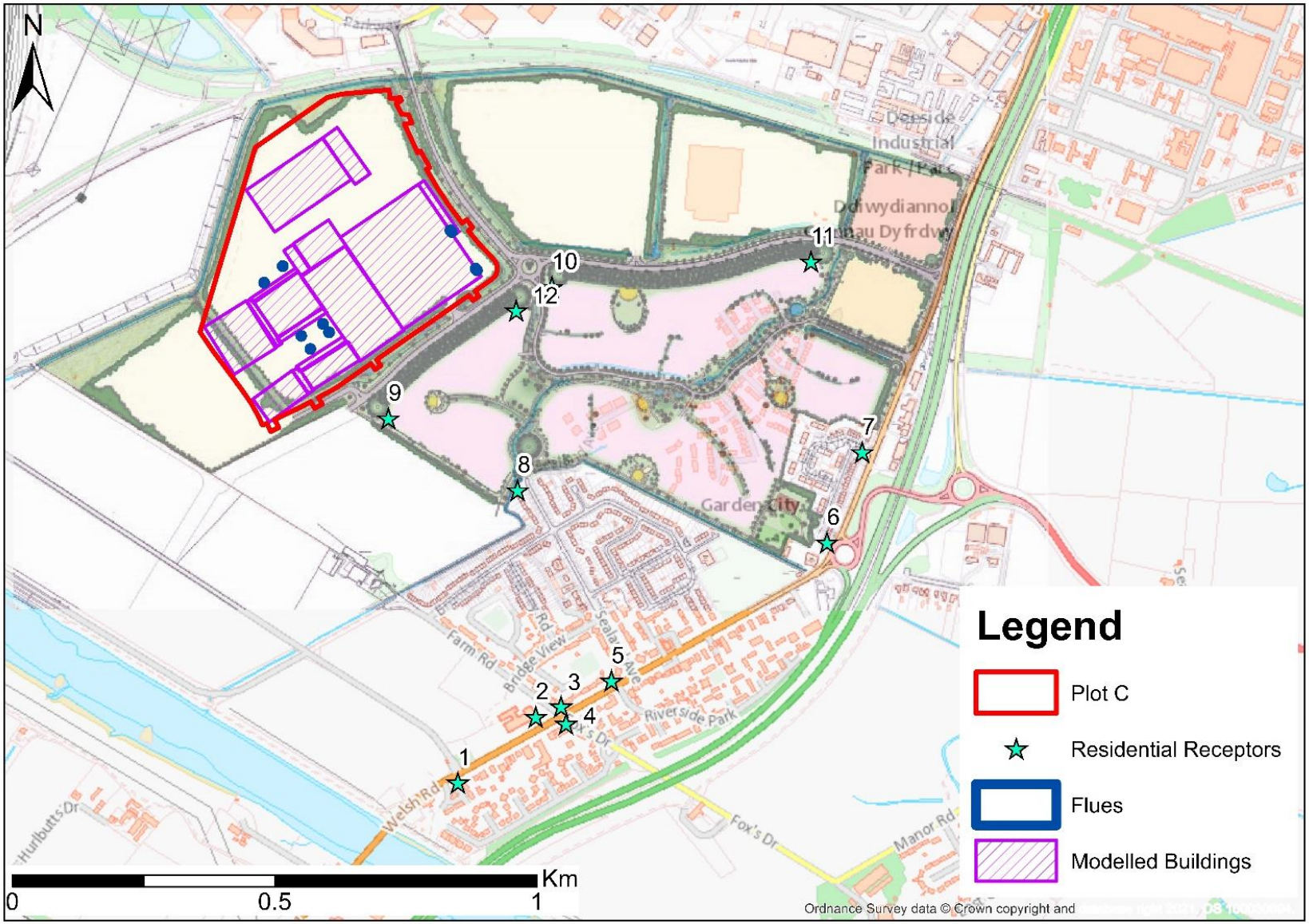


Figure 2-5 Modelled Receptor Locations

2.5.3 Model Domain

For the assessment of effects from the one-site combustion plant, a grid of regularly spaced receptors was created covering a domain of 2km x 2km area with a 10m grid spacing. This method ensures that potential impacts are assessed across the entire study area. The receptor grid has been modelled at a height of 1.5m to represent the breathing zone of the average adult. The assessment extent is shown in Figure 2-4.

