## ACT MATERIALS RECOVERY FACILITY

# ADDENDUM TO APPENDIX M AIR QUALITY IMPACT ASSESSMENT

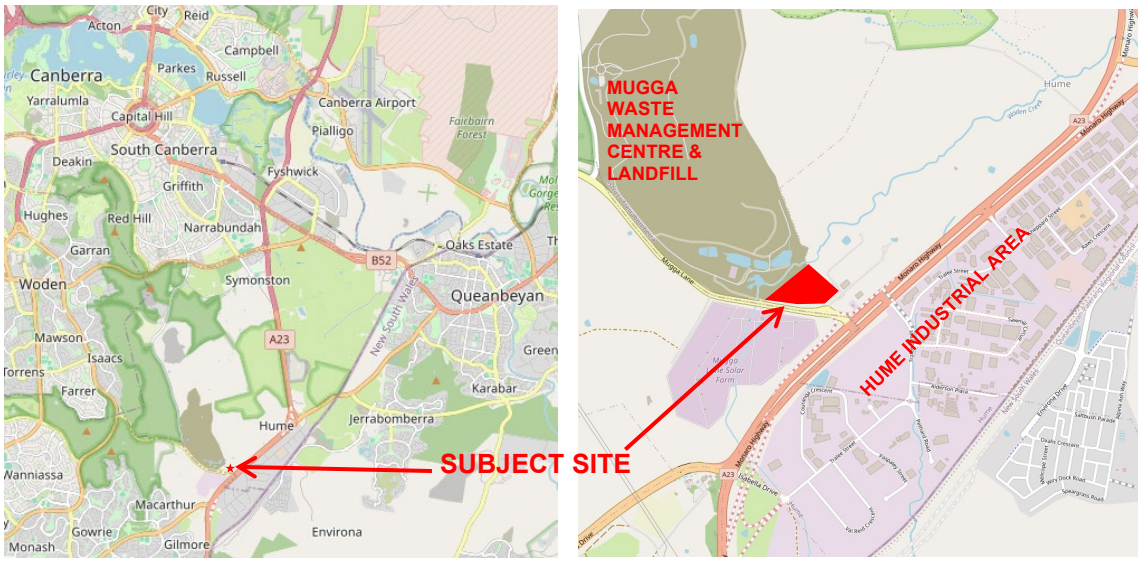
Prepared for Veolia Environmental Services (Australia) Pty Ltd | 2 April 2025

## Introduction

This report is prepared as an Addendum to *Appendix M Air Quality Impact Assessment* prepared by GHD for ACT NoWaste in 2023 and submitted with a draft EIS for a new Materials Recovery Facility (MRF) on Block 12 Section 25 Hume, refer Figure 1.

Since that time ACT NoWaste has passed the responsibility to finalise the EIS to Veolia. GHD are not in a position to complete the EIS and as such, Veolia has engaged Element Environment to undertake this work.

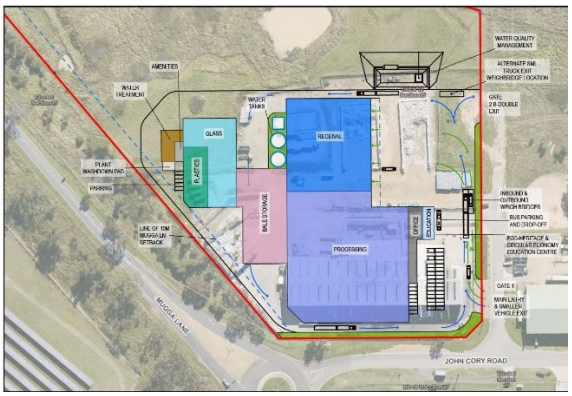
**Figure 1: Site Location**




Veolia has made changes to the proposed site layout and design of the MRF to achieve operational efficiencies (refer Figure 2 & 3).

