awnconsulting

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

T: + 353 1 847 4220
F: + 353 1 847 4257
E: info@awnconsulting.com
W: www.awnconsulting.com

AIR QUALITY & ODOUR IMPACT ASSESSMENT FOR KINGSWOOD TRUCK WASH, OLD NAAS ROAD, KINGSWOOD CROSS, DUBLIN 22

Report Prepared For

Bradawl Limited

Report Prepared By

Ciara Nolan MSc. AMIAQM

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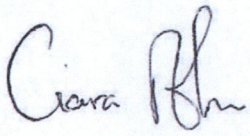
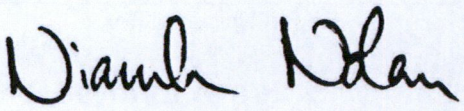
Signature		
Name	Ciara Nolan	Niamh Nolan
Title	Senior Air Quality Consultant	Air Quality Consultant
Date	17 October 2022	17 October 2022

CONTENTS Page

EXECUTIVE SUMMARY

AWN Consulting Ltd. were commissioned to investigate the likely air quality and odour impacts associated with a proposed development at Kingswood Truck Wash, Old Naas Road, Kingswood Cross, Dublin 22. The assessment is in response to Item 2 of the Request for Further Information (RFI) from South Dublin County Council (SDCC) in relation to the planning submission SD22A/0150. Item 2 of the RFI is transcribed below:

2. Air Quality.
The applicant is requested to provide an Air Quality and Odour Assessment which should address the following:
(a) How the development has impacted within the residential area of Brownsbarn Wood, in particular those houses and the public green closest to the development site.
(b) How the development can be altered to reduce any such impact identified under (a).
(c) If applicable, how the development has been designed – or redesigned as the case may be – to ensure no negative impacts on the adjoining residential area.

Impacts to air quality can occur during both the construction and operational phases of the proposed development. With regard to the construction stage the greatest potential for air quality impacts is from fugitive dust emissions impacting nearby sensitive receptors. In terms of the operational stage, impacts to air quality will be as a result of vehicle exhaust emissions, specifically from HGVs, due to an increased number of vehicles accessing the site.

Any potential dust impacts can be mitigated through the use of best practice minimisation measures which are outlined in this report. Dust impacts will be short-term and imperceptible at all nearby sensitive receptors, including those within Brownsbarn Wood. Once works are completed dust levels will return to baseline conditions. Emissions from traffic will have an imperceptible impact on the local air quality. A detailed quantitative air quality assessment of traffic emissions was not required due to the low level changes in traffic predicted as a result of the proposed development. The operational stage will have a long-term, neutral and imperceptible impact on air quality.

There are no significant sources of odour present on site during the operational phase. The wash-water from the proposed truck wash is not predicted to be particularly odorous due to its nature. The water will drain to the below ground foul sewer network and all water will be treated beforehand. Therefore, there is no potential for odour to impact nearby receptors and any impact is considered long-term, neutral and imperceptible.

No significant impacts in relation to air quality and odour are predicted during the construction or operational phases of the proposed development.

1.0 INTRODUCTION

This report assesses the likely air quality and odour impacts associated with a proposed development at Kingswood Truck Wash, Old Naas Road, Kingswood Cross, Dublin 22. The assessment is in response to Item 2 of the Request for Further Information (RFI) from South Dublin County Council (SDCC) in relation to the planning submission SD22A/0150. Item 2 of the RFI is transcribed below:

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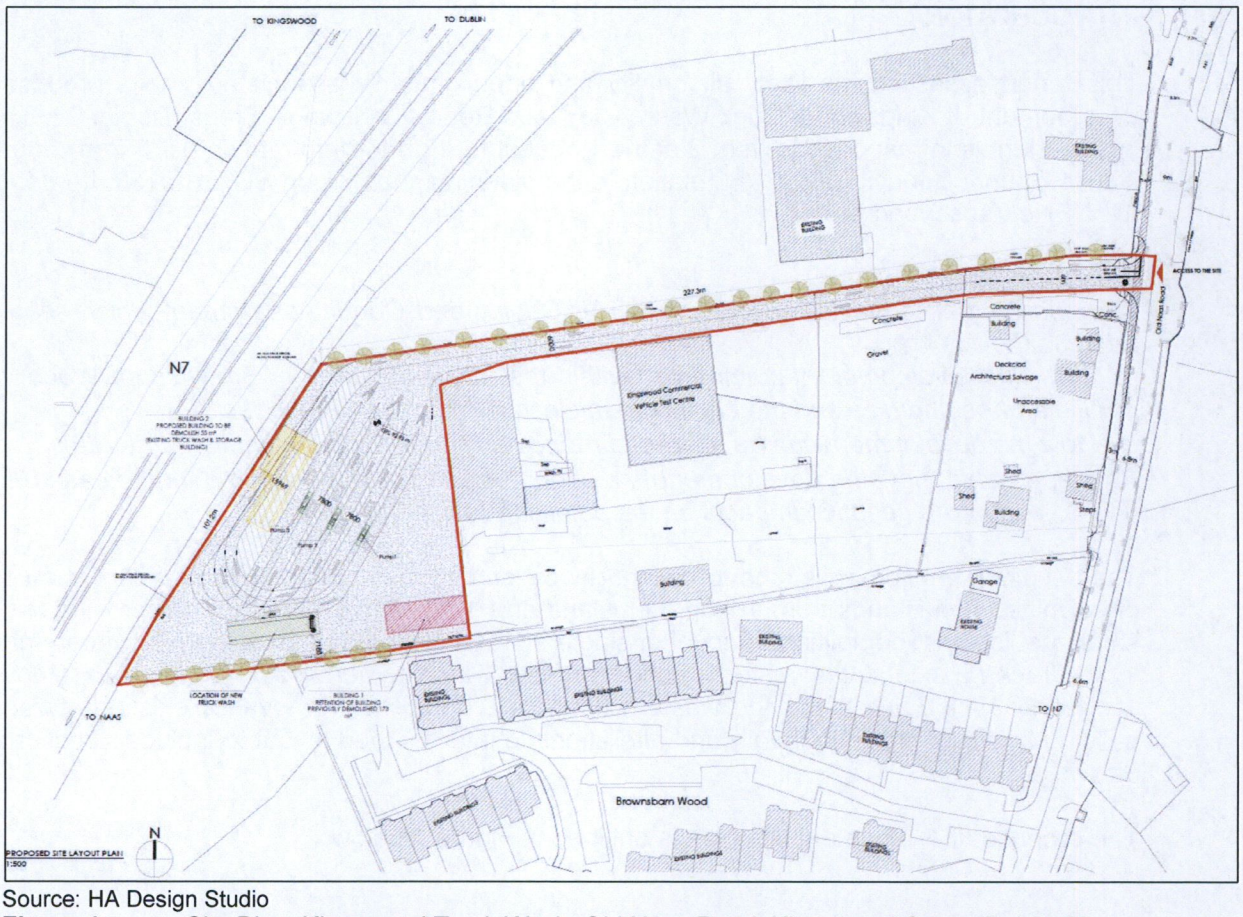
(c) If applicable, how the development has been designed – or redesigned as the case may be – to ensure no negative impacts on the adjoining residential area.

The development comprises the following: relocation of 3 fuel pumps and the reconfiguration of permitted fuel islands from 1 long fuel island and 1 small fuel island to now provide for 3 small fuel islands, demolition/removal of single storey building along southern boundary and 1 new truck wash to south-western boundary of site; Planning permission is sought to remove 1 existing truck wash along the western boundary, demolition/removal of existing storage building to the western boundary and alterations to internal road layout to include directional arrows.

The proposed development site plan is outlined in Figure 1 below.



Source: HA Design Studio

Figure 1 Site Plan, Kingswood Truck Wash, Old Naas Road, Kingswood Cross, Dublin 22

2.0 METHODOLOGY

2.1 Criteria for Rating of Impacts

2.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "*Air Quality Standards*" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2011, which incorporate EU Directive 2008/50/EC, which has set limit values for several pollutants. The limit values in relation to NO_2, PM_{10} and $PM_{2.5}$, are applicable to this assessment (see Table 1).

Pollutant	Regulation Note 1	Limit Type	Value
Nitrogen Dioxide (NO_2)	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m^3
		Annual limit for protection of human health	40 µg/m^3
		Critical level for protection of vegetation	30 µg/m^3 NO + NO_2
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m^3
		Annual limit for protection of human health	40 µg/m^3
Particulate Matter (as $PM_{2.5}$)	2008/50/EC	Annual limit for protection of human health	25 µg/m^3

Note 1 EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

Table 1 Air Quality Standards Regulations

2.1.2 *Dust Deposition Guidelines*

The concern from a health perspective is focussed on particles of dust which are less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$) and the EU ambient air quality standards outlined in Table 1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

With regards to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland. Furthermore, no specific criteria have been stipulated for nuisance dust in respect of this development.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust)[(1)] sets a maximum permissible immission level for dust deposition of 350 mg/(m^2*day) averaged over a one year period at any receptors outside the site boundary. Recommendations from the Department of the Environment, Heritage & Local Government[(2)] apply the TA-Luft limit of 350 mg/(m^2*day) to the site boundary of quarries. This limit value can also be implemented with regard to dust impacts from construction of the proposed development.