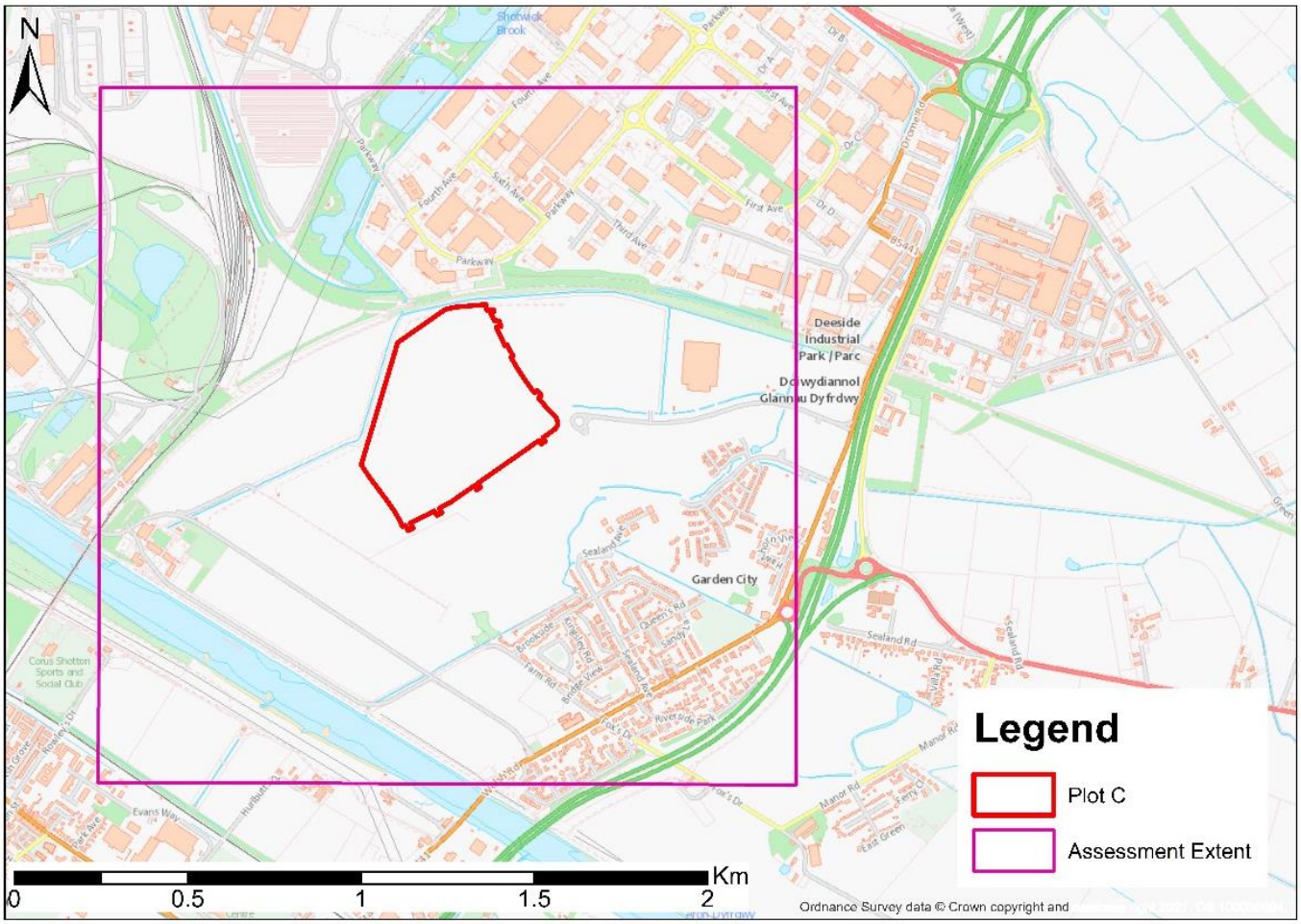


Figure 2-4 Assessment Extent

2.6 Background Pollutant Concentrations

Defra background concentrations were inputted into the model. Modelled runs were made using current year (2022) and future proposed opening year (2024 backgrounds). The modelled results therefore accounted for background PM_{10}. This is to enable a comparison to be made with the air quality threshold for annual mean concentrations. As Phases 2 and 3 are not proposed to be operational until 2025 to 2034, this is considered to be an overly conservative approach.

2.7 Results Processing

2.8 Assessment of Significance

2.8.1 Key Legislation

The results of dispersion modelling at sensitive residential receptors have been compared to relevant air quality objectives for the protection of human health listed in The Air Quality Standards Regulations 2010[5], which transposes formalised EU Limit Values set out in directive 2008/50/EC to UK law. The air quality UK Air Quality Objectives (AQOs) which apply to this assessment are shown in Table 2-6[6]. Some pollutants have long-term (annual mean) objectives due to the chronic way they affect human health, or the natural environment and others have short-term (1-hour, 24-hour mean) objectives due to the acute way they affect human health of the natural environment.

Pollutant	Averaging Period	Objective Threshold / EU Limit Value ($\mu g/m^3$)
Particulate Matter (PM_{10})	Annual mean	40
	24-hour mean	50 Not to be exceeded more than 35 times per year (equivalent to the 90.4th percentile of 24-hour mean values)

Table 2-6: Air Quality Objectives for PM_{10}

2.8.2 Determining Significance of Impact

A framework for describing the impacts is set out in IAQM guidance[7] The guidance contains a two stage process for determining the likely significant effects of the impacts on air quality:

- A qualitative or quantitative description of the impacts on local air quality arising from the development; and
- A judgement on the overall significance of the effects of any impacts.

A description of the impact is given based on the magnitude of change as a percentage of a relevant Air Quality Assessment Level (AQAL). Account must also be taken of predicted pollutant concentrations and their relationship to the Air Quality Objective / EU limit value for the pollutants of concern. For air quality impacts arising from surrounding sources on new occupants of a development, then the impacts are best described in relation to whether an air quality objective will not be met or is at risk of not being met. Where the air quality is such that an air quality objective at the building façade is not met, the effect on residents or occupants will be judged as significant, unless provisions is made to reduce their exposure by some means.

Table 2-7 below summarises the impact descriptors for annual mean PM_{10} concentrations. The impact descriptors may be adverse or beneficial depending upon whether concentrations are predicted to increase or decrease. Changes of <1%, i.e., less than 0.5%, will be described as Negligible.

[5] HMSO (2010). Statutory Instrument 2010 No. 1001, The Air Quality Standards Regulations 2010, London: HMSO

[6] Other pollutants have been screened out of this assessment as exceedance of their respective objectives is not anticipated to be associated with the pollutant sources of relevance to this assessment. $PM_{2.5}$ has not been included as the technical specification for the generators do not specify a $PM_{2.5}$ emission rate.

[7] IAQM Land-Use Planning & Development Control: Planning for Air Quality' (updated in January 2017)

Long-term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76 – 94% of AQAL	Negligible	Slight	Moderate	Moderate
95 – 102% of AQAL	Slight	Moderate	Moderate	Substantial
103 – 109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Table 2-6: Indicative Threshold for Requiring an Air Quality Assessment

The descriptors presented in Table 2-7 denote the impacts at individual sensitive receptor locations, however they do not provide a definitive conclusion on the significance of a specific effect. Usually, a major or moderate impact on air quality will be considered to have a significant effect, and a slight or negligible impact on air quality will not be considered as having a significant effect. However, the guidance makes it clear that the assessment of significance of the overall effect should be based on professional judgement, as is the case in this assessment

3.0

Impact Evaluation

3.0 Impact Evaluation

To assess the operational impact of particulate matter (PM_{10}) emissions from the on-site processes, dispersion modelling was undertaken following the methodology outlined in section 2.0. The results have been reported for combined impact of operation of Phases 1 and 2 only, and Phases 1, 2 and 3.