**Figure 2: Veolia Revised Site Plan**

**Figure 3: GHD Concept Plan**



## Assessment

The GHD *Appendix M – Air Quality Impact Assessment Report* considered the potential impacts on the nearby sensitive receptors and identify the need for any specific mitigation measures. Odour and dust were identified as the key impacts on air quality from the proposal.

Potential air emissions from the proposal were identified based on the proposal description and included particulates and dust from material loading, sorting and glass crushing and odour from any non-compliant loads.

The main change from the GHD assessment and the Veolia proposal is that potential VOC emissions from heating of plastics during processing is no longer an issue as plastic processing is not proposed.

The changes in site layout and change in operations with no processing of plastics, do not result in any change to the matters considered in the GHD *Air Quality Assessment 16 August 2023*. This is based on a review of the direct and indirect impacts plus the cumulative impacts considered in the GHD Report.

As such, the proposed mitigation measures excluding measures related to processing of plastics, which are repeated in Table 1 below, remain relevant for the Veolia MRF development proposal.

**Table 1: Mitigation measures to be implemented for the proposal**

| Potential impact | | Measures to reduce impact | Timing |
|---|---|---|---|
| Elevated dust levels | AQ01 | A dust control protocol would be prepared that forms part of the CEMP to detail management measures, a method for recording dust complaints and monitoring requirements. This would include the following:<br>On days with forecast and actual high winds (i.e over 10 m/s) work effort would be reduced accordingly if wind blown dust is observed to be leaving the site boundary.<br>Dust suppression would be undertaken as required using water sprays, water extension agents, soil stabilising polymers or other media on:<br>Unpaved work areas subject to traffic or wind.<br>Spoil and aggregate stockpiles.<br>During the loading and unloading of dust generating materials.<br>Unpaved access tracks.<br>On days with high background dust levels (due to fire or offsite dust events for example), dust mitigation would be increased in the form of watering or reducing dusty construction activities.<br>Construction vehicles with potential for loss of loads (such as dust or litter) would be covered when using public roads. | Construction |
| | AQ02 | A dust complaints management procedure would be developed as part of the broader complaints management procedures to ensure that any complaints regarding dust are received by appropriate personnel and that potential issues can be investigated, and site practices adjusted accordingly. | Operation |
| | AQ03 | A dust collector system, with HEPA filter, for the glass crusher would be implemented. | Operation |
| | AQ04 | Regular sweeping and housekeeping practices would be undertaken to maintain dust levels within the building. | Operation |
| Elevated levels of airborne pollutants | AQ05 | Plant and equipment would be maintained in good condition to minimise ignition risk, spills and air emissions that may cause nuisance. | Construction |
| Release of odour to | AQ06 | An odour complaints management procedure would be developed as part of the broader complaints management procedures to ensure that any complaints regarding odour are received by appropriate personnel | Operation |

| Potential impact | | Measures to reduce impact | Timing |
|---|---|---|---|
| surrounding communities | | and that potential issues can be investigated, and site practices adjusted accordingly. | |
| | AQ07 | An internal sealed site drainage system would be provided which leads to storage tanks or interceptors that can collect rainwater and any spillage. | Operation |
| Odour and dust emissions | AQ08 | Household sorting practices would be promoted. | Operation |
| | AQ09 | The name and contact details of person(s) accountable for air quality and dust issues would be displayed on the proposal boundary. This may be the environment manager/engineer or the site manager.<br>The head or regional office contact information would be displayed. | Operation |
| | AQ10 | An air monitoring program would be established to ensure workplace exposure limits are maintained. | Operation |
| | AQ11 | Sorted materials would be covered during transport. | Operation |
| | AQ12 | Ventilation equipment and dust or odour control units (if required) must be operational and regularly maintained. Should any unit become faulty, production on those affected lines would be halted immediately and not resumed until emission control systems are fully operational. | Operation |
| | AQ13 | A road sweeper would be used to clean the perimeter of the MRF. | Operation |

## Conclusions

The initial risk identified during construction was low. The operations for the proposed MRF would be enclosed, would not process putrescible waste, and would have minimal processes which are considered a source of odour or particulates. Cumulative impacts from the MRF and the MLRMC are not anticipated.

