PORTSMOUTH CITY COUNCIL, BEST PRACTICE GUIDANCE

THE CONTROL OF DUST AND EMISSIONS FROM CONSTRUCTION AND DEMOLITION PROJECTS

Note: For sites with an estimated project cost greater than £300,000 excluding VAT this guidance should ideally be used in conjunction with the guidance for Site Waste Management Plans (SWMP) Regulations 2008.

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1. Introduction

Portsmouth City Council gives high importance to the protection of air quality and has designated 5 Air Quality Management Areas (AQMA) under the Environment Act 1995. Our 2010 Air Quality Action Plan (AQAP) attaches particular emphasis with the Planning Supplementary Planning Document on reducing the emission of fine particles in to the atmosphere and local emission sources from demolition and construction works have been targeted for action through this process.

It is an offence under the Environmental Protection Act 1990 (EPA) to cause nuisance to the inhabitants of the neighbourhood by generating dust. In cases where the Environment and Public Protection Service have received complaints, or has reason to believe that dust may be generated and nuisance is likely to occur, an investigation will be undertaken by Officers in accordance with the Council’s policy on the investigation and assessment of dust nuisance complaints. On completion of these investigations, if nuisance is considered to be occurring due to activities on site, an Abatement Notice is likely to be served upon the contractor.

When undertaking demolition or construction works during periods of dry and/or windy weather, dust problems often prevail, particularly on sites bordered by residential properties. The EPA requires that Best Practicable Means (BPM) must be taken to prevent dust causing a nuisance and it is the duty of the contractor to demonstrate to us that all reasonable remedial action has been implemented.

By following this Best Practice Guidance developers are able to identify good practice methods for demolition and construction. Compliance with this document does not necessarily offer exemptions from prosecution under any of the legislation impacting upon demolition and construction, though it should be recognised that using BPM could be used as a defence from prosecution.

Developers should take elements of this Best Practice Guidance into account depending on the level of risk identified for the particular construction site.

Where possible, best practice mitigation measures should be carried out at all times, although it may be impossible to fully comply with the guidance for certain emergency works. In these cases, the developer should provide the Environment and Public Protection Service as much notice as possible.

1.1. How to use this guidance

The following 3 principles are well established and are central to the control strategies suggested by this Guidance.

1. Prevention
2. Suppression
3. Containment

The 3 principles are embedded in this guidance and are used in a way that is appropriate to the scale of a particular development and the potential exposure of
site workers, residential neighbours and other susceptible receptors. The content illustrates how to assess a development for its potential risk and what controls and mitigation measures should be put in place.

2. Air Quality Impact Evaluation

A site evaluation should be conducted before any work activities begin on site. This should assess the likely impact of a development, based on size and location, will have on local air quality both inside and outside the site boundary. This applies to all proposed construction activities, including demolition, site clearing and construction phases.

In order to successfully control demolition and construction activity, it is important to evaluate the risk from pollutants emitted from site. It is envisaged that this approach will bring additional benefits, such as a reduction in the number of nuisance complaints; the majority of which relate to dust and noise emitted from construction activities.

2.1. Site evaluation

The need and ability of a developer to deploy effective control measures is often dependant on the size and scale of a development. In addition, consideration will need to be given to site location with regard to local air quality and ground conditions.

Therefore, it is the intention of this document that best practice activity uses the following criteria to assess the potential impact of a demolition or construction site.

Take account of these criteria:

- the area taken up by the development;
- the number of properties being developed;
- the potential impact of the development on sensitive receptors close to the development, for example residential, schools, hospitals, rest homes and other building uses which would be affected by high levels of air pollution or dust;
- is the site located in an Air Quality Management Area. See www.portair.co.uk;
- is the site located on contaminated land.

2.2. Site impact

The potential for a demolition or construction site to impact at sensitive receptors is dependant on many factors, which include the following:

- location of the building site;
- proximity of sensitive receptors;
- whether demolition will need to take place;
- extent of any intended excavation;
- nature, location and size of stockpiles and the length of time they are to be on-site;
- occurrence and scale of dust generating activities - including cutting, grinding and sawing;
• necessity for on-site concrete crusher or cement batcher;
• number and type of vehicles and plant required on-site;
• potential for dirt or mud to be made airborne through vehicle movements;
• weather conditions.