2.1.3 *Odour*

The impact to nearby receptors as a result of potential odorous releases depend on the intensity of the odour and the length of time the population may perceive the odour. The Environmental Protection Agency (EPA) have issued guidance in relation to odour assessments entitled "*Odour Emissions Guidance Note (AG9)*"[(3)]. This guidance recommends that odour standards should vary from 1.5 – 6.0 OU_E/m^3 as a 98th%ile of one hour averaging periods at the worst-case sensitive receptor based on the offensiveness of the odour and with adjustments for local factors such as population density. The majority of processes fall into the "*Moderately Offensive*" category i.e. any industrial sector which does not obviously fall within the "most offensive" or "less offensive" categories, this category has an odour threshold of 3.0 OU_E/m^3 as a 98th%ile of one hour averaging periods at the worst-case sensitive receptor. This odour threshold of 3.0 OU_E/m^3 can be applied to the proposed development as the water will be treated prior to discharge and therefore will not be particularly odorous.

2.2 Construction Stage

The Institute of Air Quality Management in the UK (IAQM) guidelines[4] outline an assessment method for predicting the impact of dust emissions from demolition, earthworks, construction and haulage activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of the proposed development in order to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site-specific mitigation required. The use of UK guidance is considered best practice in the absence of applicable Irish guidance.

The major dust generating activities are divided into four types within the IAQM guidance[4] (2014) to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (i.e., the off-site movement of heavy vehicles).

The magnitude of each of the four categories is defined as 'Large', 'Medium' or 'Small' scale, depending on the nature of the activities involved. The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. This allows the level of site specific mitigation to be determined.

Construction phase traffic also has the potential to impact air quality and climate. The UK Highways Agency Design Manual for Roads and Bridges (DMRB) guidance[5], states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment. The use of the UK guidance is recommended by Transport Infrastructure Ireland (TII)[6] in the absence of specific Irish guidance, this approach is considered best practice and can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more.
- Heavy duty vehicle (HDV) AADT changes by 200 or more.
- A change in speed band.
- A change in carriageway alignment by 5m or greater.

The construction traffic associated with the proposed development was reviewed and it was determined that it will not increase the AADT or HDV by an amount greater than the screening criteria above. Therefore, a detailed air quality assessment has been screened out as there is no potential for significant impacts to air quality as a result of construction traffic emissions.

2.3 Operational Stage

Operational phase traffic has the potential to impact local air quality as a result of increased vehicle movements associated with the proposed development. The UK Highways Agency DMRB scoping criteria detailed in Section 2.2 was used to determine if any road links are affected by the proposed development and require inclusion in a detailed air dispersion modelling assessment. There will be an increase in the number of HGVs accessing the site once the proposed development is operational, however, it is not predicted that there would be over 200 HGVs accessing the site per day, in addition, due to the nature of the development there is not predicted to be an increase in the number of passenger cars accessing the site. As such, the proposed development is not predicted to significantly change the existing traffic on the nearby road links and any change will be less than 1,000 AADT or 200 HDV AADT. Therefore, according to the DMRB scoping criteria in Section 2.2 none of the local road links

can be classed as 'affected' and detailed air dispersion modelling of operational phase traffic emissions is not required as there is no potential for significant impacts to air quality.

There are no significant sources of odour present on site during the operational phase. The wash-water from the proposed truck wash is not predicted to be particularly odorous due to its nature. The water will drain to the below ground foul sewer network. There will be 2 no. full retention forecourt separators which will treat all discharge water before it flows by gravity to the existing foul sewer pump chamber to the west of the site. The separators will be vented in accordance with Regulation 36 of The Dangerous Substances (Retail & Private Petroleum Stores) Regulations, 1979. From here it will be pumped out to the existing 600 mm diameter gravity sewer located in the Old Naas Road. No wash-water will collect on site and good housekeeping practices will be implemented across the site to ensure a high level of cleanliness is maintained. Therefore, there is no potential for odour to impact nearby receptors and a detailed assessment is not required.

3.0 BASELINE ENVIRONMENT

3.1 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels)[7]. Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ - PM_{10}) will actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Casement Aerodrome meteorological station, which is located approximately 1.5 km west of the site. Casement Aerodrome met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 2). For data collated during five representative years (2017 – 2021), the predominant wind direction is westerly to south-westerly with a mean wind speed of 5.5 m/s over the period 1981 – 2010[8].