Based on the mitigation measures identified, an assessment of the residual air quality and odour risks associated with the proposal is considered to be very Low.

# Hume Materials Recovery Facility

## Air Quality Impact Assessment

Transport Canberra and City Services Directorate

16 August 2023

→ **The Power of Commitment**

| Project name | | Materials Recovery Facility Hume ACT PMCA | | | | | |
|---|---|---|---|---|---|---|---|
| Document title | | Hume Materials Recovery Facility \| Air Quality Impact Assessment | | | | | |
| Project number | | 12540460 | | | | | |
| File name | | 12540460-REP_Hume MRF Air quality impact assessment (AutoRecovered).docx | | | | | |
| Status Code | Revision | Author | Reviewer | | Approved for issue | | |
| | | | Name | Signature | Name | Signature | Date |
| S4 | 0 | J Potgieter | E Smith | *on file* | A Montgomery | Record on file | 16/08/23 |

**GHD Pty Ltd | ABN 39 008 488 373**

133 Castlereagh Street, Level 15

Sydney, New South Wales 2000, Australia

**T** +61 2 9239 7100 | **F** +61 2 9239 7199 | **E** sydmail@ghd.com | **ghd.com**

# Abbreviations and meanings

| Term | Meaning |
|---|---|
| ACT | Australian Capital Territory |
| AQI | Air quality index |
| AQMS | Air quality monitoring station |
| AWS | Automatic weather station |
| BCA | Building Code of Australia |
| BoM | Bureau of Meteorology |
| CEMP | Construction Environmental Management Plan |
| CO | Carbon monoxide |
| COAG | Council of Australian Governments |
| EIS | Enviornmental Impact Statement |
| EPA | Environment Protection Act |
| FOGO | Food organics and garden organics |
| GHD | GHD Pty Ltd |
| ha | Hectare |
| HDPE | High density polyethylene |
| HRRE | Hume Resource Recovery Estate |
| IAQM guidance | Institute of Air Quality Management 2014 |
| MLRMC | Mugga Lane Resource Management Centre |
| MRF | Materials recovery facility |
| NEPC | National Environment Protection Council |
| NEPM | National Environment Protection Measure |
| $NO_2$ | Nitrogen dioxide |
| NSW | New South Wales |
| $O_3$ | Ozone |
| OU | Odour units |
| OPF | Organics processing facility |
| PET | Polyethylene terephthalate |
| $PM_{2.5}$ | Particulate matter less than 2.5 µm in aerodynamic equivalent diameter |
| $PM_{10}$ | Particulate matter less than 10 µm in aerodynamic equivalent diameter |
| PP | Polypropylene |
| SLR | SLR Consulting Australia |
| TCCS | Transport Canberra and City Services |
| TSP | Total suspended particulate [matter] |
| VOC | Volatile organic compounds |

# Contents

# Table index



# Figure index



# Appendices

# 1. Introduction

## 1.1 Overview

The ACT Government is proposing to replace and upgrade the existing Material Recovery Facility (MRF) on Block 12, Section 25 Hume, ACT (the proposal site). The proposal site is located to the north of the Monaro Highway in an industrial and rural area located approximately 12.5 km south of Canberra City (refer to Figure 2.1). The existing MRF was extensively damaged due to fire on 26 December 2022 and the facility is non-operational. The main shed remains standing and is currently being used as a waste transfer station to accept recyclables, sort and store materials before being shipped to other processing facilities.

The proposal would replace the existing MRF and provide technological improvements to facilitate greater resource recovery by both increasing the quality of recycled materials and by reducing the amount of nonrecyclable residual waste generated that is currently sent to landfill. The new Hume MRF would be one of the first advanced facilities in Australia to enable separation mixed plastics. Upgraded technology would also improve the quality and therefore marketability of paper and mixed cardboard, mixed plastics and glass that would be received from the ACT and five regional NSW councils.

