Local Government Air Quality Toolkit

Resource pack

Information and checklists for inspections, complaints and assessments to do with air quality issues

NSW GOVERNMENT

Acknowledgement of Country

Department of Climate Change, Energy, the Environment and Water acknowledges the Traditional Custodians of the lands where we work and live.

We pay our respects to Elders past, present and emerging.

This resource may contain images or names of deceased persons in photographs or historical content.

The Local Government Air Quality Toolkit has been developed by Department of Climate Change, Energy, the Environment and Water in collaboration with the NSW Environment Protection Authority, the NSW Department of Planning, Housing and Infrastructure, Local Government NSW and local councils.

Cover photo: Car that was being spray painted in a suburban backyard. Emily Nicolson/MidCoast Council

Artist and designer Nikita Ridgeway from Aboriginal design agency – Boss Lady Creative Designs, created the People and Community symbol.

Published by:
Environment Protection Authority and
Department of Climate Change,
Energy, the Environment and Water
Locked Bag 5022, Parramatta NSW 2124
Phone: +61 2 9995 5000 (switchboard)
Phone: 1300 361 967 (Environment and Heritage enquiries)
TTY users: phone 133 677, then ask for 1300 361 967
Speak and listen users: phone 1300 555 727, then ask for 1300 361 967
Email info@environment.nsw.gov.au
Website www.environment.nsw.gov.au

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1. Overview and structure

The Local Government Air Quality Toolkit – *Resource pack* is a central location within the toolkit for checklists and practical advice and has been referenced throughout the 3 modules. The resource pack aims to provide a one-stop shop for any documentation required for inspections, complaints and assessments.

Where relevant, the information provided is industry specific (e.g. dust generating activities site inspection checklist). In other cases, the information is generic (e.g. assessment and dispersion modelling checklist).

The structure of the resource pack is as follows:

- Chapter 2: Completing a site inspection
- Chapter 3: Investigating complaints
- Chapter 4: Systematic investigations
- Chapter 5: Deciding on a course of action
- Chapter 6: Consultants and assessment of dispersion modelling
- Chapter 7: Operational and control recommendations.

The advice and guidance provided is framed in terms of the broader context of local government administration. It is recognised that each council has its own procedures and internal administrative policies for processing consent applications and dealing with problem industries and businesses.

The case studies, checklists and example operational and control recommendations provided throughout the Local Government Air Quality Toolkit guidance notes and this resource pack are for illustrative purposes and include information to help councils regulate in a fair, consistent and transparent way. The Toolkit does not cover all regulatory tools under key environment protection legislation and is not a substitute for a thorough understanding of the legislation council officers administer, for appropriate training or for the need to obtain councils' own legal advice.

Council officers should consider the circumstances of the specific cases they are faced with and their own council's investigation and compliance policies when undertaking their regulatory functions.

Larger councils tend to divide duties and functions according to their broad environmental responsibilities. Certain officers might develop expertise in dealing with specific types of industries in the area; for example, smash repairers or poultry producers. Officers should be encouraged to share their expertise, both formally and informally, as already happens in regional networks.

Sharing knowledge and experience within and between councils will build the capability of all council officers to better manage air pollution issues.

2. Completing a site inspection

Local council officers are often required to complete a site inspection of a workplace facility or domestic premises.

Generally, before visiting a site for an inspection or assessment the following should be checked:

- consent conditions for the premises of the activity
- facility status (scheduled or non-scheduled)
- any previous reports on file including diagrams, photographs, maps, etc.
- proximity of the facility to sensitive receptors
- whether any personal protective equipment will be needed when attending on site.

The sections below provide guidance for conducting site inspections for the following:

- dust generating activities (principally small quarries and construction sites)
- spray painting and surface coating activities
- odour from food outlets (including restaurants, cafes, coffee roasters and craft breweries)
- smoke from wood heaters and backyard burning
- agricultural burning.

2.1 Dust generating activities

The checklist below has been prepared for dust generating activities, principally small quarries and construction sites. The checklist should be scrutinised prior to the inspection to be aware, in advance, of key factors or risks to be identified during the site visit.

Some of the content included below has been adapted from the UK Institute of Air Quality Management (IAQM) guidance document titled *Guidance on the assessment of dust from demolition and construction* (IAQM 2024). Whilst the guidance and mitigation measures included in that guidance document were written for use in the UK, it is widely used across New South Wales and Australia.

A dust event diary is also provided below as an example of a diary that can be specified by council as the one to be used by site operators to keep track of dust events. It should be noted that the diary includes an additional check for sites with upwind and downwind real-time continuous particulate monitoring.

The following supporting documentation included in the Local Government Air Quality Toolkit can be used in conjunction with the checklist:

- *Construction sites guidance note*
- *Dust from construction sites visual guide*
- *Dust from small quarries visual guide*.

Dust generating activity inspection checklist

Inspection details	
Site name	
Location	
Date of inspection	
Time of inspection	
Attendees at inspection (council and site personnel)	

Checklist item	Yes	No	N/A
General			
Are responsible personnel at the site?	☐	☐	☐
What are the activities being carried out on site? (select all that apply):			
• Land clearing and earthworks related to excavation and compaction activities	☐	☐	☐
• Operation of heavy machinery and related equipment for earthmoving and construction (excavators, bulldozers, front-end loaders, cranes, etc.)	☐	☐	☐
• Erecting structures using steel, concrete, brick, glass, timber and other materials	☐	☐	☐
• Mechanical activities including grinding, hammering, drilling, grit blasting and demolition	☐	☐	☐
• Transport of materials and product onto and off site	☐	☐	☐
• Movement of vehicles along roadways and paths, in and out of the site and within the site, together with any establishment and maintenance of the roadways (e.g. grading)	☐	☐	☐
• Metal joining and finishing, including welding, brazing, soldering and other techniques	☐	☐	☐
• Stockpiling of materials, transfer through chutes and loading onto trucks	☐	☐	☐
• Application of surface coatings and finishes using paints and adhesives	☐	☐	☐
Preparing and maintaining the site			
Are machinery and dust causing activities located away from receptors, as far as is possible?	☐	☐	☐
Have solid screens or barriers been erected around dusty activities or the site boundary that are at least as high as any stockpiles on site?	☐	☐	☐

Checklist item	Yes	No	N/A
Are there windbreaks?	☐	☐	☐
If yes, are the wind breaks fully maintained?	☐	☐	☐
If not, can temporary windbreaks be established?	☐	☐	☐
Is site runoff of water or mud avoided?	☐	☐	☐
Are site fencing, barriers and scaffolding kept clean?	☐	☐	☐
Are seed or fence stockpiles covered, seeded or fenced to prevent wind whipping?	☐	☐	☐
Have exposed areas/soil stockpiles been stabilised?	☐	☐	☐
Are sand and other aggregates stored in bunded areas?	☐	☐	☐
Site management			
Is there a stakeholder communications plan?	☐	☐	☐
Are staff trained and aware of their responsibilities?	☐	☐	☐
Is an air quality management plan (AQMP) in place?	☐	☐	☐
Is the site tidy and free of excessive quantities of refuse and debris?	☐	☐	☐
Are all dust and air quality complaints recorded (e.g. in accordance with licence conditions), including identification of the cause?	☐	☐	☐
Following any complaints (if any), have appropriate measures been taken in a timely manner to reduce the emissions, and have these measures been recorded?	☐	☐	☐
Have any exceptional air quality events been recorded in the past week, either regional events (e.g. a bushfire or dust storm) or site-specific events (e.g. a high-wind event)?	☐	☐	☐
Has action been taken to resolve the air quality event?	☐	☐	☐
Has the site management taken adequate precautions with respect to hazardous materials management, including wastes such as paints, solvents, lubricating oil?	☐	☐	☐
Operations			
Are enclosed chutes, conveyors and covered skips used where applicable?	☐	☐	☐
Are drop heights minimised from conveyors, loading shovels, hoppers and other loading or handling equipment?	☐	☐	☐
Are fine water sprays used on conveyors, loading shovels, hoppers and other loading or handling equipment?	☐	☐	☐