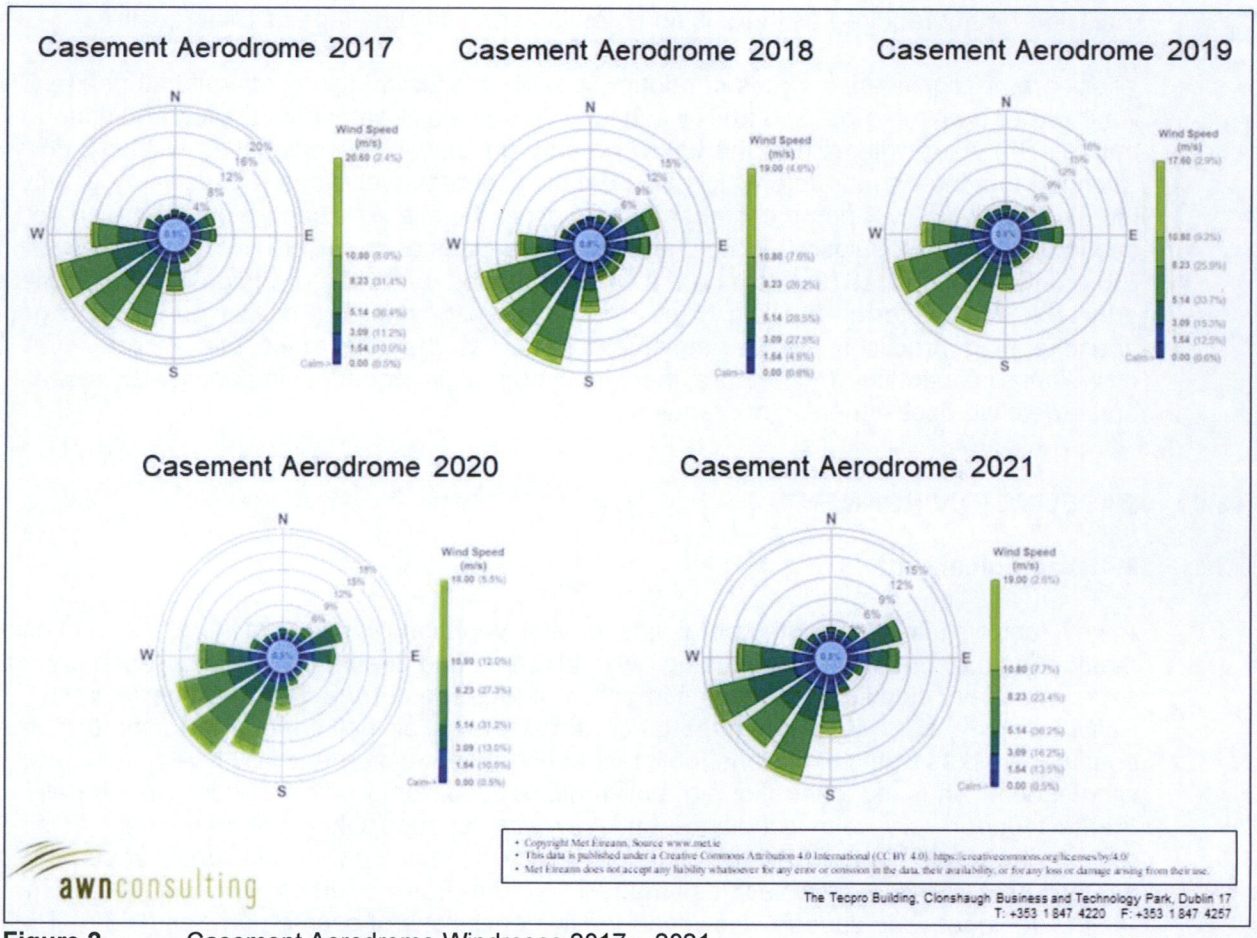


Figure 2 Casement Aerodrome Windroses 2017 – 2021

3.2 Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality in Ireland is "*Air Quality In Ireland 2021*"[9]. The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments[10].

As part of the implementation of the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), four air quality zones have been defined in Ireland for air quality management and assessment purposes[9]. Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D.

In terms of air monitoring and assessment, the proposed development in Kingswood is within Zone A[10]. Long-term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.).

In 2020 the EPA reported that Ireland was compliant with EU legal air quality limits at all locations, however this was largely due to the reduction in traffic due to Covid-19

restrictions. The EPA *Air Quality in Ireland 2021*[9] report details the effect that the Covid-19 restrictions had on air monitoring stations, which included reductions of up to 50% at some monitoring stations which have traffic as a dominant source. The report also notes that CSO figures show that while traffic volumes are still slightly below 2019 levels, they have significantly increased since 2020 levels. 2020 concentrations are therefore predicted to be an exceptional year and not consistent with long-term trends. For this reason, they have not been included in determining the baseline and previous long-term data has been used to determine baseline levels of pollutants in the vicinity of the proposed development.