The proposal would be designed to process up to 115,000 tonnes per year of mixed recyclables. The proposed capacity would provide for population growth and changing consumer behaviours which are expected to contribute to increases in recoverable materials over time.

Key features of the proposal include:

– Replacement of the existing MRF.
– Additional warehouse style facilities.
– Civil works and piling to support the dynamic loads imposed by rotating and high frequency vibrating equipment.
– Expansion of hardstand space towards the west of the proposal site.
– A trade waste system to capture contaminated stormwater runoff.

### 1.1.1 Approval and assessment requirements

This report has been prepared by GHD Pty Ltd (GHD) as part of the environmental impact statement (EIS) for the proposal. The EIS supports the application for approval of the proposal and to address the requirements provided by the ACT Department of Environment, Planning and Sustainable Development Directorate dated 21 July 2022.

The proposal is subject to approval by the planning and land authority within the Environment, Planning and Sustainability Development Directorate.

## 1.2 Purpose of this report

TCCS Directorate has engaged GHD to conduct an air quality assessment for the proposed MRF to be constructed within the Hume Resource Recovery Estate (HRRE) on Block 5, Section 26 Hume, off John Corey Road.

An air quality assessment is required for construction and operation of the proposal to determine any potential impacts on the nearby sensitive receptors and identify the need for any specific mitigation measures. Odour and dust have been identified as the key impacts on air quality from the proposal.

## 1.3 Scope and limitations

ACT Government has provided TCCS with a Scoping Document which specifies the matters that are to be addressed by the EIS in relation to the development proposal. This includes assessment of impacts to air quality, the details of which and the location in this report where they are addressed are described in Table 1.1.

*Table 1.1 Scoping document requirements relevant to climate change and air quality*

| Scoping Document Requirements (Application number: 202200011) | Where addressed in this report |
|---|---|
| Outline greenhouse gas emissions that will be generated by the proposed development during construction and operation, including measures to mitigate the impact. | Separate GHD report |
| Provide quantitative estimates of the Scope 1 and 2 greenhouse gas emissions that will be generated by the proposed development during operation. | Separate GHD report |
| Outline how the proposal has assessed and responded to increased natural disaster risk being driven by climate change, particularly the extreme events of heatwaves, droughts, storms with flash flooding, and bushfires. | Separate GHD report |
| Consider air quality impacts such as odour emissions and dust due to increased traffic movements and outline avoidance and mitigation measures to ensure any impacts are reduced. | This report |

The following tasks have been completed as part of the air quality assessment:

- Review of available ambient air quality, odour data, complaint data and reports in the local area including Mugga Lane Resource Management Centre (MLRMC).
- A literature review of similar existing or proposed MRF facilities has been undertaken, including odour assessments and predicted odour contours (publicly available).
- Review of proposed waste types and quantities and comments on the odour and dust (particulates) generating potential. GHD has prepared a high level odour and particulate inventory of proposed operations based on provided source/process emission rate data, flow rates, activity type. GHD has reviewed any provided emission rate data for relevance in the context of the proposal site, other available representative data and the expectations in ACT/NSW.
- A risk-based odour and particulate assessment has been undertaken based on the performance of the existing facility, existing and future separation distances, proposed waste types and quantities and building design including odour control and ventilation.
- Discussion of the potential for odour and particulate impacts in the context of relevant NSW Guidance and the *ACT Separation Distance Guidelines for Air Emissions November 2018.*
- The potential for cumulative odour impacts has been qualitatively assessed, most critically relating for the potential of interacting odour impacts from the MLRMC.
- Qualitatively described the effect of emissions from traffic during construction and operation of the facility and equipment.
- Preparation of a standalone qualitative air quality report outlining the methodology and findings of the assessment.

This report: has been prepared by GHD for Transport Canberra and City Services Directorate and may only be used and relied on by Transport Canberra and City Services Directorate for the purpose agreed between GHD and Transport Canberra and City Services Directorate as set out in Section 1.3 of this report.