3.1 Phases 1 and 2 Only

3.1.1 Process Contributions from the Phase 1 and 2 ICT Units

The predicted process contributions (PC) to long-term (annual mean) PM_{10} concentrations associated with the operation of the dust emitting plant as part of Phase 1 and 2 only at each of the residential receptors are listed in Table 3-1 along with the Defra background concentrations for the opening year (2024).

The process contributions from the on-site dust emission sources are based on the process conditions listed in section 2.2, including the assumptions that the dry filters will achieve 5mg/m^3 for 90% of the year and 10mg/m^3 for the remain 10% of the year. Table 3-1 lists the results based wet scrubbers achieving 2mg/m^3 or 5mg/m^3, to demonstrate the reduced impact associated with a low emission limit for this units.

ID	Dry filters[8] & wet scrubber 2mg/m^3					Dry filters & wet scrubber 5mg/m^3				
	Defra background 2024 (µg/m^3)	With ICT emissions (µg/m^3)	ICT PC (µg/m^3)	Impact descriptor	% Change of AQAL	Defra background 2024 (µg/m^3)	With ICT emissions (µg/m^3)	ICT PC (µg/m^3)	Impact descriptor	% Change of AQAL
1	11.9	12.0	0.1	Negligible	0.3	11.9	12.0	0.1	Negligible	0.3
2	11.9	12.0	0.1	Negligible	0.3	11.9	12.0	0.2	Negligible	0.5
3	11.9	12.0	0.1	Negligible	0.3	11.9	12.0	0.2	Negligible	0.5
4	11.9	12.0	0.1	Negligible	0.3	11.9	12.0	0.2	Negligible	0.5
5	11.9	12.0	0.2	Negligible	0.5	11.9	12.1	0.2	Negligible	0.5
6	11.4	11.6	0.2	Negligible	0.5	11.4	11.7	0.3	Negligible	0.8
7	11.4	11.7	0.3	Negligible	0.8	11.4	11.7	0.3	Negligible	0.8
8	10.1	10.4	0.3	Negligible	0.8	10.1	10.6	0.5	Negligible	1.3
9	10.1	10.5	0.4	Negligible	1.0	10.1	10.6	0.5	Negligible	1.3
10	10.1	11.3	1.2	Negligible	3.0	10.1	11.5	1.4	Negligible	3.5
11	11.4	11.7	0.3	Negligible	0.8	11.4	11.8	0.4	Negligible	1.0
12	10.1	11.3	1.2	Negligible	3.0	10.1	11.6	1.5	Negligible	3.8

Table 3-1: Predicted PM_{10} concentrations (µg/m^3) at modelled receptors, combined impact of Phases 1, 2 and 3, wet scrubbers achieving emission limits of 2mg/m^3 or 5mg/m^3

Based on the total predicted PM_{10} concentrations and the magnitude of change, the impact due to the operation of the Proposed Development is *negligible* at all sensitive receptors. The total concentrations including 2024 Defra backgrounds and the process contributions from ICT operations are all well below the PM_{10} annual mean objective (40µg/m^3), with a maximum of 12.1µg/m^3 predicted at receptor 5, using assuming the wet scrubbers meet an emission limit value (ELV) of 5mg/m^3. This reduces to 12.0µg/m^3 assuming wet scrubbers achieve emissions of 2mg/m^3.

[8] Units with dry filters assumed to emit at 5mg/m^3 for 90% of the year and 10mg/m^3 for 10% of the year

As the total concentrations are less than 75% of the annual mean objective (30µg/m^3), and the maximum percentage change in concentrations relative to the air quality assessment level (AQAL) is <6% at all receptors, a negligible impact is predicted at all receptors. The impact of PM_{10} emissions associated with the operation of Phases 1 and 2 is therefore not considered to be significant.

3.1.2 Phase 1 and 2 Units including Operational Traffic

Table 3-2 lists the annual mean concentrations including 2024 traffic emissions for do-minimum (without the proposed development) and do-something (with the proposed development) with ICT emissions based on wet scrubbers achieving 2mg/m^3 or 5mg/m^3. The do-minimum values listed include contributions from traffic emissions without the Proposed Development, and do-something concentrations include contribution from traffic emission including those associated with the operation of the Proposed Development. The methodology for the operational traffic assessment is detailed in the Environmental Statement Air Quality, Odour and Dust Technical Paper Chapter.

ID	Dry filters & wet scrubber 2mg/m^3					Dry filters & wet scrubber 5mg/m^3				
	DM PM_{10} annual mean (µg/m^3)	DS PM_{10} annual mean (µg/m^3)	Total Change (µg/m^3)	Impact descriptor	% Change of AQAL	DM PM_{10} annual mean (µg/m^3)	DS PM_{10} annual mean (µg/m^3)	Total Change (µg/m^3)	Impact descriptor	% Change of AQAL
1	13.8	13.9	0.1	Negligible	0.2	13.8	14.0	0.1	Negligible	0.4
2	14.8	14.9	0.1	Negligible	0.3	14.8	15.0	0.2	Negligible	0.5
3	17.3	17.4	0.1	Negligible	0.3	17.3	17.6	0.2	Negligible	0.5
4	17.2	17.3	0.1	Negligible	0.3	17.2	17.5	0.2	Negligible	0.5
5	15.7	15.8	0.2	Negligible	0.4	15.7	16.0	0.2	Negligible	0.5
6	13.5	13.7	0.2	Negligible	0.6	13.5	13.9	0.3	Negligible	0.7
7	12.3	12.6	0.3	Negligible	0.6	12.3	12.9	0.3	Negligible	0.8
8	10.3	10.7	0.3	Negligible	0.8	10.3	11.0	0.5	Negligible	1.2
9	10.3	10.6	0.4	Negligible	0.9	10.3	11.0	0.5	Negligible	1.4
10	10.3	11.5	1.2	Negligible	3.1	10.3	13.1	1.4	Negligible	3.6
11	11.7	12.1	0.3	Negligible	0.8	11.7	12.4	0.4	Negligible	1.0
12	10.3	11.5	1.2	Negligible	3.0	10.3	13.4	1.5	Negligible	3.7