A small number, or even one, of these factors may be the cause of increased or prolonged impact on sensitive receptors. In many cases developers’ own experience will provide the knowledge needed to judge the likely impact of each activity.

2.3. Site Evaluation Guidelines

**Low Risk Sites**
Development of one property and up to a maximum of 10 and;
Potential for emissions and dust to have an infrequent impact on sensitive receptors
Not located in or near an AQMA
Not located on contaminated land

**Medium Risk Sites**
Development of between 10 to 50 properties and;
Potential for emissions and dust to have an intermittent or likely impact on sensitive receptors
Located near to AQMA or contaminated land

**High Risk Sites**
Development of over 50 properties or;
Major development defined by planning
Potential for emissions and dust to have significant impact on sensitive receptors
Located in an AQMA
Located on contaminated land

2.4. Mitigation Measures for Low Risk Sites

2.4.1. Site Planning

- Erect effective barriers around dusty activities or the site boundary;
- No bonfires;
- Plan site layout machinery and dust causing activities should be located away from sensitive receptors.

2.4.2. Construction Traffic

- All vehicles should switch off engines – no idling vehicles;
- Wash or clean all vehicles effectively before leaving the site if close to sensitive receptors;
- All loads entering and leaving site to be covered;
- No site runoff of water or mud;
- All Non Road Mobile Machinery (NRMM) to use ultra Low Sulphur tax-exempt Diesel (ULSD) where available.
2.4.3. Demolition Works

- Use water as dust suppressant;
- Cutting equipment to use water as suppressant or suitable local exhaust ventilation systems;
- Securely cover skips and minimise drop heights.

2.4.4. Site Activities

- Minimise dust generating activities;
- Use water as dust suppressant where applicable;
- Keep stockpiles for the shortest possible time.

2.5. Mitigation Measures for Medium Risk Sites

2.5.1. Site Planning

- Erect solid barriers to site boundary;
- No bonfires;
- Plan site layout – machinery and dust causing activities should be located away from sensitive receptors;
- Identify responsible person in charge;
- Hard surface site haul routes.

2.5.2. Construction Traffic

- All vehicles to switch off engines – no idling vehicles;
- Effective vehicle cleaning and specific wheel-washing on leaving site;
- All loads entering and leaving site to be covered;
- No site runoff of water or mud;
- All NRMM to use ULSD where available;
- Hard surfacing and effective cleaning of haul routes and appropriate speed limit around site.

2.5.3. Demolition Works

- Use water as dust suppressant;
- Cutting equipment to use water as suppressant or suitable local exhaust ventilation systems;
- Securely cover skips and minimise drop heights;
- Wrap buildings to be demolished.

2.5.4. Site Activities

- Minimise dust generating activities;
- Use water as dust suppressant where applicable;
- Enclose stockpiles or keep them securely sheeted;
- If applicable, ensure concrete crusher or concrete batcher has permit to operate.
2.6 Mitigation Measures for High Risk Sites

2.6.1. Site Planning

- Erect solid barriers to site boundary;
- No bonfires;
- Plan site layout – machinery and dust causing activities should be located away from sensitive receptors;
- All site personnel to be fully trained;
- Trained and responsible manager on site during working times to maintain logbook and carry out site inspections;
- Hard surface site haul routes;
- Use nearby rail or waterways for transportation to/from site;
- Put in place real-time dust monitors across site.

2.6.2. Construction Traffic

- All vehicles to switch off engines – no idling vehicles;
- Effective vehicle cleaning and specific fixed wheel washing on leaving site and damping down of haul routes;
- All loads entering and leaving site to be covered;
- No site runoff of water or mud;
- On-road vehicles to comply to set emission standards;
- All NRMM to use ULSD where available and be fitted with appropriate exhaust after-treatment from the approved list;
- Minimise movement of construction traffic around site;
- Hard surfacing and effective cleaning of haul routes and appropriate speed limit around site.

2.6.3. Demolition Works

- Use water as dust suppressant;
- Cutting equipment to use water as suppressant or suitable local extract ventilation;
- Use enclosed chutes and covered skips;
- Wrap building(s) to be demolished.