Checklist item	Yes	No	N/A
Is equipment readily available on site to clean any dry spillages?	☐	☐	☐
Operating vehicle/machinery and sustainable travel			
Do vehicles switch off engines when stationary?	☐	☐	☐
Are diesel- or petrol-powered generators avoided on site?	☐	☐	☐
Is mains electricity or battery powered equipment used where practicable?	☐	☐	☐
Are maximum-speed limits imposed and signposted on site?	☐	☐	☐
Monitoring			
Is any air quality monitoring undertaken at the site?	☐	☐	☐
Are all monitors functional and operating correctly?	☐	☐	☐
Do the air monitoring results indicate a problem?	☐	☐	☐
Are daily on-site and off-site dust inspections undertaken, where receptors (including roads) are nearby?	☐	☐	☐
Are inspection or monitoring results available to view?	☐	☐	☐
Dust suppression			
Are earthmoving and excavation activities managed so as to reduce dust emissions as far as practicable?	☐	☐	☐
Are water carts or water sprays used on unsealed roads?	☐	☐	☐
Are chemical dust suppressants used on unsealed roads?	☐	☐	☐
Are water sprays used on other areas?	☐	☐	☐
Are dust suppression techniques used when conducting cutting, grinding or sawing?	☐	☐	☐
Spray painting and sand or grit blasting			
Have control measures been considered for these activities (e.g. timing for sand blasting or spray painting)?	☐	☐	☐
Has wind direction and the proximity of sensitive land uses been considered when conducting these activities?	☐	☐	☐
Are all stockpiled materials (e.g. sand, cement) contained, covered or able to be wetted down?	☐	☐	☐

Checklist item	Yes	No	N/A
Track out			
Are water-assisted dust sweeper(s) used on access and local roads, to remove any material tracked out of the site?	☐	☐	☐
Are vehicles entering and leaving the site covered to prevent escape of materials during transport?	☐	☐	☐
Is there a wheel washing system or rumble grids in place for vehicles that are leaving the site?	☐	☐	☐
Is dirty water replaced regularly in the wheel wash?	☐	☐	☐
Is there hard-surfaced road between the wheel wash facility and the site exit?	☐	☐	☐
Are access gates located at least 10 m from receptors?	☐	☐	☐

Dust event diary

Event details		
Site name		
Location		
Date		
Time		
Diary conducted by		
Is there visible dust?		
If yes, what is the source?		
What is the wind speed and wind direction from the on-site station?		
Particulate matter concentrations	**PM_{10}**	**$PM_{2.5}$**
What are PM measurements upwind?		
What are PM measurements downwind?		
Is the rolling 1-hour average increasing? (Y/N)		
What is the difference? (downwind – upwind)		
What are the concentrations at the nearest DCCEEW* monitoring station?		
Actions		
What actions have been taken to reduce dust?		
Were the actions effective? (Y/N and explanation, e.g. reduction in the rolling 1-hour average)		

* NSW Department of Climate Change, Energy, the Environment and Water

2.2 Spray painting and surface coatings activities

The checklist below has been prepared for spray painting and surface coating operations, which typically include auto repair shops, boat builders and repairers and metal fabricators. The checklist should be scrutinised prior to the inspection to be aware, in advance, of key factors and risks to be identified during the site visit.

The following supporting documentation included in the Local Government Air Quality Toolkit can be used in conjunction with the checklist:

- *Composite structural products guidance note*
- *Spray painting and surface coating operations guidance note*
- *Auto repair shops visual guide*.

Spray painting and surface coating activity inspection checklist

Inspection details	
Site name	
Location	
Date of inspection	
Time of inspection	
Type of activity	
Attendees at inspection (council and site personnel)	

Checklist item	Yes	No	N/A
General			
Are responsible personnel at the site?	☐	☐	☐
Is the extraction system designed and operated according to Australian Standard AS 4114:2020?	☐	☐	☐
Extraction booth			
Is the booth a down-flow arrangement?	☐	☐	☐
Is the booth a cross-flow arrangement?	☐	☐	☐
Is the booth under negative pressure?	☐	☐	☐
Is organic solvent evaporation occurring in ventilated booths?	☐	☐	☐
Do the doors close tightly during operation?	☐	☐	☐
Is there adequate draft through any openings in the booth (e.g. 0.5 m/s minimum across any open face)?	☐	☐	☐
Filter			
Is sanding and surface preparation carried out in booths with filtered or scrubbed exhausts?	☐	☐	☐
Is the filter clogged or overloaded?	☐	☐	☐
Is the filter cleaned or replaced regularly?	☐	☐	☐
Are there any gaps around the filter medium?	☐	☐	☐

Checklist item	Yes	No	N/A
Pressure			
Is there a pressure gauge located external to the spray booth?	☐	☐	☐
Is the pressure drop across the booth and filter greater than 60 Pa? (This may indicate filters are clogged and require changing.)	☐	☐	☐
Spray guns			
Is clean-up of spray guns and equipment done in a controlled space?	☐	☐	☐
Are the spray guns standard pressure, high-volume low-pressure (HVLP) or electrostatic? (circle answer)			
Waste disposal			
Are spent solvents disposed of by licensed waste contractors?	☐	☐	☐
Are spent solvents held in closed systems for disposal, and not exposed for evaporation?	☐	☐	☐
Stacks			
Are discharge stacks designed according to Australian Standard AS 4114:2020, with a stack height at least 3 m above the highest point of the roofline?	☐	☐	☐
Does the stack have a rain cap?	☐	☐	☐
Are the stacks high enough so that dispersion is not impeded by downwash from buildings or by other tall objects such as trees acting as wind barriers?	☐	☐	☐
Is the vertical discharge between 10 and 15 m/s?	☐	☐	☐

2.3 Odour from food outlets

The checklist below has been prepared for odour from food outlets, including restaurants, cafes, coffee roasters and craft (micro) breweries. The checklist should be scrutinised prior to the inspection to be aware, in advance, of key factors and risks to be identified during the site visit. During the site inspection(s), consideration should be given to housekeeping, management practices and processes, waste management and emission performance.

The following supporting documentation included in the Local Government Air Quality Toolkit can be used in conjunction with the checklist:

- *Food outlets guidance note*
- *Odour from food outlets visual guide*.

Odour from food outlet inspection checklist

Inspection details	
Site name	
Location	
Date of inspection	
Time of inspection	
Type of activity (restaurant/café/coffee roaster/craft brewery)	
Attendees at inspection (council and site personnel)	

Checklist item	Yes	No	N/A
General			
Are responsible personnel at the site?	☐	☐	☐
Housekeeping			
Is there a housekeeping protocol or program in place?	☐	☐	☐
Is the protocol or program sufficiently detailed?	☐	☐	☐
Does the housekeeping program include appropriate actions to be undertaken?	☐	☐	☐
Practices and processes			
Are some access doorways on buildings left open during certain activities?	☐	☐	☐
Are problem sources of odour being appropriately managed?	☐	☐	☐
Is wind direction and time of day considered when cooking/ brewing/ roasting is taking place?	☐	☐	☐
Is the management taking steps to contain or reduce emissions such as odour?	☐	☐	☐
Extraction system and stack			
Are dust and grease particles being extracted via collection systems and treated (e.g. by using a simple grit arrestor or grease trap)?	☐	☐	☐

Checklist item	Yes	No	N/A
Is there a maintenance program for these?	☐	☐	☐
Is the exhaust hood fully effective?	☐	☐	☐
Are some cooking operations being done without an exhaust hood, or outside the effective range of a hood?	☐	☐	☐
Are discharge stacks designed according to Australian Standard AS 4114:2020, with a stack height at least 3 m above the highest point of the roofline?	☐	☐	☐
Does the stack have a rain cap?	☐	☐	☐
Are the stacks high enough so that dispersion is not impeded by downwash from buildings or by other tall objects such as trees acting as wind barriers?	☐	☐	☐

2.4 Smoke from wood heaters and backyard burning

The checklists below have been prepared for smoke from wood heaters and backyard burning. The checklists should be scrutinised prior to the inspection to be aware, in advance, of key things to be identified during the site visit.

The onus is on the owner not to allow visible smoke to impact sensitive locations downwind. If an authorised officer is of the opinion that air pollution from the fire is injurious to health or causing or is likely to cause serious discomfort or inconvenience, to any person, the operator may be required to extinguish the fire and to not light or maintain a similar fire at a premises for a period of up to 48 hours (POEO Act s 134).

The Local Government Air Quality Toolkit *Neighbourhood smoke guidance note* can be used in conjunction with the checklist. Module 2, *Legislative and policy framework for air quality management* provides information on excessive smoke, and regulatory options for domestic woodsmoke.