Table 3-2: Predicted PM_{10} concentrations (µg/m^3) at modelled receptors, combined impact of Phases 1, 2 and 3, including operational traffic

Based on the total predicted PM_{10} concentrations and the magnitude of change, the impact due to the operation of the Proposed Development accounting for additional contribution from operational traffic is *negligible* at all sensitive receptors. The total concentrations including 2024 Defra backgrounds, as well as the process contributions from both ICT operations and traffic emissions, are all well below the PM_{10} annual mean objective (40µg/m^3), with a maximum of 17.6µg/m^3 at receptor 3 assuming the wet scrubbers achieve emission limit of 5mg/m^3. This reduces to 17.4µg/m^3 assuming wet scrubbers achieve emissions of 2mg/m^3.

As the total concentrations are less than 75% of the annual mean objective (30µg/m^3) and the percentage change in concentrations relative to the air quality assessment level (AQQL) is <6%, a negligible impact is predicted at all receptors. The impact of PM_{10} emissions associated with the operation of Phases 1 and 2, accounting for operational traffic, is therefore not considered to be significant.

3.2 Phases 1, 2, 3

3.2.1 Process Contributions from the Phase 1, 2 and 3 ICT Units

The predicted process contributions to long-term (annual mean) PM_{10} concentrations associated with the operation of the dust emitting plant as part of Phase 1, 2 and 3 at each of the residential receptors are listed in Table 3-3 along with the Defra background concentrations for the opening year (2024).

The process contributions (PC) from the on-site dust emission sources are based on the process conditions listed in section 2.2, including the assumptions that the dry filters will achieve 5mg/m^3 for 90% of the year and 10mg/m^3 for the remaining 10% of the year. Table 3-1 lists the results based on wet scrubbers achieving 2mg/m^3 or 5mg/m^3, to demonstrate the reduced impact associated with a lower emission limit for these units.

ID	Dry filters & wet scrubber 2mg/m^3					Dry filters & wet scrubber 5mg/m^3				
	Defra background 2024 (µg/m^3)	With ICT emissions (µg/m^3)	ICT PC (µg/m^3)	Impact descriptor	% change of AQAL	Defra background 2024 (µg/m^3)	With ICT emissions (µg/m^3)	ICT PC (µg/m^3)	Impact descriptor	% change of AQAL
1	11.9	12.0	0.2	Negligible	0.5	11.9	12.1	0.2	Negligible	0.5
2	11.9	12.1	0.2	Negligible	0.6	11.9	12.2	0.3	Negligible	0.8
3	11.9	12.1	0.3	Negligible	0.7	11.9	12.2	0.3	Negligible	0.8
4	11.9	12.1	0.2	Negligible	0.6	11.9	12.2	0.3	Negligible	0.8
5	11.9	12.1	0.3	Negligible	0.7	11.9	12.2	0.4	Negligible	1.0
6	11.4	11.9	0.4	Negligible	1.1	11.4	12.0	0.5	Negligible	1.3
7	11.4	11.9	0.5	Negligible	1.3	11.4	12.0	0.6	Negligible	1.5
8	10.1	10.8	0.7	Negligible	1.7	10.1	11.0	0.9	Negligible	2.3
9	10.1	10.8	0.7	Negligible	1.7	10.1	11.1	1.0	Negligible	2.5
10	10.1	12.9	2.8	Slight adverse	7.1	10.1	13.2	3.1	Slight adverse	7.8
11	11.4	12.1	0.7	Negligible	1.7	11.4	12.2	0.8	Negligible	2.0
12	10.1	13.2	3.1	Slight adverse	7.7	10.1	13.6	3.5	Slight adverse	8.8

Table 3-3: Predicted PM_{10} concentrations (µg/m^3) at modelled receptors, combined impact of Phases 1, 2 and 3, wet scrubbers achieve emission limits of 2mg/m^3 or 5mg/m^3

Based on the total predicted PM_{10} concentrations and the magnitude of change, the impact due to the operation of the Proposed Development is *negligible* at all sensitive receptors, apart from 10 and 12. A slight impact is predicted at these locations, with a maximum change/process contribution (PC) of 3.5µg/m^3 being predicted at receptor 12, which is the nearest proposed residential property. This reduces to 3.1µg/m^3 assuming the wet scrubbers achieve an emission limit of 2mg/m^3. Based on the emission data provided for a similar site in Italy, it is assumed that an emission limit of 2mg/m^3 is achievable using the wet scrubbers.

The total concentrations including 2024 Defra backgrounds and the process contributions from ICT operations are all well below the PM_{10} annual mean objective (40µg/m^3), with a maximum of 13.6µg/m^3 predicted at receptor 12 and assuming wet scrubbers achieve 5mg/m^3. This reduces to 13.2µg/m^3 assuming wet scrubbers achieve emissions of 2mg/m^3. As the total concentrations are less than 75% of the annual mean objective (30µg/m^3), a slight adverse impact is predicted as the percentage change in concentrations relative to the air quality assessment level (AQQL) is between 6 and 10%. Assuming an emission limit of 2mg/m^3 is achievable for the wet scrubbers, which is considered likely based on available data, the maximum percentage change of 7.7% is only slightly higher than 6%. Given that the total concentrations are all well below the annual mean objective (40µg/m^3), the impact of PM_{10} emissions associated with the operation of Phases 1, 2 and 3 is therefore not considered to be significant.

