

13 AIR QUALITY AND CLIMATE

13.1 Introduction

The impact assessment for air quality and climate was prepared by AONA Environmental Consulting Limited to assess the potential air quality and dust deposition impact at each area of the proposed River Poddle Flood Alleviation Scheme on the nearest sensitive receivers. The construction activities have been examined to identify those that have the potential to give rise to dust and air pollutant emissions. Where appropriate, mitigation measures have been outlined.

The assessment and evaluation of the potential air quality and dust impact arising from the proposed development involved the following:

- Review of ambient air quality in the vicinity of the proposed River Poddle Flood Alleviation Scheme using available reference data available from the EPA.
- Identification of potential air quality and dust emissions released from the construction of the proposed River Poddle Flood Alleviation Scheme.
- A recommendation of appropriate construction mitigation measures.
- The operation of the proposed development will not result in air quality and/or dust deposition impacts.

13.2 Statement of Authority

The Air Quality & Climate Impact Assessment has been prepared by Mervyn Keegan. Mervyn Keegan is a Director of the environmental consultancy, AONA Environmental Consulting Ltd. Mervyn Keegan's areas of professional expertise are in Noise Control & Acoustics and Air Quality & Odour consultancy, including Air Quality & Climate impact assessment and mitigation design. Mervyn Keegan has over 20 years of environmental consultancy experience. Mervyn is a full member of the Institute of Acoustics, with a Bachelor of Science Degree (Applied Sciences), a Master of Science Degree (Environmental Science) and a Diploma in Acoustics in Noise Control. AONA Environmental Consulting Ltd. is an independent consultancy specialising in Environmental Impact Assessment and Licensing. Mervyn Keegan (AONA Environmental Consulting Ltd.) has prepared numerous Air Quality & Climate impact assessments per annum for a wide range of development types in the Republic of Ireland, Northern Ireland and the UK in the last 15 years. Mervyn Keegan is an expert in the awareness and understanding of the relevant legislation and guidance that pertains to best practise in such assessments. Mervyn Keegan has appeared as an Expert Witness at oral hearings, public inquiries and legal proceedings. Mervyn Keegan has produced Air Quality & Climate Impact Assessment reports to assess the impacts of a range of development types including roads, residential developments, industrial developments, quarries and mines and wind energy developments among others.

13.3 Methodology

13.3.1 Air Quality Standards Regulations

In order to protect our health, vegetation and ecosystems, EU directives set down air quality standards in Ireland and the other member states for a wide variety of pollutants. These rules include how we should monitor, assess and manage ambient air quality. **Tables 13-1 to 13-6** set out the limit values or target values specified by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) & CAFE Directive 2008/50/EC.

Table 13-1: Limit Values

Pollutant	Limit Value Objective	Averaging Period	Limit Value	Basis of Application of the Limit Value	Limit Value Attainment Date
SO₂	Protection of human health	1 hour	350	Not to be exceeded more than 24 times in a calendar year	1 Jan 2005
	Protection of human health	24 hours	125	Not to be exceeded more than 3 times a calendar year	1 Jan 2005
	Protection of vegetation	calendar year	20	Annual mean	19 July 2001
	Protection of vegetation	1 Oct to 31 Mar	20	Winter mean	19 July 2001
NO₂	Protection of human health	1 hour	200	Not to be exceeded more than 18 times a calendar year	1 Jan 2010
	Protection of human health	calendar year	40	Annual mean	1 Jan 2010
NO_x	Protection of ecosystems	calendar year	30	Annual mean	19 July 2001
PM₁₀	Protection of human health	24 hours	50	Not to be exceeded more than 35 times a calendar year	1 Jan 2005
	Protection of human health	calendar year	40	Annual mean	1 Jan 2005
PM_{2.5} - Stage 1	Protection of human health	calendar year	25	Annual mean	1 Jan 2015
PM_{2.5} - Stage 2	Protection of human health	calendar year	20	Annual mean	1 Jan 2020
Lead	Protection of human health	calendar year	0.5	Annual mean	1 Jan 2005
Carbon Monoxide	Protection of human health	8 hours	10,000	Not to be exceeded	1 Jan 2005
Benzene	Protection of human health	calendar year	5	Annual mean	1 Jan 2010

Table 13-2: Alert Thresholds for Sulphur Dioxide & Nitrogen Dioxide.