2.6.4. Site Activities

- Minimise dust generating activities;
- Use water as dust suppressant where applicable;
- Cover, seed or fence stockpiles to prevent wind whipping;
- Re-vegetate earthworks and exposed areas;
- If applicable, ensure concrete crusher or concrete batcher has permit to operate.

3. Method Statement

A method statement should cover all phases of the development and take account of all contractors or sub-contractors. It should be submitted to the Local Planning Authority (LPA) prior to any works being carried out and include a site evaluation (see
Section 2.1) and a timetable of dust generating activities accompanied with proposed dust control measures. A method statement could be required by the LPA via a condition attached to the planning consent.

The content of a method statement will be determined by the site evaluation but typical features to include are outlined below.

### 3.1. For All Sites

- Summary of work to be carried out;
- Description of site layout and access – including proposed haul routes, location of site equipment including supply of water for damping down, source of water, (wherever possible from dewatering or extraction), drainage and enclosed areas;
- Inventory and timetable of all dust generating activities;
- List of all dust and emission control methods to be used;
- Details of any fuel stored on site;
- Identification of an authorised responsible person on-site for air quality. Ideally this person needs to have knowledge of pollution control and vehicle emissions;
- Summary of monitoring protocols and agreed procedure of notification to the local authority nominated person(s);
- A site log book to record details and action taken in response to exceptional incidents or dust-causing episodes. It should also be used to record the results of routine site inspections.

### 3.2. For all sites with a total project cost exceeding £300,000, prepare a site waste management plan in accordance with Site Waste Management Plans (SWMP) Regulations 2008.

### 3.3. Additional Information for High Risk Sites

An approved list of all NRMM to be used on site and appropriate after-treatment technology is available on the Energy Saving Trust website. See [www.est.org.uk](http://www.est.org.uk) for details.

Details of the contractor’s workforce training in areas such as health and safety, best practice methods, site housekeeping, reporting procedures and communication must be made available. All staff should have some training of on site pollution policy, perhaps as part of site induction training.

### 3.4. Specific Site Issues

A LPA may also make management of the following issues a condition of a method statement.

#### 3.4.1. Asbestos

For sites with potentially asbestos-containing materials, a separate method statement will need to be produced by a specialist asbestos treatment contractor. An independent professional should approve the statement to ensure that no person at work or member of public is exposed to a harmful release of asbestos during works.
3.4.2. Demolition

Developers must notify the Building Control Team of the relevant local authority of any building demolition works under sections 80 and 81 of the Building Act 1984. Demolition may commence after six weeks has elapsed from the submission of the notification or after the local authority has issued a counter notice, which will require certain tasks to be carried out.

Developers should consider referring to the demolition protocol set up by the ICE (Institution of Civil Engineers) and CIWM (Institute of Waste Management) 14. This protocol provides best practice on aspects such as building audits and use of recycled materials to be reused on site or elsewhere.

3.4.3. Contaminated Land

Many construction sites in Portsmouth will be on brownfield sites and it will be appropriate to consider the following:

- Inclusion of contaminated land issues in the method statement, in the context of identifying potential emissions to air and protecting human health;
- Providing details of specific control measures for sites with potential contaminated land issues;
- Developers should refer to legislation and procedures such as EPA 1990, Building Regulations Approved Document C, PPS23 and CLR11 for more information.

4.0. Dust and Emissions Control Measures

Developers will need to ensure that all on-site contractors follow BPM at all times to minimise dust and emissions. The following sub-sections identify the activities that are most likely to produce dust and outlines BPM. All appropriate measures should be included in the method statement.

4.1. Pre-Site Preparation

For all sites with areas of open ground that are close to sensitive receptors, developers should follow best practice to prevent dust and other pollutant emissions from being carried outside the boundary.

**Low Risk Sites**

- Machinery, fuel and chemical storage and dust generating activities should not be located close to boundaries and sensitive receptors if at all possible;
- Erect effective barriers around dusty activities or the site boundary.

**Medium and High Risk Sites**

- As for low risk sites;
- Erect solid barriers to site boundary.

**High Risk Sites and those exceeding £300,000 must comply with SWMP.**
4.2. Haulage Routes

4.2.1. Surface of Roads

Unpaved haul routes can account for a significant proportion of fugitive dust emissions, especially in dry or windy conditions, when the generation of dust through the movement of vehicles is exacerbated. It is recommended that to comply with good practice, developers should ensure that hard surfaces or paving are used for all haul routes, even if routes are temporary.