3.2.2 Phase 1, 2 and 3 including Operational Traffic

Table 3-4 lists the annual mean concentrations including 2024 traffic emissions for do-minimum (without the proposed development) and do-something (with the proposed development) with ICT emissions based on wet scrubbers achieving 2mg/m^3 or 5mg/m^3. The do-minimum values listed include contributions from traffic emissions without the Proposed Development and do-something concentrations include contribution from traffic emission including those associated with the operation of the Proposed Development. The methodology for the operational traffic assessment is detailed in the Environmental Statement Air Quality, Odour and Dust Technical Paper Chapter.

ID	Dry filters & wet scrubber 2mg/m^3					Dry filters & wet scrubber 5mg/m^3				
	DM PM_{10} annual mean (µg/m^3)	DS PM_{10} annual mean (µg/m^3)	Total Change (µg/m^3)	Impact descriptor	% Change of AQAL	DM PM_{10} annual mean (µg/m^3)	DS PM_{10} annual mean (µg/m^3)	Total Change (µg/m^3)	Impact descriptor	% Change of AQAL
1	13.8	14.0	0.2	Negligible	0.5	13.8	14.0	0.2	Negligible	0.6
2	14.8	15.0	0.2	Negligible	0.5	14.8	15.1	0.3	Negligible	0.8
3	17.3	17.6	0.3	Negligible	0.8	17.3	17.6	0.3	Negligible	0.8
4	17.2	17.5	0.2	Negligible	0.5	17.2	17.5	0.3	Negligible	0.8
5	15.7	16.0	0.3	Negligible	0.8	15.7	16.1	0.4	Negligible	1.0
6	13.5	13.9	0.4	Negligible	1.0	13.5	14.0	0.5	Negligible	1.4
7	12.3	12.9	0.5	Negligible	1.3	12.3	13.0	0.6	Negligible	1.6
8	10.3	11.0	0.7	Negligible	1.8	10.3	11.2	0.9	Negligible	2.2
9	10.3	11.0	0.7	Negligible	1.8	10.3	11.2	1.0	Negligible	2.4
10	10.3	13.1	2.8	Slight adverse	7.0	10.3	13.4	3.1	Slight adverse	7.8
11	11.7	12.4	0.7	Negligible	1.8	11.7	12.5	0.8	Negligible	1.9
12	10.3	13.4	3.1	Slight adverse	7.8	10.3	13.8	3.5	Slight adverse	8.7

Table 3-4: Predicted PM_{10} concentrations (µg/m^3) at modelled receptors, combined impact of Phases 1, 2 and 3 including traffic emissions

Based on the total predicted PM_{10} concentrations and the magnitude of change, the impact due to the operation of the Proposed Development is *negligible* at all sensitive receptors apart from 10 and 12. Accounting for ICT emissions from operational units and traffic, a slight adverse impact is predicted at these locations, with a maximum change of 3.5µg/m^3 predicted at receptor 12 (the nearest proposed residential property). If we assume that the wet scrubbers achieve an emission limit of 2mg/m^3, the impact reduces to 3.1µg/m^3. Based on the emission data provided for a similar site in Italy, it is assumed that an emission limit of 2mg/m^3 is achievable for the wet scrubbers.

The total concentrations including 2024 Defra backgrounds, as well as the process contributions from both ICT operations and traffic emissions, are all well below the PM_{10} annual mean objective (40µg/m^3), with a maximum of 17.6µg/m^3 predicted at receptor 3. As the total concentrations are less than 75% of the annual mean objective (30µg/m^3), a slight adverse impact is predicted is the percentage change in concentrations relative to the AQAL is between 6 and 10%. Assuming an emission limit of 2mg/m^3 is achievable for the wet scrubbers, which is considered likely based on available data, the maximum percentage change of 7.8% is only slightly higher than 6%. Given that the total concentrations are all well below the annual mean objective (40µg/m^3), the impact of PM_{10} emissions associated with the operation of Phases 1, 2 and 3 is therefore not considered to be significant.

3.2.3 Short-term PM_{10}

Table 3-5 lists the PM_{10} annual mean, 90.4th percentile of 24-hour mean values including 2024 Defra background concentrations. These are based on worst case conditions, assuming all units will operation all year 24 hours per day and the emission limits for the dry filters will be 10mg/m^3, when in reality the dry filters are expected to emit 5mg/m^3 for 90% of the year. Results are listed for the wet scrubbers emitting 5mg/m^3, as a worse case, or a more likely 2mg/m^3.

ID	Defra background 2024 (µg/m^3)	Dry filters 10mg/m^3, wet scrubbers 5mg/m^3			Dry filters 10mg/m^3, wet scrubbers 2mg/m^3		
		PM_{10} annual mean (µg/m^3)	90.4th percentile (µg/m^3)	No. of 24-hour mean exceedances	PM_{10} annual mean (µg/m^3)	90.4th percentile (µg/m^3)	No. of 24-hour mean exceedances
1	11.9	10.4	11.9	2.9	10.1	11.1	3.4
2	11.9	10.6	12.6	2.7	10.2	11.6	3.2
3	11.9	10.6	12.7	2.6	10.3	11.7	3.1
4	11.9	10.6	12.6	2.7	10.2	11.6	3.2
5	11.9	10.7	12.9	2.5	10.3	11.9	3.0
6	11.4	11.2	14.0	2.0	10.7	13.1	2.5
7	11.4	11.4	14.4	1.8	10.9	13.4	2.3
8	10.1	11.9	16.5	1.2	11.1	14.4	2.0
9	10.1	12.0	17.1	1.1	11.1	13.8	2.1
10	10.1	17.7	32.0	1.2	16.6	29.6	0.6
11	11.4	11.7	15.2	1.4	11.3	14.2	1.8
12	10.1	18.5	35.2	1.8	17.1	32.0	0.8

Table 3-5: Predicted 90.4th percentile of 24-hour mean PM_{10} concentrations (µg/m^3) at modelled receptors

The maximum 90.4th percentile is 35.2µg/m^3 at receptor 12, which is lower than the short-term objective (50µg/m^3). This is based on worst case conditions or all units operating continuously and emitting at 10mg/m^3. Assuming the wet scrubbers emit at 2mg/m^3, this reduces to 32.0µg/m^3.