Pollutant	Averaging Period	Limit Value
Sulphur Dioxide	1 hour	500 µg/m ³
Nitrogen Dioxide	1 hour	400 µg/m ³

Note: The public must be informed if the following thresholds are exceeded for three consecutive hours.

Table 13-3: Target Values of Directive 2004/107/EC

Pollutant	Limit Objective	Value	Averaging Period	Limit Value ng/m ³	Limit Attainment Date
Arsenic	Protection human health	of	calendar year	6	31 Dec 2012
Cadmium	Protection human health	of	calendar year	5	31 Dec 2012
Nickel	Protection human health	of	calendar year	20	31 Dec 2012
Benzo pyrene	(a) Protection human health	of	calendar year	1	31 Dec 2012

13.3.2 Target Values and Long-Term Objectives of CAFE Directive 2008/50/EC

The ozone daughter directive is different from the previous two in that it sets target values and long-term objectives for ozone levels rather than limit values. They are as follows:

Table 13-4: Target Values for Ozone from 2010

Objective	Parameter	Value
Protection of human health	Maximum daily 8 hour mean	120 µg/m ³ not to be exceeded more than 25 days per calendar year averaged over 3 years
Protection of vegetation	AOT 40 calculated from 1 hour values from May to July	18000 µg/m ³ -h averaged over 5 years

Table 13-5: Long Term Objectives for Ozone from 2020

Objective	Parameter	Value
Protection of human health	Maximum daily 8 hour mean	120 µg/m ³
Protection of vegetation	AOT40 calculated from 1 hour values from May to July	6000 µg/m ³ -h

Table 13-6: Information and Alert Thresholds for Ozone

Objective	Parameter	Threshold
Information Threshold	1 hour average	180 µg/m ³
Alert Threshold	1 hour average	240 µg/m ³

Note: The public must be informed if ozone levels exceed the following thresholds

13.3.3 Dust Deposition Limits

There are many types of particulate matter (PM) that are included in the definition of dust, including variations in terms of size and chemical composition. A basic classification of particles may be made into those that are easily deposited and those that remain suspended in the air for long periods. This division is useful as deposited dust is usually the coarse fraction of particulates that causes dust annoyance, whereas suspended particulate matter is implicated more in exposure impacts.

Airborne particles have a large range of diameters, from nano-particles and ultrafine particles (diameters less than 0.1µm) to the very large particles with diameters up towards 100µm. There is no clear dividing line between the sizes of suspended particulates and deposited particulates, although particles with diameters >50 µm tend to be deposited quickly and particles of diameter <10 µm have an extremely low deposition rate in comparison. Therefore, the size of suspended and deposited dust particles affects their distribution and as such requires two very different approaches to sampling these fractions. Large dust particles, (greater than 30µm), which make up the greatest proportion of dust emitted from mineral workings, will largely deposit within 100m of source. Intermediate-sized particles (10 to 30µm) are likely to travel 200 to 500m. Smaller particles (less than 10µm) which make up a small proportion of the dust emitted from most mineral workings are only deposited slowly but may travel 1000m or more. Concentrations decrease rapidly on moving away from the source, due to dispersion and dilution. Smaller particles, particularly those <10 µm in diameter, have a greater potential to have their settling rate impeded by atmospheric turbulence and to be transported further from their source. Dust emissions are exacerbated by dry weather and high wind speeds. The impact of dust therefore, also depends on the wind direction and the relative location of the dust source and receiver.

PM₁₀ is the fraction of airborne (suspended) PM which contains particles of diameter less than 10µm. PM₁₀ includes all particles, of different sizes and types, which are relevant for potential health effects. PM₁₀ can penetrate deep into the respiratory system increasing the risk of respiratory and cardiovascular disorders. Relevant limit values for PM₁₀ are outlined in the CAFE Directive 2008/50/EC.