GHD otherwise disclaims responsibility to any person other than Transport Canberra and City Services Directorate arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer Section(s) 1.4 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

## 1.4 Assumptions

The following assumptions apply to this assessment:

- Building ventilation has not yet been designed or provided. It is assumed that all air discharge points would meet relevant building ventilation and emission standards, particularly for particulates. It is recommended that once the building ventilation system has been designed, a review or additional air quality assessment is undertaken to identify any risks and the need for any specific mitigation.
- The MRF would not accept odorous materials. Any contaminated material would be removed from the facility as soon as practicable and disposed of at the landfill site.
- Roads and access to and from the MRF are sealed, and not a source of dust.
- Existing recycling facility onsite was not observed to be a significant source of odour or dust while in operation based on the provided survey history. The proposed MRF is enclosed and would not likely increase odour or dust, and potentially would be less even with greater throughput due to additional controls.
- Assessment assumes that plastic recycling is limited to mechanical processing only, i.e. washing, shredding. There is potential for additional processing to include pelletising of plastic which may include heating, extruding or other processes which may result in fumes. Emissions from heating of plastics are dependent on plastic type, temperature of processes and any emission controls. Detailed information is not currently known however it is assumed that additional assessment would be needed to determine the need for, and type of emission controls to be included in the design in order to minimise emissions from plastic processing.
- An enclosed MRF is considered best practice for air emissions.
- Other operations at the Mugga Lane Resource Management Centre (MLRMC) including the organics processing facility (OPF) and landfill effectively manage emissions of odour.

# 2. Proposal site

The proposal would be located within the current bounds of the HRRE on Block 12, Section 25 Hume, Recycling Road (see Figure 2.1). The proposal site is surrounded by industrial facilities including:

– ACT Skip Hire across Recycling Road to the east.
– Soft Landing Mattress Recycling located south-east, across John Cory Road.
– Hume Industrial Estate located to the south and east across Monaro Highway.
– Mugga Lane Landfill located approximately 200 metres (m) to the north-west.
– Proposed FOGO facility located to the east, across John Cory Road.

The proposed relevant built area is estimated to be 3.5 hectares (ha) which includes the loading bay, processing area, and car park. The roadways on-site would be 0.5 ha, whereas the building would be 1.05 ha. The new MRF would be accessed via Recycling Road, which is situated at the east of the proposal site.


**Legend**

- Proposal site
- Cadastre
- Watercourses

Paper Size ISO A4

0 25 50

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

GHD

**Transport Canberra and City Services**
**Hume Materials Recovery Facility**
**Air Quality Impact Assessment**

Project No. **12540460**
Revision No. **0**
Date **16/08/2023**

## Proposal location

# FIGURE 2.1

\\ghdnet\ghd\AU\Canberra\Projects\23\12540460\GIS\Maps\Deliverables\MRF_AQIA.aprx
Print date: 16 Aug 2023 - 11:31

# 3. Legislative and policy context

The following legislation and guidance are applicable to the air quality impact assessment:

– National Environment Protection Council (NEPC) National Environment Protection (Ambient Air Quality) Measure 2021 (the Air NEPM).
– Air Environment Protection Policy (ACT Government, 1999) (the Air EPP).
– Guidance on the assessment of dust from demolition and construction (Institute of Air Quality Management, 2014) (IAQM guidance).
– Technical framework - Assessment and management of odour from stationary sources in NSW (NSW Department of Environment and Conservation, 2006) (the Technical Framework).
– NSW EPA Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW EPA, 2022) (the Approved Methods).
– Separation distance guidelines for air emissions (ACT Government, 2018).

The National Environment Protection Council of Environmental Ministers, now the NEPC , set uniform national standards for ambient air quality in May 2021. This is known as the Air NEPM. The Air NEPM sets non-binding standards and goals (for 2025). The Air NEPM contains goals for the identified relevant pollutants inclusive of particulates and concentration limits, averaging periods and number of allowed exceedances for each of the identified pollutants.