Long-term NO_2 monitoring was carried out at the Zone A suburban locations of Rathmines, Ballyfermot, Dun Laoghaire and Swords for the period 2017 – 2021[9]. Long term average concentrations are significantly below the annual average limit of 40 µg/m^3 for these suburban locations. Average results range from 13 – 22 µg/m^3. The NO_2 annual average for this five year period suggests an upper average limit of no more than 22 µg/m^3 (Table 2) as a background concentration for the suburban locations. Based on the above information and having regard to the proposed development's location further from the city centre, a conservative estimate of the current background NO_2 concentration for the region of the proposed development is 20 µg/m^3.

Station	Station Classification	Averaging Period Note 1,2	Year				
			2017	2018	2019	2020	2021
Rathmines	Suburban Background	Annual Mean NO_2 (µg/m^3)	17	20	22	13	14
		99.8th%ile 1-hr NO_2 (µg/m^3)	86	87	102	170	143
Ballyfermot	Suburban Background	Annual Mean NO_2 (µg/m^3)	17	17	20	14	16
		99.8th%ile 1-hr NO_2 (µg/m^3)	112	101	101	92	93
Dun Laoghaire	Suburban Background	Annual Mean NO_2 (µg/m^3)	17	19	15	11	11
		99.8th%ile 1-hr NO_2 (µg/m^3)	101	91	91	84	79
Swords	Suburban Background	Annual Mean NO_2 (µg/m^3)	14	16	15	12	13
		99.8th%ile 1-hr NO_2 (µg/m^3)	79	85	80	108	90

Note 1 Annual average limit value – 40 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Note 2 1-hour limit value – 200 µg/m^3 as a 99.8th%ile, i.e. not to be exceeded >18 times per year (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Table 2 Trends In Zone A Air Quality – Nitrogen Dioxide (NO_2)

Continuous PM_{10} monitoring was carried out at the Zone A locations of Rathmines, Dun Laoghaire, Ballyfermot and Phoenix Park from 2017 – 2021[9]. These showed an upper average limit of no more than 16 µg/m^3 (Table 3). Levels range from 9 – 16 µg/m^3 over the five year period with at most 9 exceedances of the 24-hour limit value of 50 µg/m^3 in Rathmines and in 2019 (35 exceedances are permitted per year)[9]. Based on the EPA data, a conservative estimate of the current background PM_{10} concentration in the region of the proposed development is 15 µg/m^3.

Station	Station Classification	Averaging Period Note 1, 2	Year				
			2017	2018	2019	2020	2021
Ballyfermot	Suburban Background	Annual Mean PM_{10} ($\mu g/m^3$)	12	16	14	12	12
		24-hr Mean > 50 $\mu g/m^3$ (days)	1	0	7	2	0
Dún Laoghaire	Suburban Background	Annual Mean PM_{10} ($\mu g/m^3$)	12	13	12	12	11
		24-hr Mean > 50 $\mu g/m^3$ (days)	2	0	2	0	0
Rathmines	Suburban Background	Annual Mean PM_{10} ($\mu g/m^3$)	13	15	15	10	10
		24-hr Mean > 50 $\mu g/m^3$ (days)	5	2	9	0	0
Phoenix Park	Urban Background	Annual Mean PM_{10} ($\mu g/m^3$)	9	11	11	11	12
		24-hr Mean > 50 $\mu g/m^3$ (days)	1	0	2	2	0

Note1 Annual average limit value – 40 $\mu g/m^3$ (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).
Note 2 24-hour limit value – 50 $\mu g/m^3$ as a 90.4th%ile, i.e. not to be exceeded >35 times per year (EU Council Directive 1999/30/EC & S.I. No. 180 of 2011).
Table 3 Trends In Trends In Zone A Air Quality – PM_{10}

Monitoring of both PM_{10} and $PM_{2.5}$ takes place at the station in Rathmines which allows for the $PM_{2.5}/PM_{10}$ ratio to be calculated. Average $PM_{2.5}$ levels in Rathmines over the period 2017 – 2021 ranged from 9 – 10 $\mu g/m^3$, with a $PM_{2.5}/PM_{10}$ ratio ranging from 0.60 – 0.75[9]. Based on this information, a conservative ratio of 0.8 was used to generate an existing $PM_{2.5}$ concentration in the region of the development of 12 $\mu g/m^3$.