There are no Irish or EU air quality standards with which levels of dust deposition can be compared. However, a figure of 350 mg/m²/day (measured using Bergerhoff type dust deposit gauges as per German Standard Method for determination of dust deposition rate, VDI 2119) is commonly applied to ensure that no nuisance effects will occur. This guideline limit value of 350 mg/m²/day is obtained from the commonly applied *German TA Luft Air Quality Standard* immission limit value which was established to protect significant nuisance or significant disadvantage due to dustfall (deposition). This use of this limit value is generally considered appropriate by both Local Authorities and the EPA (see

previously referenced guidance) to minimise the impact of airborne dust levels on the receiving environment beyond site boundaries. The German TA Luft criteria for 'possible nuisance' and 'very likely nuisance' are 350mg/m²/day and 650mg/m²/day, respectively. The German TA Luft Air Quality Standard also specifies immission limit values for certain trace metals and their inorganic compounds.

13.4 Existing Environment

The EPA has divided the country into zones for the assessment and management of air quality. The zones adopted in Ireland are Zone A, the Dublin conurbation; Zone B, the Cork conurbation; Zone C, comprising 21 large towns in Ireland with a population >15,000; and Zone D, the remaining area of Ireland. The site is located in 'Zone A' as denoted by the EPA.

Nitrogen oxides (NO_x, NO and NO₂) and Particulate (PM₁₀) background concentrations in 2015, 2016 and 2017 have been referenced from the Rathmines EPA air quality monitoring station. Particulate Matter (PM₁₀) background concentrations in 2015, 2016 and 2017 have been referenced from the Tallaght EPA air quality monitoring station.

Both of these air quality monitoring stations are located in proximity to the River Poddle and provide an accurate representation of air quality in the area of the River Poddle Flood Alleviation Scheme.

Based on the reported nitrogen oxides (NO_x, NO and NO₂) and particulate (PM₁₀) background concentrations from the Rathmines and Tallaght EPA air quality monitoring stations, the background air quality in the area of the proposed development is of good quality. As shown **Tables 13-7** and **13-8**, the reported annual mean NO₂ and particulate (PM₁₀) concentrations at Rathmines and Tallaght are less than 50% of the relevant ambient air quality limit value.

Table 13-7: Rathmines EPA Air Quality monitoring station data (µg/m³)

Year	Annual Mean Concentration (µg/m ³)			
	NO _x	NO	NO ₂	PM ₁₀
2015	27.7	6.2	18.3	15.33
2016	31.14	7.33	19.95	14.76
2017	26.75	6.31	17.10	13.4
Limit Value	30 µg/m ³	-	40 µg/m ³	40 µg/m ³

Table 13-8: Tallaght EPA Air Quality monitoring station data (µg/m³)

Year	Concentration (µg/m ³) PM ₁₀
2015	14.11
2016	14.1
2017	11.8
Limit Value	40 µg/m ³

13.5 Air Quality & Dust Impact Assessment

13.5.1 Construction Dust Impact at Sensitive Receivers

The construction works along the proposed the River Poddle Flood Alleviation Scheme have the potential to generate dust.

Dust becomes airborne due to the action of wind on material stockpiles and other dusty surfaces, or when thrown up by mechanical action, for example the movement of tyres on a dusty haul road or activities such as site clearance, excavation, infilling, etc. Dust emissions can arise as a result of operational activities, and /or wind erosion of exposed surfaces. The amount of dust that is raised is highly dependent upon a number of interrelated factors, which include:

- The nature of the material and activities being undertaken;
- The duration of each activity,
- The particular items of plant in use,
- The prevailing weather conditions in terms of rainfall and wind direction and strength,
- The influence of any on site mitigation measures.

Dust is generally perceived as being a nuisance when a deposit accumulates on a surface. However, the level at which soiling becomes a nuisance is highly subjective. Whether or not a nuisance exists is determined, in the first instance, by the professional judgement of a Local Authority Environmental Health Officer. In order to aid this judgement, the mean rates of dust deposition, based upon gravimetric values, are used to indicate any potential nuisance impact.