**Low Risk**
- Use consolidated surfaces on roads near to residential areas.

**Medium Risk**
- As for low risk sites;
- Hard surface all major haul routes through the site (e.g. use recycled rubber blocks, concrete blocks or tarmac);
- Regularly inspect haul routes for integrity and repair if required;
- When the haul route changes, re-use surface where possible.

**High Risk**
- As for medium risk sites. In addition, lay roads to a camber to prevent puddles;
- Comply with SWMP.

4.2.2. Damping Down

Developers will need to wash or damp down haul routes both within and outside the site. This is particularly important for sites close to residential properties or other sensitive receptors. Developers should consider the environmental and economic benefits from the use of groundwater sources on site, as opposed to bringing drinking water onto site for the purpose of dust suppression. Where possible the source of water should be sustainable to maximise use and re-use of this resource.

**Low Risk**
- Use agreed wet cleaning methods or mechanical road sweepers on all roads during periods of dry weather;
- Clean road edges and pavements using agreed wet cleaning methods.

**Medium Risk**
- As for low risk sites;
- Use agreed wet cleaning methods or mechanical road sweepers on all roads at least once a day or consider using fixed or mobile sprinkler systems;
- Provide hardstanding areas for vehicles and regularly inspect and clean these areas.
**4.2.3. Vehicles**

All developers should carry out the following controls to reduce dust and particulates associated with vehicles - such as that from exhaust emissions, the contact of tyres on the road surface or dust blowing from materials carried.

**Low Risk**

- All vehicles should switch off engines - no idling;
- Clean or wash all vehicles effectively before they leave a site if there is a risk of affecting nearby sensitive receptors;
- All loads entering and leaving site to be covered.

**Medium Risk**

- As for low risk sites;
- Wheel wash vehicles before they leave a site;
- Hard surface haul routes and clean them effectively;
- Impose an appropriate speed limit around site.

**High Risk**

- As for low and medium risk sites;
- Fixed wheel and/or vehicle washing at site exit;
- Use fixed or mobile sprinkler systems to clean internal and external roads at least once a day;
- Comply with SWMP.

**4.3 Site Entrances and Exits**

Developers should employ the following control measures to help prevent dust being spread outside the site boundary by site vehicles at entrances and exits.
4.4. Mobile Crushing Plant

This section only applies to construction sites that will operate mobile crushing plant at some point. This is an inherently dusty activity and will often be on sites normally classed as medium or high risk.

- Notify the local authority if a crusher is to be used as it has a duty to inspect the process. Mobile crushing plants are authorised as Part B processes, even if they are only temporary;
- Keep a copy of the permit on-site and adhere to the conditions therein at all times;
- Refer to Process Guidance note PG 3/16 (04)12 and use Best Available Techniques (BAT) according to the guidance at all times.

4.5. Concrete Batching

As for mobile crushing plants, construction sites with concrete batching plants will often be categorised as medium or high risk.

- Developers following this guidance should treat such plant as authorised Part B processes, even if temporary, and employ the same level of best practice as indicated below. The local authority should be notified if a concrete batcher is to be used on site;
- Refer to Process Guidance note PG 3/1 (04)12 and carry out BAT;
4.6. Excavation and Earthworks

Excavation and earthwork activities can be a potential source of dust outside the site if they are not properly controlled. If these activities are essential, then developers need to act to minimise dust disturbance as much as possible.

**Low Risk**
- All dusty activities should be damped down, especially during dry weather;
- Temporarily cover earthworks if possible;
- Minimise drop heights to control the fall of materials.

**Medium and High Risk**
- As for low risk sites;
- Re-vegetate earthworks and other exposed areas to stabilise surfaces;
- Only remove secure covers in small areas during work and not all at once;
- Use hessian, mulches or tackifiers where it is not possible to revegetate or cover with topsoil;
- Comply with SWMP.