In accordance with TG(16) guidance the following calculation has been made to predict the likely number of 24-hour mean exceedances, based on the predicted annual mean concentrations.

$$\text{No. 24-hour mean exceedances} = -18.5 + 0.00145 \times \text{annual mean}^3 + (206/\text{annual mean})$$

The maximum number of 24-hour mean exceedances (50 µg/m^3) not to be exceed more than 35 times in a year is 3.4 at receptor 1, which is well below the permissible 35. It is therefore unlikely that the short-term PM_{10} objective would be exceeded at the site.

3.2.4 Gridded Results

Figure 3-1 shows the total PM_{10} concentrations (predicted annual mean PM_{10} concentrations including Defra 2024 backgrounds) based on all units operating continuously with emitting at 10mg/m^3. As shown in the plot, the off-site total concentrations are <21µg/m^3.

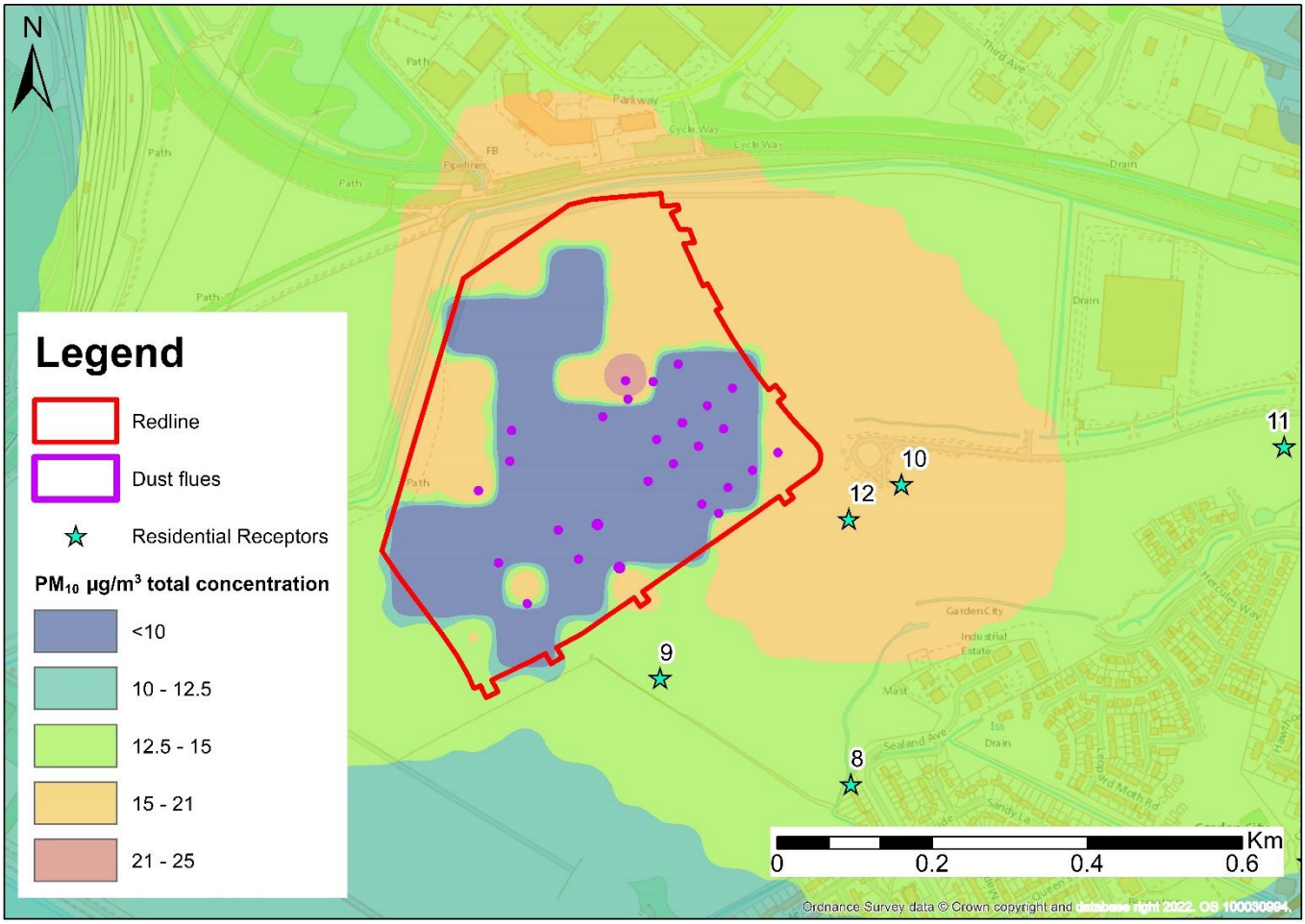


Figure 3-1 Total annual mean PM_{10} concentrations dry filters emitting at 10mg/m^3 and the wet scrubbers at 2mg/m^3.