13.5.2 Predicted Construction Phase Impacts at Sensitive Receivers

All practical measures will be taken to ensure that the dust emissions associated with the proposed River Poddle Flood Alleviation Scheme do not cause an unacceptable significant adverse impact upon local residents and road users or in the case of Tymon North and Tymon Park, upon Park users.

Soil stripping is required to create the main site compound off Limekiln Road, and to prepare haul roads through the works areas in Tymon North and Tymon Park. Excavations, and infilling of clay materials will be required to create the embankments in Tymon North and Tymon Park, and excavations are required for the Integrated Constructed Wetlands (ICW). Works on the flood defence walls and manhole chambers will entail some excavations and tree removal, with removal of existing walls in some locations. All of these works have the potential for dust generation.

Construction of the flood defence walls will in some places be approximately 20m from the nearest sensitive receivers. Construction works for the embankments and ICW in Tymon North and Tymon Park will be significantly further away from the closest receivers. Although construction activity will be of limited duration, it will require implementation of the recommended dust mitigation measures. The potential for dust nuisance impact during construction would be limited to the immediate vicinity of the activities, even without dust

suppression measures in operation, because of the predominantly coarse and expected wet nature of the excavated materials.

The movement of earth will be the most significant potential source of dust generation. Excavated material and imported clay materials will be transported by dump trucks to the various locations at which embankment construction will be required in Tymon North and Tymon Park. Recommendations regarding mitigation for haul roads, vehicles and mobile plant are outlined below.

Un-cleaned vehicles leaving the site also have the potential to deposit mud and dirt along the public roads. This has the potential to generate fugitive dust which will be mitigated by containment and / or wet suppression in close proximity to the works areas and the site compound. There is the potential for roadways, stockpiles and other un-vegetated surfaces to produce dust emissions during dry, windy conditions. Stockpiles and haul roads would require mitigation measures as outlined below.

The areas of proposed construction works and whether these have the potential to result in a construction dust impact and require construction mitigation measures are summarised in **Table 13-9**.

Emissions from construction plant and equipment will be short-term and insignificant.

Table 13-9: Areas of proposed construction works and whether these are likely to result in a construction noise impact and require construction mitigation measures

Drawing No.	Location	Scheduled Works	Comments	Location of Nearest Sensitive Receivers	Potential Dust Impacts?
08132	Tymon North	Left bank embankment	<ul style="list-style-type: none"> Tree removal, temporary access road, excavating & saving topsoil, importing material, temporary crossing of river, piling, landscape mitigation works. 	St. Aongus Crescent – ~130m to SW	No.
08133	Tymon North (adj to ESB substation)	Left bank embankment	<ul style="list-style-type: none"> Tree removal, temporary access road, excavating & saving topsoil, importing material, piling, landscape mitigation works 	St. Aongus Grove – ~190m to SW	No.
08140	Tymon Park	Main site compound	<ul style="list-style-type: none"> Access off Limekiln Road Offices, carpark spaces, storage units Welfare facilities Water ESB and foul Temporary stockpile location in this area Pedestrian access management to prevent access to works area. 	Limekiln Road – ~25m to N.	Yes.
08140	Tymon North and Tymon Park	Material stockpiling and landscape restoration & mitigation.	<ul style="list-style-type: none"> The aim is to reuse excavated material in landscape mitigation and restoration. Topsoil excavated from the works areas (first 200mm depth) in Tymon North and Tymon Park will be reserved on site for reuse in final landscape mitigation and restoration. 	St. Aongus Crescent, St. Aongus Grove & Limekiln Road.	Yes.
08141	Tymon Park	Left bank embankment	<ul style="list-style-type: none"> Tree removal, temporary access roads, excavating & saving topsoil, importing material, piling, landscape mitigation works 	Limekiln Road – ~150m to N.	No.