4.7. Stockpiles and Storage Mounds

Developers should avoid the use of long-term stockpiles on-site wherever possible unless it performs the function of visual or noise screening. If necessary, the following measures should be in place:

**Low Risk**
- Make sure that stockpiles exist for the shortest possible time.

**Medium Risk**
- As for low risk sites;
- Do not build steep sided stockpiles or mounds or those that have sharp changes in shape;
- Whenever possible, keep stockpiles or mounds away from the site boundary, sensitive receptors, watercourses and surface drains;
- Wherever possible, enclose stockpiles or keep them securely sheeted.

**High Risk**
- As for low and medium risk sites;
- Comply with SWMP;
- Take into account the predominant wind direction when siting stockpiles to reduce the likelihood of affecting sensitive receptors;
- Seed, re-vegetate or turf long term stockpiles to stabilise surfaces or use surface binding agents that have been approved by the Environment Agency;
o Re-use hard core material where possible to avoid unnecessary vehicle trips;
  o Erect fences or use windbreaks such as trees, hedges and earth-banks of similar
    height and size to the stockpile to act as wind barriers and keep these clean using
    agreed wet methods;
  o Store fine or powdery material (under 3mm in size) inside buildings or enclosures;
  o Contact the Environment Agency if you need an exemption to stockpile waste
    material, whose disposal is subject to the Waste Management Licensing
    Regulations (WMLR) 1994. The treatment or ultimate disposal of this material is
    subject to the regulations.

4.8. Cutting Grinding and Sawing

Ideally, these activities should not be conducted on site and pre-fabricated material
should be brought in where possible. In cases where such work must take place,
then the following techniques should be followed.

A simple method to reduce dust emissions when cutting or grinding - this method is
suitable for all sizes of demolition or construction sites. When materials, such as
concrete slabs or bricks, are cut with a power tool without extraction or suppression,
a second worker can pour water from a plastic bottle over the material as it is being
cut. This greatly reduces the amount of dust generated and can stop the occurrence
of a statutory nuisance.

Low Risk

  o All equipment should use water suppressant or suitable local exhaust ventilation
    systems.

Medium and High Risk

  o Use dust extraction techniques where available;
  o All other equipment should be fitted with water suppressant systems;
  o Use local exhaust ventilation;
  o Service all fans and filters regularly to ensure they are properly maintained.

4.9. Chutes and Skips

Low and Medium Risk

  o Securely cover skips;
  o Minimise drop heights to control the fall of materials;
  o Regularly damp down surfaces with water.

High Risk

  o As for low and medium risk sites;
  o Completely enclose skips whenever possible;
  o Hard surface areas where skips are to be stored;
  o Reduce drop heights by using variable height conveyors or chutes;
  o Comply with SWMP.
4.10. Scabbling

Scabbling is the process of grinding concrete using a machine tipped with steel or carbide material to rapidly pound it. The following measures should be in place at all sites to comply with BPM:

- Pre-wash work surfaces;
- Screen off work areas;
- Vacuum up all dusty residue rather than sweeping away.

4.11. Waste Disposal/Burning

Taking into account the Clean Air Act 1993 and nuisance legislation (the EPA), this Best Practice Guidance recommends that:

- No burning of any material is permitted on site;
- All excess material should not be wasted, but used or safely removed from site according to appropriate legislation.

**High Risk**

- In addition to the above, the developer should produce a site waste management or recycling plan following guidance on Sustainable Design and Construction. Further information on waste plans is provided on the Environment Agency website;
- The Environment Agency suggests that a waste plan includes the following best practice procedures:
  - Identify the waste types that are likely to be produced and aim to reduce the amount of waste as much as possible, through identifying routes to reuse or recycle materials;
  - Control access to storage areas to minimise risk of theft or damage;
  - Set up a dedicated store for timber, from which workers can re-use supplies;
  - Store any materials away from sensitive locations in fenced off areas;
  - Label all waste storage and skips, detailing the type of waste;
  - Employ a just-in-time policy to deliver materials in order to reduce the storage time on-site;
  - Consider using recycled materials and recycle any materials used on-site rather than disposing of them (including timber, aggregates, soil, tarmac, bricks, masonry, concrete and glass). CIRIA provides lists of recycled materials that companies will accept;
  - If practicable, remove materials for recycling from buildings prior to demolition or from demolition spoil.