The Air EPP contains information and policies relating to the management of ambient air quality and pollutant emissions to the atmosphere in the ACT, in accordance with the Environment Protection Act 1997.

As specific guidelines for odour assessment are not specified for the ACT, the Technical Framework (NSW Department of Environment and Conservation, 2006) and the Approved Methods (NSW EPA, 2022) have been used for this odour assessment. The Technical Framework provides a legislative context for the control of odour and presents odour assessment criteria guidelines. It provides a framework for different levels of odour assessment, strategies to mitigate odour, and guidance for performance monitoring, regulation and enforcement.

The ACT Government have published separation distance guidelines as one method of considering potential conflicts between incompatible land uses. These are recommendations only, and there is always opportunity for a proponent to demonstrate compliance with relevant legislative requirements through other methods. It is noted that separation distances are developed to minimise impacts that may occur when there are accidents, power failure, equipment failure (i.e. odour controls) or unusual meteorological conditions that may occur, as well as normal operation.

Based on a review of the air quality emissions from the construction and operation of the proposal it was considered appropriate to adopt a qualitative risk-based approach to assess potential air quality impacts. This style of approach focuses on identifying the likely air emissions from the proposal and recommending appropriate mitigation measures to effectively management potential air quality impacts.

## 3.1 Construction

A review of potential construction air quality emissions was undertaken, and a risk-based approach in accordance with the IAQM guidance was adopted to assess dust from the construction of the proposal. The IAQM guidance contains a four-step process to qualitatively assess potential dust impacts from construction activities. An overview of the methodology is provided in Table 3.1.

***Table 3.1 Overview of IAQM guidance risk assessment***

| Step | IAQM Process |
|---|---|
| 1 | A conservative screening based on distance to the nearest sensitive receptor (human and ecological receptor). Further assessment is required if a sensitive receptor is located within the screening criteria. |
| 2 | Assess the risk of uncontrolled (no mitigation measures applied) dust impacts (including dust soiling effects, health effects and ecological effects) based on: |

| Step | IAQM Process |
|---|---|
| | – Dust emission magnitude of construction activities (demolition, earthworks, construction and trackout).<br>– Sensitivity of the area (based on sensitivity of nearby receptors, number of nearby receptors and distance from source). |
| 3 | Determine proposal site specific mitigation measures to appropriately manage all activities with potential to cause dust impacts. |
| 4 | Assess the residual risk of dust impacts after site specific mitigation measures have been implemented. |

# 3.2 Operation

During operation of the MRF, cumulative odour and particulate emissions from the entire MLRMC will need to be managed in order not to impact on the air quality in the surrounding environment and sensitive receptors.

## 3.2.1 Odour

The proposed MRF is not a significant source of odour, however the MLRMC needs to ensure cumulative odour from the proposed site does not lead to impacts at the nearby sensitive receptors. Any odour impact assessments undertaken with dispersion modelling would need to demonstrate compliance with the impact assessment criteria from the Technical Framework shown below in Table 3.2.

***Table 3.2 Odour assessment criteria***

| Population of affected community | Odour assessment criteria (OU) |
|---|---|
| Rural single residence (≤2) | 7 |
| ~ 10 | 6 |
| ~ 30 | 5 |
| ~ 125 | 4 |
| ~ 500 | 3 |
| Urban area (≥2000) and/or schools and hospitals | 2 |

## 3.2.2 Particulates and dust

Assessment criteria used for the operation of the proposal is from the Air NEPM air quality objectives, which represent the most recent and stringent standards for protection of the air quality environment. The objective of the criteria is ambient air quality that minimises the risk of adverse health impacts from exposure to air pollution. Achieving compliance with the impact assessment criteria will help demonstrate that the proposal will operate in a manner that protects human and environmental health and amenity.

The adopted air quality assessment criteria are summarised in Table 3.3.