Drawing No.	Location	Scheduled Works	Comments	Location of Nearest Sensitive Receivers	Potential Dust Impacts?
08142	Tymon Park	Left bank embankment	<ul style="list-style-type: none"> Tree removal, temporary access roads, excavating & saving topsoil, importing material, piling, landscape mitigation works 	Limekiln Road – ~100m to N.	No.
08143	Tymon Lake	Main flood storage embankment and flow control structure	<ul style="list-style-type: none"> Tree removal, excavating & saving topsoil, importing material, temporary diversion, removal of existing weir and footbridge, temporary crossing of river, temporary access roads, piling, landscape mitigation works. For the embankment: Excavated top soil at foot of embankment and store for re use; Excavate central core; Fill with embankment material compacting in layers (consider use of remote control roller); construct embankment in 300mm layers, compact using 14T single drum vibrating roller; Surface of completed layer to be toothed with bucket to bond to next layer; Repeat; Embankment is overfilled and shaped to correct size and slope geometry. For flow control structure: Necessary to install channel diversion to dry out works area; fill in area of lake for works access; Design of structure to be passive with no mechanical electrical elements; Use of precast elements if possible; Reinstatement of diversion channel. A new footbridge will be provided on top of embankment, landscape mitigation will incorporate new pedestrian path on top of embankment. 	Limekiln Road – ~165m to N.	No.
08146	Tymon Park	Integrated Constructed Wetland	<ul style="list-style-type: none"> Tree removal, temporary diversion of river, some instream works, excavating & saving topsoil, excavating to river level & removal of material, temporary access road, landscape mitigation works. 	Limekiln Road – ~45m to N.	Yes.
08151	Whitehall Park	Channel re-alignment, re-grading, and reinforcing existing walls	<ul style="list-style-type: none"> Tree removal, temporary diversion, excavating & saving topsoil, excavation and landscape mitigation works. Access gate from Whitehall Park to be installed for SDCC Parks Maintenance 	Whitehall Park, Whitehall Park & Grosvenor Court –	Yes.

Drawing No.	Location	Scheduled Works	Comments	Location of Nearest Sensitive Receivers	Potential Dust Impacts?
			<ul style="list-style-type: none"> General existing services to be brought to new channel and flapped Remove penstock at lakelands overflow weir Access improvement works at weir. 	~15m to works.	
08152	Wainsfort Manor Crescent	Reinforcing existing walls (Glendale Park and Terenure Badminton Club) & constructing new walls where none exist (at end of long gardens of houses on Limekiln Road) & temporary works / set down area with access off Wainsfort Manor Drive	<ul style="list-style-type: none"> Tree removal, instream works, walls construction. 	Wainsfort Manor Green – ~15m to works. Wainsfort Manor Crescent – ~15m to works.	No.
08155	Rear gardens at terrace of houses on Fortfield Road south of Kimmage Cross Roads	Replace existing walls	<ul style="list-style-type: none"> Tree removal, instream works, removing existing walls. walls pre-cast, Provide safe access for future clearance of inlet to culvert 	Fortfield Road - ~10m to works.	No.
08160	Ravensdale Park & Poddle Park	Combination of reinforcing existing walls and new walls (to middle of park); replacement footbridge; temporary works / set down area in Ravensdale Park; and sealed manholes in Poddle Park.	<ul style="list-style-type: none"> Tree removal, wall construction and manhole chamber replacement / rehabilitation Manhole upgrades involves work in the public roads in mainly residential areas 	Ravensdale Park & Poddle Park - ~15m to works.	No.
08165	St Martin's Drive	New wall at end of St Martin's Drive and	<ul style="list-style-type: none"> Tree removal, wall construction 	Poddle Park - ~15m to works.	No.

Drawing No.	Location	Scheduled Works	Comments	Location of Nearest Sensitive Receivers	Potential Dust Impacts?
		recladding existing wall along Poddle Park to match			
08170	Mount Argus	New walls at footbridge	<ul style="list-style-type: none"> Tree removal, wall construction 	Mount Argus Close - ~10m to works.	No.
08250 & 08251	Within public roads in Ravensdale Park, Donore Avenue, and St. Teresa's Gardens, and at National Stadium off S. Circular Road	Manhole chamber replacement / rehabilitation	<ul style="list-style-type: none"> Involves work mainly in the public roads in residential areas 	Within the public roads at Donore Avenue & St. Terese's Gdns. at the National Stadium off S. Circular Road	No.