3.3 Environment Agency Risk Assessment

3.3.1 Long-term PM_{10} concentrations

The results of dispersion modelling have been assessed against the Defra/ Environment Agency Plant's air emission risk assessment. The predicted process contributions (PC) of PM_{10} released into the air as a result of the on-site operational processes[9] at each of the modelled receptors are listed in Table 3-6 and Table 3-7, for those units associated with Phase 1 and 2 only (Table 3-6) and those associated with Phases 1, 2 and 3 (Table 3-7). The tables include the PM_{10} environmental assessment level (EAL)[10], Defra 2024 background concentrations, process contributions (PC), predicted environmental concentration (PEC) and how the PC and PEC compared to the EAL. Results are listed based on the wet scrubbers achieving emission limits of 5mg/m^3, or more likely 2mg/m^3, as per the previous sections.

The majority of PCs are also below 1% of the EAL, excluding the PCs for receptors 10 and 12 for Phases 1, 2 and 3, which are slightly above 1% of the EAL (4µg/m^3). However, all of the predicted PECs are well below the EAL (40µg/m^3). The impact of the on-site dust emitting processes on long-term PM_{10} concentrations is therefore considered to be insignificant.

3.3.2 Short-term PM_{10} Concentrations

The predicted short-term predicted environmental concentrations (PEC) of PM_{10} released into the air as a result of the on-site operational processes[11] at each of the modelled receptors are listed in Table 3-8 and Table 3-9, for those units associated with Phase 1 and 2 only (Table 3-8) and those associated with Phases 1, 2 and 3 (Table 3-9). This are based on the 90.4th percentile of 24-hour means for comparison with the PM_{10} short-term objective (50 µg/m^3), as outlined in Table 2-6. An average of the Defra background concentrations for 2024 (11.2µg/m^3) have been included in the model runs, results are therefore reported as predicted environmental concentrations (PEC).

All of the predicted short-term PECs are well below the short-term EAL (50µg/m^3), with a maximum of 36.5µg/m^3 predicted at receptor 12 based on all phases operating and wet scrubbers only achieving 5mg/m^3. The impact of the on-site dust emitting processes on short-term PM_{10} concentrations is therefore considered to be insignificant.

[9] Emission from the site, does not include off-site traffic emissions

[10] EALs for PM_{10} are based on the Ambient Air Directive Limit Values, https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#environmental-standards-for-air-emissions

[11] Emission from the site, does not include off-site traffic emissions

Receptor ID	EAL for PM_{10} (µg/m³)	Defra background 2024 (µg/m³)	Dry filters[12] & wet scrubber 2mg/m³					Dry filters & wet scrubber 5mg/m³				
			ICT PC (µg/m³)	PC as % of EAL	With ICT emissions (µg/m³) (PEC)	PC > 1% of EAL (4µg/m³)	PEC > EAL?	ICT PC (µg/m³)	PC as % of EAL	With ICT emissions (µg/m³) (PEC)	PC > 1% of EAL (4µg/m³)	PEC > EAL?
1	40	11.9	0.1	0.3	12.0	No	No	0.1	0.3	12.0	No	No
2	40	11.9	0.1	0.3	12.0	No	No	0.2	0.5	12.1	No	No
3	40	11.9	0.1	0.3	12.0	No	No	0.2	0.5	12.1	No	No
4	40	11.9	0.1	0.3	12.0	No	No	0.2	0.5	12.1	No	No
5	40	11.9	0.2	0.5	12.1	No	No	0.2	0.5	12.1	No	No
6	40	11.4	0.2	0.5	11.6	No	No	0.3	0.8	11.7	No	No
7	40	11.4	0.3	0.8	11.7	No	No	0.3	0.8	11.7	No	No
8	40	10.1	0.3	0.8	10.4	No	No	0.5	1.3	10.6	No	No
9	40	10.1	0.4	1.0	10.5	No	No	0.5	1.3	10.6	No	No
10	40	10.1	1.2	3.0	11.3	No	No	1.4	3.5	11.5	No	No
11	40	11.4	0.3	0.8	11.7	No	No	0.4	1.0	11.8	No	No
12	40	10.1	1.2	3.0	11.3	No	No	1.5	3.8	11.6	No	No

Table 3-6: Comparison of modelled PCs and PECs against EALs - Phases 1 and 2 only

[12] Units with dry filters assumed to emit at 5mg/m³ for 90% of the year and 10mg/m³ for 10% of the year

Receptor ID	EAL for PM_{10} (µg/m³)	Defra background 2024 (µg/m³)	Dry filters Wet scrubber 2mg/m³					Dry filters Wet scrubber 5mg/m³				
			ICT PC (µg/m³)	PC as % of EAL	With ICT emissions (µg/m³) (PEC)	PC > 1% of EAL (4µg/m³)	PEC > EAL?	ICT PC (µg/m³)	PC as % of EAL	With ICT emissions (µg/m³) (PEC)	PC > 1% of EAL (4µg/m³)	PEC > EAL?
1	40	11.9	0.2	0.5	12.0	No	No	0.2	0.5	12.1	No	No
2	40	11.9	0.2	0.5	12.1	No	No	0.3	0.8	12.2	No	No
3	40	11.9	0.3	0.8	12.1	No	No	0.3	0.8	12.2	No	No
4	40	11.9	0.2	0.5	12.1	No	No	0.3	0.8	12.2	No	No
5	40	11.9	0.3	0.8	12.1	No	No	0.4	1.0	12.2	No	No
6	40	11.4	0.4	1.0	11.9	No	No	0.5	1.3	12.0	No	No
7	40	11.4	0.5	1.3	11.9	No	No	0.6	1.5	12.0	No	No
8	40	10.1	0.7	1.8	10.8	No	No	0.9	2.3	11.0	No	No
9	40	10.1	0.7	1.8	10.8	No	No	1.0	2.5	11.1	No	No
10	40	10.1	2.8	7.0	12.9	Yes	No	3.1	7.8	13.2	Yes	No
11	40	11.4	0.7	1.8	12.1	No	No	0.8	2.0	12.2	No	No
12	40	10.1	3.1	7.8	13.2	Yes	No	3.5	8.8	13.6	Yes	No