Smoke from wood heaters inspection checklist

Inspection details	
Address	
Date of inspection	
Time of inspection	
Type of wood heater	
Attendees at inspection (council and member of the public)	

Checklist item	Yes	No	N/A
Wood heaters/smoky chimneys			
What material is being burnt?	☐	☐	☐
If wood, is the wood dry, aged and untreated?	☐	☐	☐
Is the material being burnt household waste?	☐	☐	☐
Have complaints been received?	☐	☐	☐
Has the chimney been cleaned in the last 12 months?	☐	☐	☐
Does the solid fuel heater have a certificate of compliance certifying that the heater model has been tested in accordance with Australian Standard AS/NZS 4013:2014 *Domestic solid fuel burning appliances – Method for determination of flue gas emission* and Australian Standard AS/NZS 4012:2014 *Domestic solid fuel burning appliances – Method for determination of power output and efficiency*?	☐	☐	☐
Excessive smoke			
Can a visible plume of smoke from a chimney be seen for a continuous period of not less than 10 minutes?	☐	☐	☐
Does the plume extend at least 10 m from the point at which the smoke is emitted from the chimney for a period of 30 seconds or more?	☐	☐	☐

Smoke from backyard burning inspection checklist

Inspection details	
Address	
Date of inspection	
Time of inspection	
Brief description of activity	
Attendees at inspection (council and member of the public)	

Checklist item	Yes	No	N/A
Backyard burning			
What material is being burnt?	☐	☐	☐
If wood, is the wood dry, aged and untreated?	☐	☐	☐
Is the material being burnt household waste?	☐	☐	☐
Have complaints been received?	☐	☐	☐
Has the fire been smouldering overnight?	☐	☐	☐
Is the backyard burning occurring within proximity of another residential property or sensitive receiver?	☐	☐	☐
Has wind direction been considered prior to burning?	☐	☐	☐
Have other weather conditions been considered prior to burning?	☐	☐	☐
Are the burn piles excessively large?	☐	☐	☐
Is there currently a no-burn order in place for this local district?	☐	☐	☐
Has a total fire ban day been declared for this region?	☐	☐	☐

2.5 Agricultural burning

The checklist below has been prepared for agricultural burning. The checklist should be scrutinised prior to the inspection to be aware, in advance, of key things to be identified during the site visit.

The onus is on the owner not to allow visible smoke to impact sensitive sites. If it is seen or reported to be seen, or justifiable complaints are being received, the operator may be required to extinguish the fire.

The Local Government Air Quality Toolkit *Agricultural burning guidance note* can be used in conjunction with the checklist.

Agricultural burning inspection checklist

Inspection details
Address
Date of inspection
Time of inspection
Brief description of activity
Attendees at inspection (council and site personnel)

Checklist item	Yes	No	N/A
General			
Is the material being burnt wet?	☐	☐	☐
Is the material suitable to be burnt?	☐	☐	☐
Has the owner or operator of the property identified all sensitive sites in their area (e.g. schools, daycare centres, hospitals, aged care facilities)?	☐	☐	☐
Has the owner or operator of the property checked the weather forecast to ensure the wind direction will not be in the direction of these sites for the period of the burn?	☐	☐	☐
Have all the local neighbours been notified of the burn? (Neighbours may include public land managers such as the National Parks and Wildlife Service, Forestry Corporation of NSW or the Sydney Catchment Authority, as well as private landowners, Crown Lands and Transport for NSW.)	☐	☐	☐
Are there any neighbouring areas that are also about to be burnt?	☐	☐	☐
Has the local fire authority been notified?	☐	☐	☐
Does the local council require a permit, and if so, has this been issued (e.g. if burning during a designated fire danger period, or within the jurisdiction of FRNSW or the RFS*).	☐	☐	☐
Is there currently a no-burn order in place for this local district?	☐	☐	☐
Has a total fire ban day been declared for this region?	☐	☐	☐
Can the land occupier demonstrate that all recommended steps have been taken to ensure the fire will not go beyond the site boundary?	☐	☐	☐
Where a boundary is adjacent to Crown land (e.g. a forest or reserve), are extra supervisory conditions required, and is the operator aware of their responsibility to ensure their fire does not enter Crown land?	☐	☐	☐

* FRNSW = Fire and Rescue NSW, RFS = Rural Fire Service

3. Investigating complaints

3.1 Odour complaints

The first indication of an air pollution issue often comes from complaints by the public. Most councils have a system for logging, documenting and following up complaints. A complaint from a member of the public is considered as valuable intelligence.

Odour complaints are probably the most common to be encountered and are often made at night. A systematic approach should be followed in any investigation, including recording of information. A site visit to the location and the suspected odorous premises is likely to lead to the source and often the cause of the problem. The EPA *Guide to conducting field odour surveys* may be useful when investigating an odour complaint (EPA 2021).

This section provides the following:

- odour intensity descriptors (Table 1)
- odour presence descriptors (Table 2)
- odour complaint checklist
- odour wheel for describing odour (Figure 1)
- odour diary template
- odour survey template.

Odour intensity

The odour intensity is based on how easy it is to recognise an odour. The criteria to be used for determining odour intensity are provided in Table 1.

Table 1 **Odour intensity**
Source: EPA VIC (2022)

Descriptor	Description
Obvious (O)	Odour is easily recognised, can be described and may be attributed to a source The assessor can smell it without any effort or focus on it
Subtle (S)	Odour can be recognised only when focusing; for example, by standing still, inhaling slowly and concentrating
No odour (N)	No odour, or odour is not strong enough to be recognised

Odour presence

Odour presence is the proportion of time during a single odour observation that the odour is recognised. When making observations of odour intensity, it is likely the odour intensity will vary. Odour presence descriptors are provided in Table 2.

Table 2 **Odour presence descriptors**

Source: EPA VIC (2022)

Descriptor	Rating	Description of odour presence
Constant	C	Can smell it constantly or almost constantly (>80% of the time)
Frequent / repetitive	F	On and off extended periods with recognised odour (10–80% of the time)
Transient	T	On and off with significant periods with no odour or no recognised odour (<10% of the time)

Odour complaint checklist

The checklist below has been prepared to provide a step-by-step response to an odour complaint.

Odour wheel

When conducting an odour survey, it is important to describe the odour clearly. An odour wheel taken from Environment Protection Authority Victoria's *F1090: Odour diary* template (EPA VIC 2021), is provided in Figure 1 and together with the common industrial odour descriptors, it can be used by both council officers during odour surveys and residents when describing odour and including this as part of the odour diary.

Odour diary

An odour diary template has been provided, adapted from EPA VIC's *F1090: Odour diary* template (EPA VIC 2021). The odour diary is typically something that is completed by residents to keep a record of odour events and this can be provided to local council officers to assist with any odour issues or upcoming site inspections.

Odour survey

An odour survey template has been provided that can be used by local council officers.

Odour complaint checklist

Complaint details	
Address of complainant	
Address of suspected source of complaint	
Date of inspection	
Time of inspection	
Type of activity (craft brewery, restaurant, industry, agriculture)	
Checklist completed by	

ID	Item	Complete (Y/N/NA)	Comment
1	Phone the complainant to confirm the details of the complaint (some discretion is warranted if it is late at night).		
2	Identify whether the pollution is likely to be from an ongoing problem source where the status is known and corrective action is in hand. If so, call the complainant back to let them know this is the case.		
3	If the problem is new, or the complaint appears to add a new dimension to a known problem (e.g. 10 complaints received in 30 minutes about a problem that normally results in one complaint a month), then undertake a field investigation as soon as possible.		

ID	Item	Complete (Y/N/NA)	Comment
4	Drive to the location of the complainant equipped with a map, camera, a torch (if at night) and identification/authorisation card or badge.		
5	Try to detect the odour in the general locality (the wind direction may have shifted since the complaint). Note the following for each observation:		
	• location of detection (map, coordinates)		
	• time of detection		
	• type of odour by description or identification (use odour wheel below)		
	• odour intensity (circle one of: obvious, subtle, no odour)		
	• odour presence (circle one of: constant, frequent/repetitive, transient)		
	• estimate of wind speed (circle one below) (no wind, slight, moderate, strong, stormy)		
	• estimate of wind direction (circle one below) (N, NNE, NE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW, NNW).		
6	Complete several traverses of the likely odour plume at different distances downwind from the suspected source. This can effectively confirm the direction of a plume.		
7	Travel to a position upwind of the suspected source and, using a traverse across the probable plume direction, establish that the odour is not present. If it is present, and the wind direction has not shifted, then the suspected source has been wrongly identified.		