13.5.3 Predicted Operational Impact at Sensitive Receivers

There will be no significant operational air quality and dust impact from this development.

13.6 Mitigation Measures

13.6.1 Construction Mitigation

The following dust mitigation measures will be employed to minimise construction dust impacts, the aim of which will be to minimise the release of dust to the environment. Outlined in detail below are the proposed dust suppression measures.

13.6.1.1 Operating and Dust Mitigation Measures

The site manager has the overall responsibility for ensuring that operations comply with the requirements of any planning authorisation. The site will have at its disposal a suitable water bowser and associated water supply to allow for dampening down of areas of the site works when windblown dust arises. The occurrence of potential wind-blown dust is very much weather dependent but suitable facilities will be available to minimise windblown dust from the site surfaces.

13.6.1.2 Working Hours

Construction activities will take place Monday to Friday, between 07:30 and 16:30, and as may be required on Saturdays from 08.00 hours to 13.00 hours. Evening and night-time work is not expected to take place, although it is possible that limited 24 hours working may be required to take place on occasion. This will only take place with the prior agreement of SDCC and DCC.

13.6.1.3 Access Roads, Site Roads and Vehicles Loading Activities & Movements

The objective of these procedures is to minimise the creation and release of dust generated by transportation activities carried out during both access to and movements within various areas of the construction site. This includes minimising dust from transport vehicles entering and leaving the facility.

- Regular attention shall be paid to cleaning dust material from all roadways, hard surfaced areas and working areas of the construction site. Dust from clean-up will be re-incorporated into stockpiles within the construction compound and adjacent to working areas. This will be done at appropriate intervals during the day and at the end of each working period.
- Roadways and other areas within the construction compound where vehicles are regularly moving shall be kept clean, by sweeping or by wetting;
- When loading vehicles within the construction compound and overall construction site, the following procedures will be adhered to:
 - No overloading of vehicles or containers resulting in either peaks of cargo or overspill onto the working areas or roadways.
 - Keep fall heights of the material into the transport vehicles to a minimum.
- Strictly applied, suitable on-site speed limits shall be set, displayed and observed for the movement of all vehicles (10 mph)

- Mandatory use of the wheel wash provided.

13.6.1.4 Stockpiling Operations

The aims of these procedures are to ensure that materials are stockpiled only within the designated process working areas and any release of dust to atmosphere is minimised.

- Stockpiling shall be co-ordinated in such a way as to minimise the potential for double handling of material and carefully planned to ensure minimum exposure to winds, thereby reducing dust emission to air.
- Stockpile areas will be clearly and physically delineated to deter vehicles from running over extracted material at the stock edge.
- Stockpiles shall be managed to ensure that the profile of material will be no higher than 2m which will minimise wind whipping.
- During embankment construction and any stockpiling, embankments and stockpiles shall be profiled and compacted by flattening out peaks and ridges and when partially worked, shall be re-contoured to prevent ridges or overhanging falls.
- Whenever possible, embankments and stockpiles shall not be broken into when the wind is likely to lift newly exposed dry dust. When this is unavoidable, effective dust control methods shall be implemented.
- Prior to carrying out any stockpile handling operations, the dust suppression equipment will be checked to ensure that it is working properly.

13.6.2 Monitoring & Reporting

- A high standard of housekeeping will be maintained on site.
- Contingency plans shall be made to provide dust control in the event of equipment malfunction, whether by loan, hire or other arrangements.
- Systems for monitoring processes, responding to and reporting pollution incidents shall be devised. This information shall be kept in a logbook, together with information regarding equipment failure, periods of significant dust emissions off-site and the inspection of roadways, together with any remedial action taken.
- Any complaints received from neighbouring properties will be logged and appropriate actions taken to reduce the potential for further complaint.