Based on the above information the air quality in the suburban Dublin area is generally good, with concentrations of the key pollutants generally well below the relevant limit values. However, the EPA have indicated that road transport emissions are contributing to increased levels of NO_2 with the potential for breaches in the annual NO_2 limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM_{10} and $PM_{2.5}$). The EPA predict that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues[9].

3.3 Sensitivity of the Receiving Environment

In line with the IAQM guidance document[4] prior to assessing the impact of dust from a proposed development the sensitivity of the area must first be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time. Commercial properties and places of work are regarded as medium sensitivity while low sensitivty receptors are places where people are present for short periods or do not expecet a high level of amenity.

In terms of receptor sensitivity to dust soiling there are a number of high sensitivty properties (residential dwellings) in Brownsbarn Wood to the direct south of the proposed development; there are also 2 no. sports clubs and playing pitches to the east of the site along the Old Naas Road (see Figure 3). There are 5 no. residential properties within Brownsbarn Wood that are within 0m – 20m of the site boundary; and there are 12 no. properties that are within 20m – 50m of the site boundary. Based on the IAQM criteria outlined in Table 4, the worst case sensitivity of the area to dust soiling is considered medium.

Receptor Sensitivity	Number Of Receptors	Distance from 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 4 Sensitivity of the Area to Dust Soiling Effects on People and Property

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM_{10} concentration, receptor sensitivity based on type and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM_{10} concentration in the vicinity of the proposed development is 15 $\mu g/m^3$ and there are approximately 5 no. residential properties to the direct south of the site within 0m – 20m of the proposed works. Based on the criteria in Table 5 below, the sensitivtiy of the area to human health impacts is considered low.