***Table 3.3 Air quality impact assessment criteria***

| Pollutant | Averaging period | Impact location | Impact type | Criteria (µg/m$^3$) | |
|---|---|---|---|---|---|
| | | | | EPA Assessment Criteria | Air NEPM |
| **Airborne particulate matter and common gaseous pollutants** | | | | | |
| TSP | Annual | Sensitive receptor | Cumulative | 90 | - |
| $PM_{10}$ | 24 hour | Sensitive receptor | Cumulative | 50 | 50 |
| | Annual | Sensitive receptor | Cumulative | 25 | 25 |
| $PM_{2.5}$ | 24 hour | Sensitive receptor | Cumulative | 25 | 25 (reduced to 20 in 2025) |

| Pollutant | Averaging period | Impact location | Impact type | Criteria (µg/m³) | |
|---|---|---|---|---|---|
| | | | | EPA Assessment Criteria | Air NEPM |
| | Annual | Sensitive receptor | Cumulative | 8 | 8 (reduced to 7 in 2025) |
| Deposited dust | Annual (maximum increase) | Sensitive receptor | Cumulative | 2 g/m²/month | - |
| | Annual (maximum total) | Sensitive receptor | Cumulative | 4 g/m²/month | - |

# 4. Proposal description

## 4.1 Existing facility

The existing MRF was processing the indicative quantities of recyclables set out in Table 4.1 at the time it ceased operating due to a catastrophic fire in December 2022. The new MRF (refer Section 4.3) will need to process at least these volumes (indexed for population-driven volume growth) at the time it commences operation.

*Table 4.1 Indicative processing volumes – existing MRF (2022)*

| Stream | Nominal output (tonnes per annum) |
|---|---|
| Mixed paper and cardboard | 30,000 |
| Mixed plastics | 2,000 |
| Glass | 20,000 |
| PET | 1,500 |
| HDPE | 1,000 |
| Aluminium and other metals | 2,500 |
| Refined product tonnes per annum | 57,000 |
| Residual waste* | 8,000 |
| **Total tonnes per annum** | **65,000** |

## 4.2 Construction of the proposal

The construction of the facility is expected to occur in three stages. Stage 1 is expected to include:

– Site preparation including clearing of the proposal site and grading.
– Construction of entry/exit and service roads and line marking.
– Installation of perimeter/boundary security fencing and gates.
– Creation of detention and sedimentation dams/basins.

Stage 2 would include the construction of the MRF facility with a capacity of up to 80,000 tpa. This includes the construction of erosion and sediment control infrastructure, earthworks, the MRF facility and the installation of new equipment. Construction activities would include:

– Bulk earthworks for site shaping and surface water drainage and detention ponds.
– Detailed excavation for lift and stair raft pads.
– Dam fill in.
– Pouring concrete foundation slab, footings, hardstand and suspended slabs for the main buildings.
– Construction of pavement areas for car park and access roads and new proposal site entrance.
– Installation of steel truss framework for structures.
– Erection of pre-cast concrete panels for external and internal partition walls and metal roof for site buildings.
– Installation of processing equipment.
– Installation of firewater tanks.
– Construction of weighbridges and weighbridge office.
– Installation of fencing and signage.
– Temporary ancillary infrastructure to facilitate construction works would include:
– Installation of a temporary main switchboard and electrical riser to provide power during construction.
    - Establishment of site offices and amenities.

Stage 3 would include the upgrade of the MRF facility to the full 115,000 tpa capacity and include the beneficiation stages of the recycling process. Construction details are not yet available for this stage, but construction is not expected to cause more dust generation than the previous stages.

## 4.3 Operation of the proposal

The Hume MRF requires technological improvements to facilitate greater resources recovery by increasing the quality of recycled materials and reducing the amount of non-recyclable residual waste generated that is currently sent to landfill. The upgraded facility is intended to have 115,000 tonnes annual capacity to improve the quality and marketability of paper and mixed cardboard, mixed plastics and glass from the ACT and five regional NSW councils. The upgraded facility's capacity will aim to meet the population growth and changing consumer behaviour which may contribute to increase in recoverable materials.