13.6.3 Dust Management Plan

The Dust Management Plan provided in **Table 13-10** will be implemented by the contractors at all times and special importance will be placed on these actions on high wind days.

Table 13-10: Dust Management Plan

Parameter	Action	Responsibility
Induction	<p>Induction for all employees will include information on:</p> <ul style="list-style-type: none"> • Potential sources of dust • Dust Management Plan, Monitoring program and awareness • Speed limits onsite and staying on designated roads • Who to report dust issues too 	Site Manager
Windy Conditions	<ul style="list-style-type: none"> • Monitor wind and weather forecasts and cease operations where dust cannot be controlled. 	Site Manager
Traffic	<ul style="list-style-type: none"> • Adhere to site speed limits and designated roads • Use of wheel wash when leaving site 	Drivers
Open Areas	<ul style="list-style-type: none"> • Minimise open areas exposed to wind erosion as much as practical by completing an assessment of all construction areas. 	Site Manager
Dust Suppression	<ul style="list-style-type: none"> • Operate water bowsers during dry, windy conditions and during the summer months, generally from April to September, across the site and construction compound to apply water to operational areas (<i>i.e.</i> roads, stockpile and loading areas) • All roads being used for heavy vehicle traffic within the construction area will be treated with dust suppression, where appropriate. • Apply dust suppression to all stockpiles prone to wind erosion. 	Site Manager
Soil stripping	<ul style="list-style-type: none"> • Conduct soil stripping only during suitable wind and weather conditions, so as to minimise the generation of dust. 	Site Manager
Loading & haulage	<ul style="list-style-type: none"> • Haul truck operators to monitor loading conditions and call on water bowser to dampen areas in dusty conditions. • Haul truck operators to monitor road conditions and call on water trucks to dampen roads when dusty • Haul truck operators to reduce speed to minimise dust. • On days where dust cannot be controlled shut down operations until dust can be satisfactorily managed. 	Site Operators
Record Keeping	<ul style="list-style-type: none"> • All actions undertaken for mitigation of dust during dusty conditions will be recorded by the site supervisor. • Document all readings, wind directions, area omitting dust and actions undertaken. • Determine compliance when auditing and reporting. 	Site Manager
Dust Monitoring	<ul style="list-style-type: none"> • Monitoring is required to enable an assessment of the effectiveness of the dust management controls and improvements to be made, where required. • Bergerhoff dust deposition monitoring along the construction compound perimeter and site boundaries where any prolonged construction activities will occur 	Site Manager

Parameter	Action	Responsibility
	<p>and where there are any reported construction dust complaints.</p> <ul style="list-style-type: none"> • A report on the results of this monitoring shall be available to the local authority on a quarterly basis. 	
Complaint Records	<ul style="list-style-type: none"> • Complaints will be logged and maintained on site. 	Site Manager
Performance Indicators	<p>The effectiveness of the Dust Management Plan will be reviewed against the following indicators:</p> <ul style="list-style-type: none"> • Compliance with guideline values for dust deposition monitoring. • The level of substantiated complaints received and registered. • The level of complaints satisfaction achieved. • The absence of fugitive dust originating from the site. • Audit results of compliance with actions 	Site Manager

13.6.4 Operational Mitigation

Not applicable. The proposed River Poddle Flood Alleviation Scheme will not result in an operational air quality and / or dust impact.

13.7 Residual Impacts

The potential for any air quality impact and dust deposition impact arising from the construction works along the River Poddle Flood Alleviation Scheme has been assessed.

The potential for nuisance dust impacts is considered to be negligible at the nearest sensitive receivers with appropriate mitigation measures employed. Dust deposition rates will be in accordance with relevant guideline limits assuming the recommended construction mitigation measures are adhered to. No significant air quality impacts are expected in an area of Dublin city that currently experiences good air quality, with reference to the EPA air quality monitoring data from the Rathmines and Tallaght EPA air quality monitoring stations.

There will be no air quality and dust impacts from the operation of the proposed River Poddle Flood Alleviation Scheme.

Once the above mitigation measures have been implemented, the residual impacts from the development will not be significant.