Table 3-7: Comparison of modelled PCs and PECs against EALs - Phases 1, 2 and 3

ID	Short-term EAL for PM_{10} ($\mu g/m^3$)	Dry filters 10mg/m^3, wet scrubbers 2mg/m^3			Dry filters 10mg/m^3, wet scrubbers 5mg/m^3		
		PM_{10} annual mean ($\mu g/m^3$)	90.4th percentile ($\mu g/m^3$) (short-term PEC)	Short-term PEC > EAL?	PM_{10} annual mean ($\mu g/m^3$)	90.4th percentile ($\mu g/m^3$) (short-term PEC)	Short-term PEC > EAL?
1	50	11.4	11.9	No	11.5	12.4	No
2	50	11.5	12.2	No	11.6	12.8	No
3	50	11.5	12.2	No	11.6	12.8	No
4	50	11.5	12.2	No	11.6	12.8	No
5	50	11.5	12.3	No	11.7	12.9	No
6	50	11.7	12.8	No	11.9	13.4	No
7	50	11.8	13.0	No	12.0	13.6	No
8	50	11.9	13.4	No	12.3	14.8	No
9	50	11.9	13.3	No	12.5	15.4	No
10	50	14.1	20.0	No	14.8	21.5	No
11	50	12.0	13.4	No	12.2	14.1	No
12	50	14.0	19.7	No	14.8	21.9	No

Table 3-8: Comparison of modelled PCs and PECs against EALs - Phases 1 and 2 only- short-term impact

ID	Short-term EAL for PM_{10} ($\mu g/m^3$)	Dry filters 10mg/m^3, wet scrubbers 2mg/m^3			Dry filters 10mg/m^3, wet scrubbers 5mg/m^3		
		PM_{10} annual mean ($\mu g/m^3$)	90.4th percentile ($\mu g/m^3$) (short-term PEC)	Short-term PEC > EAL?	PM_{10} annual mean ($\mu g/m^3$)	90.4th percentile ($\mu g/m^3$) (short-term PEC)	Short-term PEC > EAL?
1	50	11.6	12.7	No	11.8	13.3	No
2	50	11.7	13.1	No	12.0	14.0	No
3	50	11.8	13.2	No	12.0	14.1	No
4	50	11.7	13.1	No	12.0	13.9	No
5	50	11.8	13.4	No	12.1	14.3	No
6	50	12.2	14.6	No	12.5	15.4	No
7	50	12.4	14.9	No	12.7	15.8	No
8	50	12.6	15.9	No	13.3	17.9	No
9	50	12.6	15.3	No	13.4	18.4	No
10	50	18.1	31.1	No	19.0	33.4	No
11	50	12.8	15.7	No	13.1	16.6	No
12	50	18.6	33.5	No	19.8	36.5	No

Table 3-9: Comparison of modelled PCs and PECs against EALs - Phases 1, 2 and 3 - short-term impact

4.0

Conclusion

4.0 Conclusion

This report should be read in conjunction with the Environmental Statement Air Quality, Odour and Dust Technical Paper for the proposed ICT Paper Mill in Flintshire. This report assesses the impact of particulate emissions (PM_{10}) associated with the on-site dust management systems, trimming presses and trimming silos.

Detailed dispersion modelling of the process contributions from the on-site dust emission sources has been carried out and is based on the methodology and process conditions listed in section 2.0 of this report. This includes some conservative assumptions, such as the background concentrations remaining at opening year 2024.

An assessment of PM_{10} emissions associated with Phase 1 and 2 only indicated a negligible impact at all modelled sensitive receptors in the area. The impact of PM_{10} emissions associated with Phase 1 and 2 is therefore not considered to be significant.

An assessment of PM_{10} emissions associated with Phase 1, 2 and 3 indicated a negligible impact at all but two for the modelled sensitive receptors in the area. A slight impact was predicted at modelled receptors 10 and 12, which are located closest to the Proposed Development. Assuming an emission limit of 2mg/m^3 is achievable for the wet scrubbers, which is considered likely based on available data, the maximum percentage change of 7.7% is only slightly higher than the lower threshold for slight impact (6% to 10%). The total concentrations are all well below the annual mean objective (40µg/m^3) and are based on 2024 backgrounds. Background concentrations are anticipated to reduce further by the time Phase 3 becomes operation in 2035. The impact of PM_{10} emissions associated with the operation of Phases 1, 2 and 3 is therefore not considered to be significant.

The 90.4th percentile 24-hour mean PM_{10} is well below 50, even in the worst case operating continuously all year and emitting the highest emission limits. The maximum calculated number of 24-hour mean exceedances (50µg/m^3) not to be exceed more than 35 times in a year is 3.4 which is well below the permissible 35. It is therefore unlikely that the short-term PM_{10} objective would be exceeded at the site.

With reference to the Environment Agency risk assessment, the majority of PCs are also below 1% of the EAL, excluding the PCs for receptors 10 and 12 for Phases 1, 2 and 3, which are slightly above 1% of the EAL (4µg/m^3). However, all of the predicted PECs are well below the EAL (40µg/m^3). The impact of the on-site dust emitting processes on long-term PM_{10} concentrations is therefore considered to be insignificant. All of the predicted short-term PECs are well below the short-term EAL (50µg/m^3), with a maximum of 36.5µg/m^3 predicted at receptor 12 based on all phases operating and wet scrubbers only achieving 5mg/m^3. The impact of the on-site dust emitting processes on short-term PM_{10} concentrations is therefore considered to be insignificant.

It can therefore be concluded that the PM_{10} emissions associated with the operation of the Proposed ICT Paper Mill are not anticipated to have a significant impact on local air quality.

5.0

References

5.0 References

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