ID	Item	Complete (Y/N/NA)	Comment
8	Proceed to the suspected source and, if deemed necessary, seek to gain entry under the powers of an authorised officer. Make sure any council procedures and guidelines for inspections are followed.		
9	Identify yourself, indicate the legal authority and the nature of the investigation. Authorised officers' training provides guidance about the legal requirements here. It is an offence to hinder an authorised officer by refusing access while investigating such a situation, where it is reasonable to suspect the subject premises of being the cause of the odour.		
10	Identify the representative of the organisation and their authority, preferably the manager or supervisor on duty. Ask them the possible reason for the reported odours. Inspect the relevant parts of the process and equipment, as advised by the manager or supervisor, as well as any parts you suspect may be the cause of the problem. Things to investigate include:		
	• spills		
	• accidents (e.g. drums dropped while handling)		
	• visible discharges from vents		
	• any visible evidence of deposition		
	• process problems or abnormal operations		
	• new materials or procedures		

ID	Item	Complete (Y/N/NA)	Comment
	• large, exposed surfaces of odorous liquid, soil or other material		
	• control equipment with monitoring/operating/maintenance records (e.g. scrubbers, adsorbers, fume incinerators).		
12	Advise the organisational representative to take corrective action and note their response A local council authorised officer should ensure that any specific action required to be carried out by the organisation is in the form of a direction in a clean-up or prevention notice (e.g. issued under the POEO Act). If an officer gives a direction, they must have a statutory basis on which to do so.		
13	Advise that there will be a follow-up interview and discussion with the organisation's management at an arranged time.		
14	Document actions according to council policy and procedure.		

Odour wheel

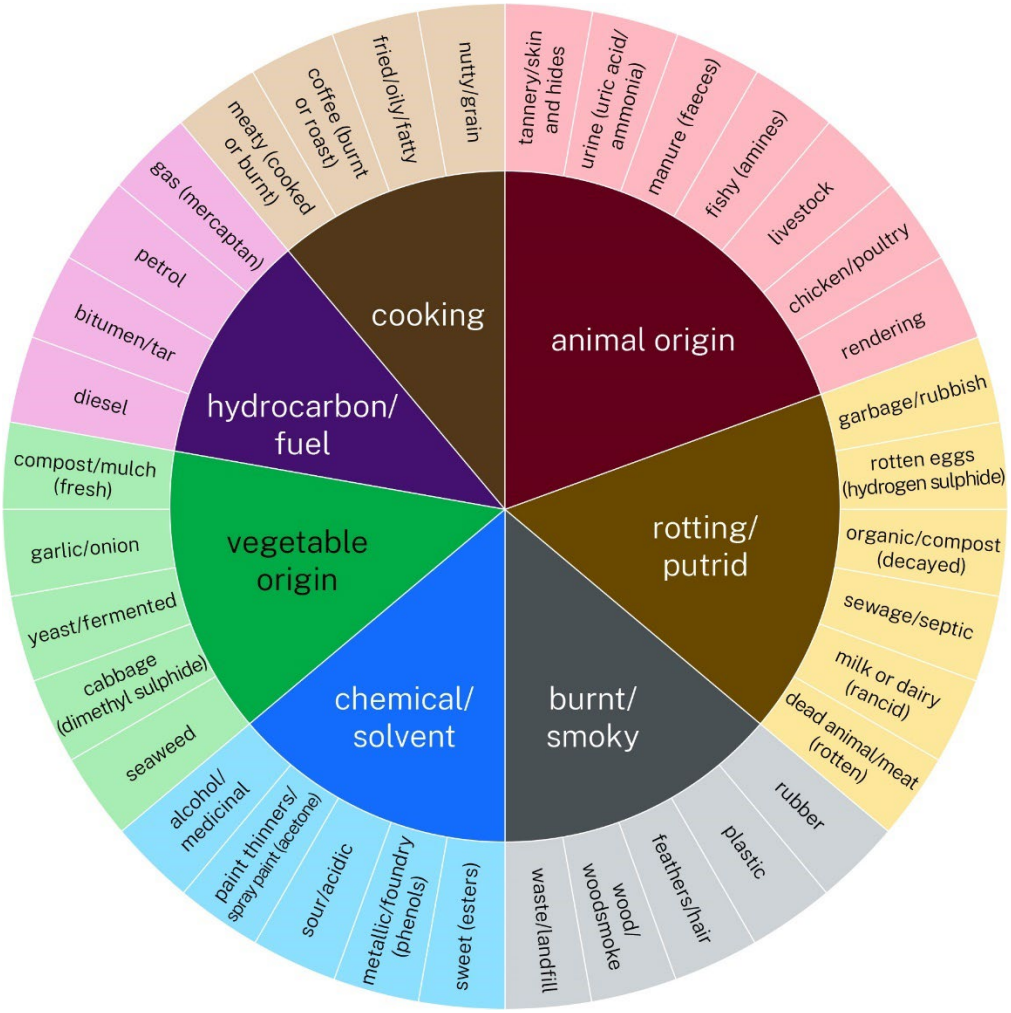

Figure 1 **Odour wheel**
Source: VIC EPA (2021)

Common industrial odour descriptors

01 Fragrant/perfume
02 Nut roasting
03 Sweet
04 Fruity
05 Bakery
06 Coffee-like
07 Spicy
08 Meaty (cooked)
09 Raw meat, blood-like
10 Herbal, green, cut grass
11 Cooked vegetables
12 Garlic, onion
13 Sea/marine
14 Fishy – fresh or rotten
15 Woody, resinous
16 Burnt, smoky
17 Medicinal, ether-like, anaesthetic
18 Chemicals
19 Fibreglass resin-like styrene
20 Paint-like
21 Petrol, diesel, kerosene, solvents
22 Ammonia/urine
23 Rotten egg, sulphurous
24 Gas-like (methylmercaptans)
25 Tar-like
26 Metallic
27 Oil, fatty
28 Sour, acrid, vinegar
29 Silage
30 Compost
31 Musty, earthy, mouldy
32 Rubbish
33 Rancid
34 Putrid, foul decaying, vomit
35 Dead animal
36 Manure
37 Sewage, septic
38 Other (describe)

Source: VIC EPA (2021)

Odour diary

Odour event details
Name of observer
Location of observation (work or home address)
Odour first noticed (date)
Odour first noticed (time)
Odour intensity
Odour description What did/does the odour smell like? (use the odour wheel and/or industrial odour descriptors) Was it consistently present? (use odour descriptors table) How long did it last?

Odour survey

Date: _____ Name of assessor: _____

GPS coordinates: X _____ Y _____ Start time: _____

Time	Intensity[1]	Source/character[2]	Time	Intensity[1]	Source/character[2]
0:10			5:10		
0:20			5:20		
0:30			5:30		
0:40			5:40		
0:50			5:50		
1:00			6:00		
1:10			6:10		
1:20			6:20		
1:30			6:30		
1:40			6:40		
1:50			6:50		
2:00			7:00		
2:10			7:10		
2:20			7:20		
2:30			7:30		
2:40			7:40		
2:50			7:50		
3:00			8:00		
3:10			8:10		
3:20			8:20		
3:30			8:30		
3:40			8:40		
3:50			8:50		
4:00			9:00		
4:10			9:10		
4:20			9:20		
4:30			9:30		
4:40			9:40		
4:50			9:50		
5:00			10:00		

[1] Intensity – obvious, subtle or no odour

[2] Source/character – use the odour wheel and/or industrial odour descriptors

Odour survey, continued

Weather data (circle)				
Wind strength:				
no wind	slight	moderate	strong	stormy
Cloud cover:				
none	light	moderate	heavy	
Precipitation:				
none	drizzle	rain	mist	other

Indicate direction wind was blowing from

At start of survey:

At end of survey:

Notes

3.2 Fallout (dust deposition) and other complaints

To address fallout (dust deposition) complaints, a few different techniques are useful. Fallout complaints will often occur during daytime and often during windy weather. The pattern of complaint response is like that for odours, although the response can be less urgent because fallout evidence remains in place for a while.