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

Table 5 Sensitivity of the Area to Human Health Impacts

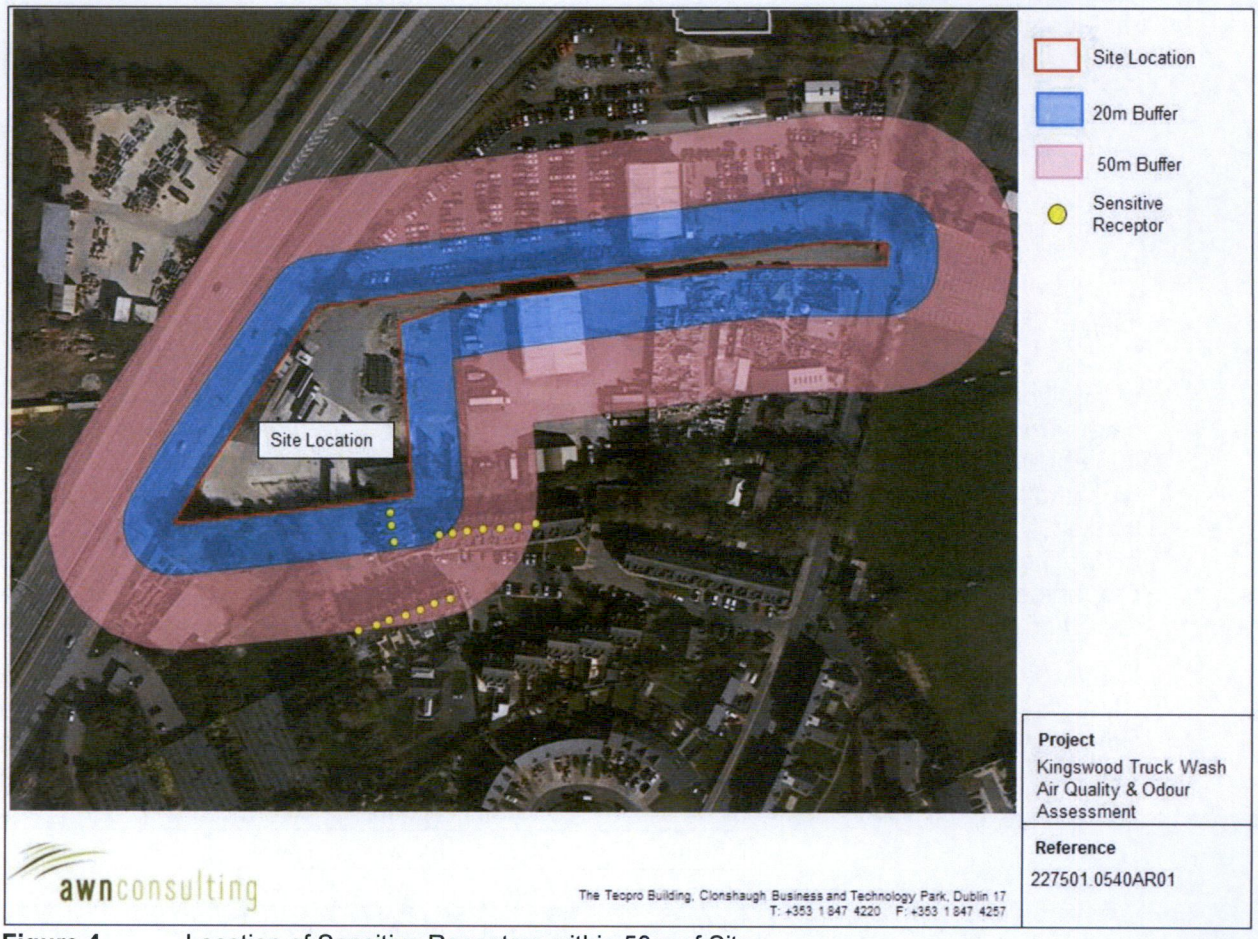


Figure 4 Location of Sensitive Receptors within 50m of Site

4.0 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development involves the construction of a truck wash and associated site works as described in Section 1.0. Impacts to air quality can occur during both the construction and operational stages of the proposed development.

During the construction phase of the development construction dust impacts are the primary source of air quality related impacts. In addition, vehicle exhaust emissions during construction and operation have the potential to impact air quality. Odour emissions in relation to the wash-water from the proposed truck wash are not envisioned during the operational phase due to the nature of the water. The following describes the primary sources of potential air quality and odour impacts which have been assessed as part of this report.

5.0 PREDICTED IMPACTS

5.1 Construction Phase

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 350m of a construction site, the majority of the deposition occurs within the first 50m. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local

meteorological factors such as rainfall, wind speed and wind direction. A review of Casement Aerodrome meteorological data (see Section 3.1) indicates that the prevailing wind direction is westerly to south-westerly and wind speeds are generally moderate in nature. In addition, dust generation is considered negligible on days where rainfall is greater than 0.2 mm. A review of historical 30 year average data for Casement Aerodrome indicates that on average 183 days per year have rainfall over 0.2 mm[8] and therefore it can be determined that over 50% of the time dust generation will be reduced.

In order to determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (see Section 3.3). The major dust generating activities are divided into four types within the IAQM guidance to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (movement of heavy vehicles).

Demolition

Demolition will primarily involve the removal of buildings or structures currently on the site in a potentially dusty manner. This may also involve dust generation at heights. Dust emission magnitude from demolition can be classified as small, medium and large and are described below:

- **Large**: Total building volume >50,000m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20m above ground level.

- **Medium**: Total building volume 20,000m^3 – 50,000m^3, potentially dusty construction material, demolition activities 10 – 20m above ground level.

- **Small**: Total building volume less than 20,000m^3.

The are some demolition works proposed for the site with the removal of the existing truck wash and a single storey building, however, the total building volume to be demolished will be less than 20,000 m^3. Therefore, the demolition works can be categorised as small under the IAQM guidance.

As the overall sensitivity of the area to dust soiling impacts is medium there is a low risk of dust soiling impacts from the proposed demolition activities according to the IAQM guidance (see Table 6). There is a negligible risk of dust-related human health impacts as a result of the demolition activities as the overall sensitivity of the area to human health impacts is low (Section 3.3).

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	**Low Risk**
Low	Medium Risk	Low Risk	**Negligible**

Table 6 Risk of Dust Impacts – Demolition

Earthworks

Earthworks primarily involve excavating material, loading and unloading of materials, tipping and stockpiling activities. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** Total site area > 10,000 m^2, potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds > 8 m in height, total material moved >100,000 tonnes;

- **Medium:** Total site area 2,500 m^2 – 10,000 m^2, moderately dusty soil type (e.g. silt), 5 - 10 heavy earth moving vehicles 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^2, soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 4 m in height, total material moved < 20,000 tonnes, earthworks during wetter months.

The dust emission magnitude for the proposed earthwork activities can be classified as small as the total material moved (both excavations and infilling works) will be less than 20,000 tonnes and there will be no requirement for bunds over 4 m in height to be formed. As outlined in Table 7, taking into account the overall sensitivity of the area as determined in Section 3.3, this results in an overall low risk of dust soiling impacts and a negligible risk of human health impacts as a result of the proposed earthworks activities.