4.12. Dealing with spillages

For all sites, the following measures should be followed:

- Use bunded areas wherever practicable;
4.13 Demolition Activities

Potential dust hazards can be assessed according to BS 6187: Code of Practice for Demolition, which includes all aspects of project development and management from demolition techniques to re-using or recycling materials. The demolition of buildings may result in a site being classified as medium or high risk during this activity.

Any asbestos must be dealt with by a registered contractor at all times and removed according to appropriate regulations and approved codes of practice/HSE guidance. Developers must carry out a Type 3 asbestos survey and undertake the following tasks:

- Notify the Health and Safety Executive of any work;
- Always employ competent and licensed contractors;
- Clearly identify the location of asbestos containing materials before starting work;
- Put in place procedures to sample and analyse suspect materials;
- Carry out independent air sampling to ensure standards are met;
- Dispose of asbestos-containing materials to licensed waste sites according to HSE guidelines before the demolition company is given access.

Other examples of best practice in demolition:

- Sheet and screen buildings with suitable material and where possible strip inside buildings before demolition begins;
- Ensure that a specialist contractor removes any asbestos before demolition;
- Materials should be removed from site as soon as possible. If stored, techniques covered in section 4.8 should be followed;
- Avoid explosive blasting where possible and consider using appropriate manual or mechanical alternatives;
- Bag and remove any biological debris or damp down before demolition.

Developers should refer to Sections 80-82 of the Building Act 1984 and the ICE Demolition Protocol.

4.14 Hazardous and Contaminated Materials

Under the Control of Substances Hazardous to Health (COSHH) Regulations 2002, developers must ensure that they take into account risks to the workforce from exposure to any harmful substances generated by work activities. Construction sites are often associated with activities that emit Volatile Organic Compounds (VOCs), such as use of paints, adhesives, bitumen products and concrete and timber
treatments. Emphasis should be placed on preventing or reducing emissions at source and where this is not possible personal protective equipment may be appropriate.

Developers should employ similar techniques according to appropriate legislation and low emission products, which comply with the new EU Paints Directive 22, should be used whenever possible. In addition, guidance is available to prevent the contamination of water courses from construction sites, such as CIRIA’s documents C64823 and C53224.

4.15. Specific Site Activities

Other activities, specific to some demolition and construction sites, also have the potential to generate dust without proper control. The BPM for each activity is outlined below:

4.15.1. Sand, Grit and Shot Blasting
- Use agreed wet processes, sheet areas to contain dust and use silica-free material.

4.15.2. Plaining and Sanding
- Use fans and/or filters, dust suppression techniques and water sprays.

4.15.3. Fitting Out
- Fit all machinery for activities such as plastering, sanding or rendering with dust suppression/collection equipment;
- Vacuum all waste material.

4.15.4. Welding and Soldering
- Follow control measures in HSE guidance notes EH54 and EH55.

4.15.5. Tarmac Laying and Use of Bitumen
- Do not overheat bitumen and cover pots;
- Use great care in all processes to prevent spillages and extinguish any accidental fires immediately.

5. Site Monitoring

5.1. Site Monitoring Protocols

If best practicable means are followed correctly, then formation of dust and harmful emissions from construction sites should be minimised as much as possible.

However, continuous site monitoring is still an important way of helping developers manage dust and PM10 emissions from construction and demolition. The location of a construction site could impact on a local area to the extent where air quality is
worsened within an existing AQMA or is worsened to the extent where an AQMA needs to be declared by the relevant local authority.

This section specifies air quality monitoring protocols that should be followed according to the identified risk of the site. Monitoring of air pollution from all demolition and construction sites should be undertaken. This will vary from visual assessments for low risk sites to the installation of real time automatic monitors for PM10 for high risk sites. On certain sites it may be appropriate to determine the baseline situation before construction begins. The local planning authority (LPA) will provide advice on the appropriate air quality monitoring procedure and timescale - the requirements of which will be determined on a case by case basis.

Where the LPA requires automatic real-time air quality monitoring to be carried out by the developer, 2 frequently used procedures are:

- Monitoring along a transect (straight line) across the construction site, set up in the direction of the prevailing wind. This will allow the developer to take into account background levels to determine the relative contribution of air quality and dust emissions from the construction site. Prior monitoring of background air quality may not be needed in this case;
- Monitoring to take place close to sensitive receptors to assess any impact at these locations.