Fallout (dust deposition) or other complaint

Complaint details	
Address of complainant	
Address of suspected source of complaint	
Date of inspection	
Time of inspection	
Type of activity	
Checklist completed by	

ID	Item	Complete (Y/N/NA)	Comment
1	Establish whether the complaint fits a wider pattern from a known problem. If so, advise the complainant of the action in hand to correct the problem.		
2	If it is a new issue, note the pattern of complaints and mark them on a map to establish whether they point to a likely source or sources.		
3	Visit the complainant and inspect the fallout at the complainant's place.		
4	Features to note in air pollution fallout cases include:		
	• appearance and characteristics (e.g. black oily spots, waxy spots, brown staining on concrete, gritty material, powder, sooty smudges, damage caused to surfaces such as paintwork and car bodywork, any odour associated with the fallout)		

ID	Item	Complete (Y/N/NA)	Comment
	• size (e.g. large lumps, fine powder, tiny stains)		
	• patterns of deposition (e.g. most intense on vertical surfaces facing a particular direction, only on horizontal surfaces, contained within condensation droplet stains).		
5	If possible, take a sample of the fallout and store in a prepared sample container. Take multiple photos from different angles to capture the extent, appearance and characteristics of the fallout.		
6	Look for fallout on surfaces at other places in the vicinity (e.g. on parked cars or horizontal surfaces such as paths, fences, windowsills).		
7	If a pattern emerges or there is a suspected factory or business involved, proceed to an inspection of the premises as described for odour investigations.		
8	Consult the authorised officers' training materials (or any guidelines on the exercise of authorised officer powers) for the legal and administrative procedures to be followed in the inspection. Ensure any council procedures and guidelines for inspections are followed.		
9	Identify the representative of the organisation and their authority, preferably the manager or supervisor on duty. Ask them the possible reason for the reported emissions.		
10	Inspect the relevant parts of the process and equipment, as advised by the manager or supervisor, as well as any parts you suspect may be the cause of the problem. Things to investigate include:		
	• stacks discharging visible emissions		

ID	Item	Complete (Y/N/NA)	Comment
	• large, exposed surfaces of loose or unconsolidated materials		
	• land clearing in progress		
	• dusty roads or yards and poor housekeeping		
	• staining or markings around stack tips or on roofs in which stacks are located		
	• evidence on the premises of fallout similar to the complaint		
	• process problems or abnormal operations		
	• new materials or procedures		
	• particulate control equipment with monitoring/operating/maintenance records (e.g. scrubbers, fabric filters, inertial separators, watering carts, road sweepers).		
11	Advise the organisational representative to take corrective action and note their response. A local council authorised officer should ensure that any specific action required to be carried out by the organisation is in the form of a direction in a clean-up or prevention notice (e.g. issued under the POEO Act). If an officer gives a direction, they must have a statutory basis on which to do so.		
13	Advise that there will be a follow-up interview and discussion with the organisation's management at an arranged time.		
14	Document actions according to council policy and procedure.		

4. Systematic investigations

A systematic approach to investigations initiated by council officers might involve the steps in the checklist below.

Systematic investigations checklist

Checklist item	Yes/No/NA	Comment
Has a review been undertaken of the background of the premises and operations, using sources such as council files?		
Is the type of activity and likely air pollution problems from the source understood? Sources to use include: • this Local Government Air Quality Toolkit • EPA website • web searches on processes involved, environmental problems typically encountered and suppliers of air pollution control equipment • information from colleagues working for council or for other councils that have had similar problems • benchmarking; that is, comparison with best-practice performance in similar industries.		
Have the types of controls been considered that might be employed to overcome the problems, as suggested in the Local Government Air Quality Toolkit?		
Has a review been completed for options for control with the business involved or an industry organisation? Aspects to be aware of during this review process include: • multiple meetings and systematic inspections with expert consultants and advisers attending on behalf of the management		

Checklist item	Yes/No/NA	Comment
• most businesses and industries have been educated to acknowledge their environmental responsibilities. A reluctant operator can usually be engaged in the process using various means available to local council officers to achieve cooperation • management may claim that the complaints or problems have arisen from a short-term or one-off change in operations and that normality has 'now been restored'. This may be the case, but other possibilities should be explored, and records checked for confirmation.		
Have more solutions been explored, if management accepts that a problem does exist? Options generated by management will tend to start with low-cost, low-difficulty solutions. These should be examined carefully (e.g. a proposal to deal with food odour by using simple water sprays should be questioned and the management should be persuaded to be more realistic).		
Has the choice of solutions led to issue of a prevention notice or clean-up notice under the *Protection of the Environment Operations Act 1997* (POEO Act) or to an application to modify development consent conditions? Documentation about the proposed solutions should include: • benchmarks for progress • firm completion and commissioning dates • monitored or otherwise measurable performance outcomes. The solution should include an audit process, to be carried out some time after completion of the works required, to make sure a real solution has been achieved. (In relatively straightforward cases this may not be necessary.)		

5. Deciding on a course of action

The following checklist assists councils when deciding which regulatory tool to apply.

Checklist item	Yes	No	N/A
Is the council the appropriate regulatory authority (ARA), and is the investigating officer an authorised officer under the relevant legislation?	☐	☐	☐
Is it a complex air pollution problem (e.g. one with more than one type of pollutant being emitted)?	☐	☐	☐
Can the problem be easily remedied (e.g. by extinguishing a fire)?	☐	☐	☐
Is work required to reduce or avoid air pollution (e.g. the installation of new equipment)?	☐	☐	☐
Do measurements of air pollutant / odour emissions need to be taken or can the authorised officer assess the air pollution without testing?	☐	☐	☐
Does council have, or can it obtain, the expertise and equipment to take air emission measurements?	☐	☐	☐
Is it possible to set an achievable emissions limit that should be met?	☐	☐	☐
Is it more appropriate to require best management practices to be adopted to minimise air pollution?	☐	☐	☐
Does the ARA have enough evidence to issue a notice, and to defend any appeal against a notice in court?	☐	☐	☐
If a penalty notice is to be issued by an officer, is the officer authorised to issue the penalty notice under the relevant legislation?	☐	☐	☐
Is a penalty notice appropriate in the circumstances? Will a fine act as a deterrent?	☐	☐	☐
Will council be able to determine compliance with any notice served? (A notice may include directions that the ARA be notified of actions taken under the notice.)	☐	☐	☐

6. Consultants and assessment of dispersion modelling

There are a few important aspects for local government to consider when overseeing external consultants' air quality assessment and dispersion modelling studies, to ensure the best outcome is achieved.

This chapter includes:

- tips for checking credentials and experience of nominated consultants
- typical questions to ask consultants
- an assessment and dispersion modelling checklist.

For odour issues, it should be noted that dispersion modelling is useful during the development and approvals stage and when considering future mitigation options. Once an agricultural facility is operational, odour surveys can be a more useful tool for addressing potential for odour impacts. Odour surveys are provided in Chapter 3 of this resource pack.

6.1 Checking credentials and experience

- Most consultants are required to include a curriculum vitae (CV) in their reports, giving their:
  - qualifications
  - experience
  - referees for previous work.
- Some professional bodies operate accreditation and registration schemes for their members in the areas of their expertise; for example:
  - the Clean Air Society of Australia and New Zealand (CASANZ) maintains the Certified Air Quality Professional (CAQP) accreditation scheme
  - the Environment Institute of Australia and New Zealand (EIANZ) maintains the Certified Environmental Practitioner (CEnvP) accreditation scheme
  - Engineers Australia.
- Some jurisdictions require government registration of consultants for specific purposes, but in New South Wales this does not apply to air quality.

CAQP accreditation, initiated by CASANZ, is particularly relevant to air assessments, and it is recommended that councils require that work be carried out by individuals who hold this accreditation.

6.2 Questions to ask

Council officers should not hesitate to ask consultants critical questions; for example:

- dispersion modellers could be asked about the extent of their experience and how their previous predictions have performed against monitored results, where these have been available
- council can request justification for the dispersion models being proposed, as well as demonstration of where such models have been applied in similar situations

- when considering modelling reports, some simple common-sense checks can be used to gauge whether the consultant's assumptions about topography and building heights conform with the officer's observations (see the checklist below for further items to review)
- if consultants have industry-specific expertise, they can be asked about their expertise in relation to the air pollution control equipment they are recommending
- referees and previous clients can and should be contacted to gather feedback on a consultant's experience.

Consultants can make an invaluable contribution to environmental decision-making by bringing a high level of training and extensive, accumulated experience and knowledge to specific tasks. Usually, only academics and specialised government experts will have comparable experience and expertise.