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	**Low Risk**
Low	Low Risk	Low Risk	**Negligible**

Table 7 Risk of Dust Impacts – Earthworks

Construction

Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** Total building volume > 100,000 m^3, on-site concrete batching, sandblasting;

- **Medium:** Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), on-site concrete batching;

- **Small:** Total building volume < 25,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

There are no significant buildings proposed as part of the development; construction is limited to a truck wash and the relocation and alteration of fuel pumps and fuel islands. The dust emission magnitude for the proposed construction activities can be classified as small as the total building volume to be constructed will be significantly less than 25,000 m^3. As outlined in

Table 8, this results in an overall low risk of dust soiling impacts and a negligible risk of human health impacts as a result of the proposed construction activities.

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	**Low Risk**
Low	Low Risk	Low Risk	**Negligible**

Table 8 Risk of Dust Impacts – Construction

Trackout

Factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from trackout can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100 m;
- **Medium:** 10 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 - 100 m;
- **Small:** < 10 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.

The dust emission magnitude for the proposed trackout activities can be classified as small as all roads are paved therefore there is a low potential for dust release. As outlined in Table 9, this results in an overall low risk of dust soiling impacts and a negligible risk of human health impacts as a result of the proposed trackout activities.

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	**Low Risk**
Low	Low Risk	Low Risk	**Negligible**

Table 9 Risk of Dust Impacts – Trackout

Summary of Dust Emission Risk

The risk of dust impacts as a result of the proposed development are summarised in Table 10 for each activity. The magnitude of risk determined is used to prescribe the level of site specific mitigation required for each activity in order to prevent significant impacts occurring.

There is at most a low risk of dust soiling impacts and a negligible risk of human health impacts associated with the proposed works. Best practice dust mitigation measures will be implemented to ensure there are no significant impacts at nearby sensitive receptors.

Potential Impact	Dust Emission Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Emission Magnitude	Small	Small	Small	Small
Dust Soiling Risk	Low Risk	Low Risk	Low Risk	Low Risk
Human Health Risk	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk

Table 10 Summary of Dust Impact Risk used to Define Site-Specific Mitigation

5.2 Operational Phase

Operational phase traffic has the potential to impact local air quality as a result of increased vehicle movements associated with the proposed development. However, the operational phase traffic was reviewed and it was determined that the proposed development is not predicted to significantly change the existing traffic on the nearby road links. While the proposed development will result in an increased number of HGVs accessing the site, it is not envisioned that there will be greater than 200 HGVs accessing the site per day. Therefore, according to the DMRB scoping criteria in Section 2.2 none of the local road links can be classed as 'affected'. The potential impact to air quality during the operational phase is considered long-term, neutral and imperceptible.

There are no significant sources of odour present on site during the operational phase. The wash-water from the proposed truck wash is not predicted to be particularly odorous due to its nature. The water will drain to the below ground foul sewer network and all water will be treated beforehand. Therefore, there is no potential for odour to impact nearby receptors and any impact is considered long-term, neutral and imperceptible.

6.0 MITIGATION MEASURES

There is a low risk of dust soiling impacts associated with the construction phase of the proposed development. Standard best practice dust minimisation measures shall be implemented on site to ensure no significant dust impacts occur at nearby sensitive receptors. The measures to be implemented are outlined below.

Site Management

- The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised;
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details;
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out;
- It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein;
- At all times, the procedures put in place will be strictly monitored and assessed.

Site Roads / Public Roads

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles;

- The access road to the site shall be swept to remove mud and aggregate materials from the surface;
- Public roads outside the site (Old Naas Road) shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary;
- Vehicles delivering or collecting material with potential for dust emissions shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust.

Land Clearing / Earth Moving

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust;
- During periods of very high winds (gales), activities likely to generate significant dust emissions should be postponed until the gale has subsided.

Storage Piles

- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site. Where possible storage piles should be located downwind of sensitive receptors;
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust. The regular watering of stockpiles has been found to have an 80% control efficiency[11];
- Where feasible, hoarding will be erected around site boundaries to reduce visual impact. This will also have an added benefit of preventing larger particles from impacting on nearby sensitive receptors.

Summary of Dust Mitigation Measures

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the contractor. The key features with respect to control of dust will be:

- The specification of a site policy on dust and the identification of the site management responsibilities for dust issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust minimisation plan can be regularly monitored and assessed; and
- The specification of effective measures to deal with any complaints received.

6.2 Operational Phase

Operational phase impacts are predicted to be imperceptible therefore no mitigation is proposed.

7.0 CONCLUSIONS

No significant impacts to air quality are predicted during the construction or operational phases of the proposed development. Specifically, it has been determined that the proposed development with not result in any significant impacts in relation to air quality or odour at the

residential area of Brownsbarn Wood or the nearby public green areas. Once the dust minimisation measures outlined in Section 6.1 are implemented, fugitive emissions of dust from the site during construction will be insignificant and pose no nuisance to nearby receptors.

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