**Low Risk**

- Employ best practice methods at all times;
- Take into account the impact of air quality and dust on occupational exposure standards to minimise worker exposure and breaches of air quality objectives that may occur outside the site boundary, such as by visual assessment;
- Keep an accurate log of complaints from the public.

**Medium Risk**

- As for low risk sites;
- Determine the prevailing wind direction across the site using data from a weather station;
- If measuring along a transect:
  - Set up a transect across the site according to the direction of the prevailing wind;
  - Operate a minimum of 2 automatic particulate monitors to measure PM10 levels at either end of the transect - either inside or outside the site boundary. These instruments should provide data that can be downloaded in real-time by the local authority;
- If monitoring at sensitive receptors:
  - Identify which location(s) need to be monitored and set up an automatic particulate monitor at each of these to measure representative PM10 levels. These instruments should provide data that can be downloaded in real-time by the local authority.
- If relevant, supplement monitoring with hand-held monitors to get on the spot readings at selected points, such as close to sensitive receptors;
o Consider also monitoring dust deposition and soiling rates as these can be used to indicate nuisance.

**High Risk**

- As for medium risk sites;
- Set a site action-level see Section 5.2.;
- Determine prevailing wind direction, as for medium risk sites, or by setting up a weather station on-site to measure local wind direction and speed;
- If measuring along a transect:
  - Set up a transect across the site according to the direction of the prevailing wind.
  - Operate a minimum of 2 automatic particulate monitors to measure PM10 levels at either end of the transect - either inside or outside the site boundary.
  - These instruments should provide data that can be downloaded in real-time by the local authority.
- The LPA may also require monitoring at sensitive receptors. If this is the case:
  - Identify which location(s) need to be monitored and set up an automatic particulate monitor at each of these to measure representative PM10 levels. These instruments should provide data that can be downloaded in real-time by the local authority.
- If applicable, supplement with low cost automatic monitors or hand-held monitors, particularly focusing on any sensitive locations such as schools;
- Carry out dust deposition and soiling rate assessments following recommended procedures;
- Carry out a visual inspection of site activities, dust controls and site conditions and record in a daily dust log;
- Identify a responsible person on-site for dust monitoring who can access real-time PM10 data from automatic monitors (e.g., at hourly or 15 minute intervals). Ensure that adequate quality assurance/quality control is in place;
- Agree a procedure to notify the local authority, so that immediate and appropriate measures can be put in place to rectify any problem. Alert mechanisms could include email, texts or alarm systems;
- Set up 24-hour phone hotlines so that residents can complain about high dust or PM10 levels directly to the developer. Consider circulating summaries of monitoring results to the local community.

### 5.2. Site Action Levels

It is common procedure in other Countries to set a maximum action level for PM$_{10}$ concentrations at the boundary of a work site. For example, a limit of 150 µg/m³, as a one-hour average, is typically set downwind of hazardous waste sites in the USA. If this is exceeded, the developer should monitor upwind and if this concentration is greater than 100 µg/m³ above background and there is visible dust outside the site, additional controls should be put in place, such as personal protection for workers or suspending work if levels do not decline.

A site action limit should be set, based on the risk assessment and background PM$_{10}$ level and the LPA should agree this in advance.
The London Borough of Greenwich enforced a site action level of 125 \( \mu g/m^3 \), as a 15 minute average, during the construction of the New Millennium Experience and the Greenwich Millennium Village. This action level was successful in promoting best practice and no complaints of dust emissions were received by the local authority.

- For example, a minimum site action is recommended to be 250 \( \mu g/m^3 \) over 15 minutes (or 200 \( \mu g/m^3 \) for Tapered Element Oscillating Monitor (TEOM) measurement) - especially important for high-risk sites. If this level is breached it may indicate that best practice is not being achieved. Developers should check that, where the site action level is at risk of being exceeded, best practice is in place as this could be used as a defence from prosecution under the EPA.

Where the site action level is being significantly breached, developers should stop work whilst ensuring that best practice measures are in place before restarting. It should be noted that the Environment and Public Protection Service will use breaches of site action levels as a basis for making a site visit and will use all powers at our disposal to prevent statutory nuisance.

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