Assessment and dispersion modelling checklist

Assessment and dispersion modelling details	
Site name and location	
Date of assessment and modelling review	
Reviewed by (council officer)	
Work prepared by (consultant name)	

Checklist item	Yes	No	N/A
General			
Have the consultants demonstrated competency and experience in air quality assessment and dispersion modelling?	☐	☐	☐
Are the consultants Certified Air Quality Professionals (CAQP)?	☐	☐	☐
Does the report make reference to and comply with the *Approved methods for modelling and assessment of air pollutants in New South Wales* (EPA 2022)?	☐	☐	☐
For odour, does the report consider the:			
• *Technical Framework: Assessment and management of odours from stationary sources in NSW* (DEC 2006a)	☐	☐	☐
• *Technical Notes: Assessment and management of odours from stationary sources in NSW* (DEC 2006b)?	☐	☐	☐
Project description and scenarios			
Has the project been defined?	☐	☐	☐
Has a worst-case operational scenario been defined and assessed?	☐	☐	☐
Assessment criteria			
Have impact assessment criteria from the *Approved methods for modelling and assessment of air pollutants in New South Wales* (EPA 2022) been used?	☐	☐	☐
Have criteria been provided for relevant pollutants and averaging periods?	☐	☐	☐

Checklist item	Yes	No	N/A
Existing environment			
Has a BoM or DCCEEW weather station been referenced for meteorological parameters?	☐	☐	☐
Has the TAPM or WRF meteorological model been used to provide some or all of the meteorological parameters?	☐	☐	☐
Have 5 years of meteorological data been reviewed and evaluated to select a representative meteorological year?	☐	☐	☐
Has sufficient justification been provided to determine a representative year?	☐	☐	☐
Has a DCCEEW monitoring station (or other nearby monitoring site) been used to estimate background air quality parameters?	☐	☐	☐
Has sufficient justification been provided to determine a representative year?	☐	☐	☐
Has sufficient justification been provided for the choice of monitoring station for estimation of background concentrations?	☐	☐	☐
For particulates (PM_{10} and $PM_{2.5}$), have all exceedance days been included in the data?	☐	☐	☐
Modelling			
Which of the following dispersion models have been used? (see the Local Government Air Quality Toolkit – Module 1 for guidance on which models are appropriate for the industry and location being assessed)			
• Calpuff	☐	☐	☐
• AERMOD	☐	☐	☐
• CALINE	☐	☐	☐
• TRAQ	☐	☐	☐
• Ausplume (the use of this model should be queried, refer to Module 1)	☐	☐	☐
• GRAL (the use of this model should be queried, refer to Module 1)	☐	☐	☐
Are assumptions/limitations and uncertainties of the modelling provided?	☐	☐	☐
Do the surroundings complicate the dispersion modelling? For example:			

Checklist item	Yes	No	N/A
• Is the facility in a narrow valley or influenced by some other terrain feature?	☐	☐	☐
• Are high buildings or clumps of high trees in proximity?	☐	☐	☐
• Is steeply rising land nearby?	☐	☐	☐
Are there several point / stack sources that may need to be optimised to determine the most effective dispersion?	☐	☐	☐
Are the building heights used accurate?	☐	☐	☐
Odour sampling			
Was the odour emission testing at source completed by a suitably qualified consultant?	☐	☐	☐
Were odour samples analysed using a laboratory with NATA accreditation for this method (according to AS/NZS 4323.3)?	☐	☐	☐
Was the odour sampling completed during representative operating conditions?	☐	☐	☐
Are these representative conditions likely to vary over time?	☐	☐	☐
Are there other odour sources that may have been missed in the sampling?	☐	☐	☐
Emission estimation			
Have all emission sources been identified?	☐	☐	☐
Have all equations, tables and figures been provided for review of emission sources?	☐	☐	☐
Has the consultant referred to National Pollutant Inventory emission estimation technique manuals (Aust. DCCEEW 2023) and/or *AP-42: Compilation of air emissions factors from stationary sources* (US EPA 2024)?	☐	☐	☐
Mitigation measures			
Have mitigation measures been provided with proposed percentage control efficiencies?	☐	☐	☐
Have all reasonable measures been adopted to minimise emissions?	☐	☐	☐

Checklist item	Yes	No	N/A
Is the control equipment suitable for achieving the predicted emissions? (e.g. low-efficiency cyclones or low-energy scrubbers are not usually adequate for collecting fine particles; and food processing odours are unlikely to be removed by wet scrubbing) The cross-reference tables and the descriptions of air pollution control techniques contained in the Local Government Air Quality Toolkit – Module 3 and Module 4 can provide further guidance.	☐	☐	☐
Is the management likely to have the capability to operate and monitor any complex control equipment proposed?	☐	☐	☐
Is adequate monitoring for performance assessment proposed or required?	☐	☐	☐
Has a management plan for the site been proposed?	☐	☐	☐
Impact assessment			
Have results tables and contour plots been provided?	☐	☐	☐
Are all results compared with assessment criteria?	☐	☐	☐

Notes: DCCEEW = NSW Department of Climate Change, Energy, the Environment and Water, BoM = Bureau of Meteorology, TAPM = The Air Pollution Model, WRF = Weather Research and Forecasting Model

7. Operational and control recommendations

Each of the Local Government Air Quality Toolkit guidance notes has a section on operational and control recommendations. This chapter of the resource pack provides operational and control measures that are helpful in reducing air emissions and impacts for the following:

- 7.1 Beef cattle feedlots
- 7.2 Composite structural products
- 7.3 Construction sites
- 7.4 Dairies
- 7.5 Egg production facilities
- 7.6 Food outlets
- 7.7 Meat chicken production facilities
- 7.8 Piggeries
- 7.9 Sawmills
- 7.10 Spray painting and surface coating operations.

These measures can be used as a basis for preparing consent conditions for these industries.

Template consent conditions have not been drafted as part of the guidelines for each industry. Many councils have developed their own formats and style of drafting for consent conditions. It is not appropriate to attempt to match these in general guidelines and each consent condition should be site-specific.

7.1 Beef cattle feedlots

- Odours from the premises should not be detectable at the nearest sensitive land use.
- All operations and activities occurring at the feedlot should be carried out in a manner that will minimise dust at the boundary of the premises.
- All feedlot pens should have adequate slope, a hard surface and should shed water directly to a drain.
- All feedlot pens should be cleaned regularly, including under fences.
- All feedlot pens should be checked after cleaning to make sure the surface is hard and even.
- All feedlot drains should have adequate slope so solids do not settle in the drain, and hard surfaces to prevent scouring.
- The sedimentation basin should have adequate surface area so inflowing runoff ponds as a shallow layer.
- The sedimentation basin should be maintained so there is always adequate capacity for settling solids from inflow events.
- Holding ponds should be maintained so sedimentation does not reduce their capacity by more than the designed sludge capacity.
- Solids storage areas should have impervious, free-draining surfaces.
- All solid by-products (e.g. manure, settled solids, spent bedding, sludge) should be stored in an impervious, free-draining, bunded area.
- Solids should be stored as far away from sensitive receptors as practicable.
- Wherever possible, movement of solids should be carried out in weather conditions that minimise emission of odours.
- Application of solids to land should be carried out in weather conditions that minimise odour and dust emissions and any impacts on sensitive receptors. Solids should be incorporated into soil immediately after application.
- Spray from effluent application should not be allowed to drift beyond the boundary of the premises.
- Carcasses should be disposed of in a manner that minimises odour and dust emissions.
- Carcasses that are buried should be covered with sufficient soil to prevent odour emissions.

7.2 Composite structural products

- Odours from the premises should not be detectable at the nearest sensitive land use.
- Odorous exhaust gases from process areas handling odorous materials, such as resins and solvents, should be either:
  - vented at a height that complies with the requirements set out in the EPA *Approved methods for the modelling and assessment of air pollutants in New South Wales* (EPA 2022)
  - treated by activated carbon adsorbers before the exhaust gases are discharged to the atmosphere.
- Where activated carbon adsorbers are used:
  - the ventilation system should be fitted with efficient filtration equipment to remove particles and aerosols from the exhaust before it enters the activated carbon adsorbers
  - adsorbers should be checked regularly for 'odour breakthrough' and the filter changed once breakthrough has been reached
  - spent activated carbon should be disposed of to landfills that are licensed and approved to accept this type of waste material.
- Exhaust stacks should be vented at a height clear of downwash effects from the building in which the activity is located and adjacent buildings, and a minimum of 3 m above the highest point of the building roof ridge line, or above that of any higher, adjacent building within 50 m.
- Exhaust stack gases should be vented with a design exit velocity of at least 10 m/s without any impediment to vertical discharge.
- Particles generated during the finishing processes should be captured at source and discharged to the atmosphere through fabric filters or other devices in such a way as to prevent fugitive dust emissions and control collected emissions.
- Dust collectors should be individually fitted to tools or pieces of machinery, or a centralised dust collection unit should be installed with an appropriately designed ducting and collection interface.
- Particulate collection points should be emptied on a regular basis and should be configured so as not to give rise to fugitive dust emissions.
- No visible particulate emissions should be discharged from a point source serving a baghouse.
- Cyclones, fabric filters and other dust collectors should be maintained in a proper and efficient manner at all times.
- Monitoring of control equipment should be based on:
  - extent of emissions
  - toxicity or odorous potential of emissions
  - sensitivity of the activity.
- Appropriate monitoring devices should be used, as specified in Table 6 of the Module 3 Summary tables.
- All activities, including housekeeping, should be carried out according to industry best practice.
- Hours of operation should be restricted where appropriate to ensure there are no impacts on sensitive receptors.

7.3 Construction sites

- Odours from the premises should not be detectable at the nearest sensitive land use.
- Water sprays and dust suppression surfactants should be applied during demolition and earth moving activities.
- Disturbed areas of earth should be minimised by scheduling construction activities to minimise dust entrainment.
- Disturbed earth surfaces should be kept moist until vegetation cover has been established.
- Wind breaks should be used where feasible.
- Stockpiles of building materials and earth should be kept moist or the surfaces stabilised.
- Sand blasting and grit blasting should be carried out in enclosed areas with efficient extraction ventilation discharged through fabric filters.
- Surface finishing by spray painting should not be carried out either:
  - where off-site overspray is possible
  - when wind direction and speed are such that off-site impacts are possible.
- Operations prone to generating dust should be restricted when dust emissions increase significantly and should cease when average wind speed exceeds 15 m/s.
- Special measure to suppress and contain dust should be adopted when old, lead-based paints are being removed.
- Open burning of rubbish and vegetation on site should be limited in accordance with the requirements of the Clean Air Regulation in that local government area.
- Where burning of vegetation is allowed, measures to minimise emissions, such as trench burners, should be considered as temporary control measures.
- Haulage vehicles leaving the site should pass through wheel washers.
- Unsealed roads should be routinely watered.
- Diesel equipment should be maintained in good condition and smoke emissions minimised.
- All building and chemical wastes should be disposed of in accordance with the requirements of the *Protection of the Environment Operations Act 1997* (POEO Act).
- If contaminated land is encountered during construction activities, with possible emissions of toxic or odorous vapours, the site should be re-assessed and treated as a contaminated site, as appropriate.
- Monitoring of control equipment should be assessed based on:
  - extent of emissions
  - toxicity or odorous potential of emissions
  - sensitivity of activity.
- Appropriate monitoring devices should be used, as specified in Table 6 of the Module 3 Summary tables.
- All activities, including housekeeping, should be carried out according to industry best practice.
- Hours of operation should be restricted where appropriate to ensure there are no impacts on sensitive receptors.

7.4 Dairies

- Odours from the premises should not be detectable at the nearest sensitive land use.
- All operations and activities occurring at the dairy should be carried out in a manner that will minimise dust at the boundary of the premises.
- All yard and feeding areas should have adequate slope, a hard surface and should shed water directly to a drain.
- All drains should have a hard, even surface to prevent scouring, and adequate slope so solids do not settle in the drain.
- Drains should be maintained in a dry condition.
- The sediment trap should have adequate volume to pond the inflowing effluent for slow release through a weir.
- The sediment trap should be maintained so adequate capacity is retained for settling solids from effluent inflow.
- Yard and feeding areas should be cleaned regularly, including under fences.
- Yard and feeding areas should be checked after cleaning to make sure the surface is hard and even.
- All solid by-products (e.g. manure, settled solids) should be stored in an impervious, free-draining, bunded area.
- Solids should be stored as far away from sensitive receptors as practicable.
- Movement of solids should be carried out in weather conditions that minimise emission of odours.
- Application of solids to land should be carried out in weather conditions that minimise odour and dust emissions and any impacts on sensitive receptors. Solids should be incorporated into soil immediately after application.
- Spray from effluent application should not be allowed to drift beyond the boundary of the premises.
- Carcasses should be disposed of in a manner that minimises odour and dust emissions.
- Carcasses that are buried should be covered with sufficient soil to prevent odour emissions.

7.5 Egg production facilities

- Odours from the premises should not be detectable at the nearest sensitive land use.
- All operations and activities conducted at the premises should carried out in a manner that will minimise dust at the boundary of the premises.
- All sheds should be constructed to prevent entry of water from external sources.
- Mechanical ventilation systems should be designed to exhaust shed air as far as possible from nearby receptors.
- Bedding within sheds should be maintained within the optimum moisture range to minimise odour and dust emissions.
- Removal of bedding from sheds should be carried out in weather conditions that minimise impact on sensitive receptors.
- All solid by-products (e.g. bedding litter) should be stored in an impervious, free-draining, bunded area.
- Solids should be stored as far away from sensitive receptors as practicable.
- Wherever possible, movement of solids should be carried out in weather conditions that minimise odour emissions.
- Application of solids to land should be carried out in weather conditions that minimise odour and dust emissions and impact on sensitive receptors. Solids should be incorporated into soil immediately after application.
- Carcasses should be disposed of in a manner that minimises odour and dust emissions.
- Carcasses that are buried should be covered with sufficient soil to prevent odour emissions.

7.6 Food outlets

- Odours from the premises should not be detectable at the nearest sensitive land use.
- Odour sources such as cooking areas (particularly for barbecuing chickens) should be suitably ventilated. Cooking emissions should be captured and discharged at a suitable height so as to not cause an odour nuisance.
- Odorous exhaust gases should be treated by activated carbon adsorbers before exhaust gases are discharged to the atmosphere. The ventilation system should be fitted with efficient filtration equipment to remove particles and aerosols from the cooking exhaust before it enters the activated carbon adsorbers.
- Activated carbon adsorbers should be checked regularly for odour 'breakthrough' (and the filter changed once breakthrough has been reached).
- Spent activated carbon should be disposed of to landfills that are licensed and approved to accept this type of waste material.
- Exhaust stacks should be vented at a height clear of downwash effects from the building in which the activity is located and adjacent buildings, and a minimum of 3 m above the highest point of the building roof ridge line, or above that of any higher, adjacent building within 50 m.
- Exhaust stack gases should be vented with a design exit velocity of at least 10 m/s without any impediment to vertical discharge (no rain caps, etc.).
- The particulate filtration system installed (e.g. a filter or grit arrestor in the cooking ventilation system) should be maintained in efficient working order at all times.
- The ventilation system used for collection of emissions (e.g. fume hood) should be maintained in efficient working order at all times. Material accumulated on the inside of the hood and ductwork (e.g. fats from cooking) should be checked and removed periodically.
- Grease traps installed in the cooking system should be maintained in efficient working order at all times.
- No visible particulate emissions should be discharged from an exhaust stack.
- Roads and access pathways should be watered (if unsealed) or sealed if the particulate fallout from an emission source is determined to present an environmental nuisance.
- Waste materials, including grease or fats removed from the grease trap system (if in place) should be packaged and labelled in the correct fashion, removed from the site and transported to an approved disposal site.
- Materials should enter and leave the site in enclosed containers. Open loads should be covered.
- Monitoring of control equipment should be assessed based on:
  - extent of emissions
  - toxicity or odorous potential of emissions
  - sensitivity of activity.
- Appropriate monitoring devices should be used, as specified in Table 6 in the Module 3 Summary tables.
- All activities, including housekeeping, should be carried out according to industry best practice.
- Hours of operation should be restricted where appropriate to ensure there are no impacts on sensitive receptors.

7.7 Meat chicken production facilities

- Odours from the premises should not be detectable at the nearest sensitive land use.
- All operations and activities conducted at the premises should be carried out in a manner that will minimise dust at the boundary of the premises.
- All sheds should be constructed to prevent entry of water from external sources.
- Mechanical ventilation systems should be designed to exhaust shed air as far as possible from nearby receptors.
- Bedding within sheds should be maintained within the optimum moisture range to minimise odour and dust emissions.
- Removal of bedding from sheds should be carried out in weather conditions that minimise impact on sensitive receptors.
- All solid by-products (e.g. bedding litter) should be stored in an impervious, free-draining, bunded area.
- Solids should be stored as far away from sensitive receptors as practicable.
- Wherever possible, movement of solids should be carried out in weather conditions that minimise odour emissions.
- Application of solids to land should be carried out in weather conditions that minimise odour and dust emissions and impact on sensitive receptors. Solids should be incorporated into soil immediately after application.
- Carcasses should be disposed of in a manner that minimises odour and dust emissions.
- Carcasses that are buried should be covered with sufficient soil to prevent odour emissions.

7.8 Piggeries

- Odours from the premises should not be detectable at the nearest sensitive land use.
- All operations and activities occurring at the piggery should be carried out in a manner that will minimise dust at the boundary of the premises.
- Pig sheds should be flushed regularly and cleaned regularly.
- Litter used in deep litter pig sheds should be maintained in a dry condition.
- Litter should be removed only in weather conditions that minimise impact on sensitive receptors.
- The effluent flushing system should have adequate storage volume, discharge capacity and drain slope to enable adequate cleaning of drains.
- Storage volume within effluent treatment ponds should meet the required treatment volume plus sludge storage volume.
- Holding ponds should be maintained so sedimentation does not reduce their capacity by more than the designed sludge capacity.
- Solids should be stored as far away from sensitive receptors as practicable.
- Solids storage areas should be provided with an impervious, free-draining surface.
- Wherever possible, movement of solids should be carried out in weather conditions that minimise odour emissions.
- All solid by-products (e.g. spent bedding, sludge, screened solids) should be stored in an impervious, free-draining, bunded area.
- Land application of effluent should be carried out in a manner that minimises odour emissions.
- Spray from effluent application should not be allowed to drift beyond the boundary of the premises.
- Carcasses should be disposed of in a manner that minimises odour and dust emissions.
- Carcasses that are buried should be covered with sufficient soil to prevent odour emissions.

7.9 Sawmills

- The premises should be maintained in a condition that minimises or prevents the emission of dust.
- Total dust deposition beyond the boundary of the premises should not exceed 4 g/m^2/month.
- Roads and storage areas within the boundary of the premises should be watered or sealed (or both) to minimise the emission of dust.
- All loads of wood chips and sawdust being removed from the premises should be covered effectively to control spillage.
- Except with the permission of the consent authority, sawdust or sawmill waste should not be deposited on any land, whether by way of filling or otherwise, or burnt, except in fuel burning equipment of a type approved by the consent authority.
- Any boiler or furnace using wood residues should be operated and maintained so efficient combustion occurs.
- Only dry and non-contaminated wood residues should be burnt.
- Solid particle emissions should comply with the Protection of the Environment Operations (Clean Air) Regulation 2022 for any stack discharges on the site:
  - 400 mg/m^3 for plant installed before 1 August 1997 (not for a new development consent)
  - 250 mg/m^3 for plant installed between 1 August 1997 and 1 September 2005 (not for a new development consent)
  - 100 mg/m^3 for plant installed after 1 September 2005.

  Note: Upgrades outside the Greater Metropolitan Area can operate at the original standard of 400 mg/m^3.
- Smoke emission should comply with:
  - 40% opacity for plant installed before 1 August 1997, with allowance for start-up
  - 20% opacity for plant installed after 1 August 1997, with allowance for start-up.
- Compliance testing should be considered in each situation, but it is generally not feasible for solid particles in relation to open burning and trench burning.
- Plant should be operated and maintained in a proper and efficient manner that does not cause air pollution, in accordance with ss 124 and 125 of the *Protection of the Environment Operations Act 1997* (POEO Act).
- Materials should be handled in a proper and efficient manner that does not cause air pollution, in accordance with s 126 of the POEO Act.
- Chemical odours from the premises should not be detectable at the nearest sensitive land use.
- Sawdust and other particulates generated during the processing of timber should be captured at source and transported to a hopper or other storage facility by means that prevent fugitive dust emissions. Such transfer should incorporate additional dust collection and control where required to minimise dust emissions.
- Cyclones should be used where appropriate to control and collect larger particulates.
- Baghouses or other devices should be used to control and collect fine particulates.

- Dust collectors should be individually fitted to tools or pieces of machinery, or a centralised dust collection unit should be installed with an appropriately designed ducting and collection interface.
- No visible particulate emissions should be discharged from a point source serving a baghouse.
- Cyclones, baghouses and other dust collectors should be maintained in efficient working condition at all times.
- Collection points for wood residues should be configured so as not to give rise to fugitive dust emissions and should be emptied on a regular basis.
- A level indicator should be placed in sawdust storage and receival bins or hopper discharge bays, to warn workers when the sawdust level reaches the outlet from the cyclone or baghouse discharge duct. The level indicator should be fitted with an audible or visual alarm to notify workers. This alarm should be tested regularly.
- The sawdust storage bin or hopper discharge bay should be enclosed on 3 sides, and a flexible plastic or canvas chute attached to the discharge outlet to prevent unnecessary free fall of the dust into the storage bay (or truck, if configured for truck loading).
- The floor of the sawdust storage discharge bay should be sealed.
- Wood-fired boiler or furnace systems should be configured for a constant supply of wood residue and designed for the efficient combustion of this rate of supply in terms of the size of the combustion chamber and the combustion air requirements.
- The stack serving a wood-fired boiler or furnace should have free vertical discharge and should be sufficiently high to clear the roof of the tallest building on site by at least 5 m.
- No open burning of wood wastes and residues should be allowed.
- Timber processing areas where resins and other chemicals are used should be suitably ventilated and have odorous emissions captured and discharged at a suitable height so as not to cause odour nuisance. Alternatively, activated carbon filters may be used to adsorb odours before discharge to the atmosphere.
- Where activated carbon is used, the emissions should be checked regularly to determine when ‘breakthrough’ has occurred. The carbon filter should be changed once this point has been reached. Used carbon filters should be disposed of to landfills licensed to accept such wastes.

7.10 Spray painting and surface coating operations

- Odours from the premises should not be detectable at the nearest sensitive land use.
- Odorous exhaust gases from spray painting booths, baking ovens and paint mixing areas should be either:
  - vented at a height that complies with the requirements set out in the EPA *Approved methods for the modelling and assessment of air pollutants in New South Wales* (EPA 2022)
  - treated using activated carbon adsorbers, direct thermal oxidisers or catalytic oxidisers before the exhaust gases are discharged to atmosphere; the ventilation system should be fitted with efficient filtration equipment to remove particles and aerosols from the exhaust before it enters activated carbon adsorbers.
- Activated carbon adsorbers should be checked regularly for odour 'breakthrough' (and the filter changed once breakthrough has been reached).
- Spent activated carbon should be disposed of to landfills that are licensed and approved to accept this type of waste material.
- Direct thermal oxidisers should be designed to maintain a temperature of 750°C for 0.5 seconds residence time and equipped with temperature monitoring and control.
- Exhaust stacks should be vented at a height clear of downwash effects from the building in which the activity is located and adjacent buildings and a minimum of 3 m above the highest point of the building roof ridge line or above that of any higher, adjacent building within 50 m.
- Exhaust stack gases should be vented with a design exit velocity of at least 10 m/s without any impediment to vertical discharge.
- Spray booths, filters and other control devices should be operated and maintained in accordance with the manufacturer's requirements.
- Spray booth filters should be replaced or cleaned when the negative pressure requirement of 50 Pa is compromised by more than 10 Pa (i.e. <40 Pa or >60 Pa).
- Monitoring of control equipment should be assessed based on:
  - extent of emissions
  - toxicity or odorous potential of emissions
  - sensitivity of the activity.
- Appropriate monitoring devices should be used, as specified in Table 6 of the Module 3 Summary tables.
- All activities, including housekeeping, should be carried out according to industry best practice.
- Where appropriate, hours of operation should be restricted to ensure there are no impacts on sensitive receptors.

8. References and other resources

All documents and webpages that are part of the Local Government Air Quality Toolkit are available from the EPA website.

Aust. DCCEEW (Australian Department of Climate Change, Energy, the Environment and Water) (2023) *Emission estimation technique manuals*, Australian Government Department of Climate Change, Energy, the Environment and Water, Canberra ACT, www.dcceew.gov.au/environment/protection/npi/reporting/industry-reporting-materials/emission-estimation-technique-manuals.

DEC (Department of Environment and Conservation) (2006a) *Technical Framework: Assessment and management of odour from stationary sources in NSW*, NSW Department of Environment and Conservation, Sydney South NSW, www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/20060440framework.pdf [PDF 259 KB].

DEC (2006b) *Technical Notes: Assessment and management of odour from stationary sources in NSW*, NSW Department of Environment and Conservation, Sydney South NSW, www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/20060441notes.pdf [PDF 254 KB].

EPA (Environment Protection Authority) (2021) *Guide to conducting field odour surveys*, NSW Environment Protection Authority, www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/22p3820-guide-field-odour-surveys.pdf [PDF 376 KB].

EPA (2022) *Approved methods for the modelling and assessment of air pollutants in New South Wales*, NSW Environment Protection Authority, www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/22p3963-approved-methods-for-modelling-and-assessment-of-air-pollutants.pdf [PDF 689 KB].

EPA VIC (Environment Protection Authority Victoria) (2021) *F1019: Odour diary*, Environment Protection Authority Victoria, Carlton VIC, www.epa.vic.gov.au/about-epa/publications/f1019.

EPA VIC (2022) *Guidance for assessing odour*, Environment Protection Authority Victoria, Carlton VIC, www.epa.vic.gov.au/about-epa/publications/1883.

IAQM (Institute of Air Quality Management) (2024) *Guidance on the assessment of dust from demolition and construction*, UK Institute of Air Quality Management, London UK, https://iaqm.co.uk/guidance/.

US EPA (United States Environment Protection Agency) (2024) *AP-42: Compilation of air emissions factors from stationary sources*, United States Environment Protection Agency, Washington USA, www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors-stationary-sources.