The intention is to continue to operate the existing MRF at full capacity during the construction phase of the proposal. This area will be fenced off from construction works and operate separately to construction works.

The proposal aims to improve the existing MRF operations and provide:

- Technical improvements to optically separate, identify, sort and segregate or bale specific marketable product streams.
- Technical improvements to separate, identify and sort single resin stream plastic products, like polyethylene terephthalate (PET) (clear and coloured), high density polyethylene (HDPE) (opaque and coloured) and potentially polypropylene (PP) to enable further processing such as flaking / pelletising and washing.
- Washing of glass, and granulating and washing PET, HDPE.
- Technical improvements to separate, crush, screen and wash glass sand, to nominally less than 5 mm.
- Improved optical sorting to identify, separate, remove contaminants, quality control and bale paper and cardboard products.
- Improved and expanded baling processes in the CDS separated materials.
- Improved and expanded baling processes in the to enable these streams to be processed separately to prevent cross-contamination of kerbside collected beverage container materials (yellow bin co-mingled), and CDS materials.
- Technologies for optical sorting capability using material identification through processes like Near Infra-Red, colour and metal sensing.
- Optimised separation to capture live data for all processed waste streams and process manufacturing capabilities (inbound and outbound).
- An improved plant layout and manual sorting/quality control station ergonomics.
- An upgrade to data collection, management, and analysis systems.

There is a requirement to upgrade the proposal site to achieve:

- Environmental compliance for wastewater capture and reuse, and stormwater management
- Additional Emergency Services Agency (ESA) site access.
- Site security and improved fencing.
- Site safety through civil construction of enhanced pavement areas for optimised traffic and pedestrian management.
- Material separation and storage capabilities.
- Additional fire suppression capability including hydrants and ring mains (noting current building requires a fire protection capability) and meet Fire Safety Guideline for Fire Safety in Waste Facilities (Fire and Rescue NSW, 2020).
- Construction of a new building adjacent to the existing MRF for the introduction of glass crushing and washing, and plastics processing (which may involve shredding and pelletising) and washing.
- Upgrades to the existing building to achieve Building Code of Australia (BCA) compliance.
- Upgrade the existing building receival hall layout and pre-sort capability for gross contaminants.

– Upgrade to the existing facility layout to introduce the optimisation of paper and cardboard separation and baling.

A high level conceptual process flow chart for the proposed facility is shown in Figure 4.1.

# Hume MRF Proposed Configuration

## Main MRF Operations

MRF Infeed

Batteries

Gas Bottles

White Goods

Presort QC

Waste

Large Steel

Large Plastics

Fibre, Containers & Glass Separation

Cardboard QC Station

Paper Optics Refinement

Container Separation

Cardboard Storage Bunker

Paper Storage Bunker

Paper/Cardboard Baler

To Bale Storage Area

Plastic Optical Sort

Ferrous Separation

Non Ferrous Separation

3D Carton Recovery

Plastic Storage Bunkers

Ferrous Storage Bunkers

Plastic Storage Bunkers

Container QC Station

Container Baler

To Bale Storage Area

Waste

Waste Compactors

## Glass Processing

Glass Infeed

Glass Refining Process

Glass Storage Bunker

## CDS & Commercial Cardboard Processing

CDS Infeed

Presort QC

CDS Optics Refinement

Plastic Storage Bunkers

Plastic Storage Bunkers

Tetrapak Storage Bunkers

Container QC Station

Container Baler

To Bale Storage Area

Commercial Infeed

Presort QC

Commercial Cardboard Baler

To Bale Storage Area

## Plastics Processing

Washing

Additional Sorting

Flaking / Pelletising

Storage Bunkers

# 5. Existing environment

## 5.1 Sensitive receptors

Sensitive receptors are defined based on the type of occupancy and the activities performed in the land use. Sensitive receptors could include both existing and proposed:

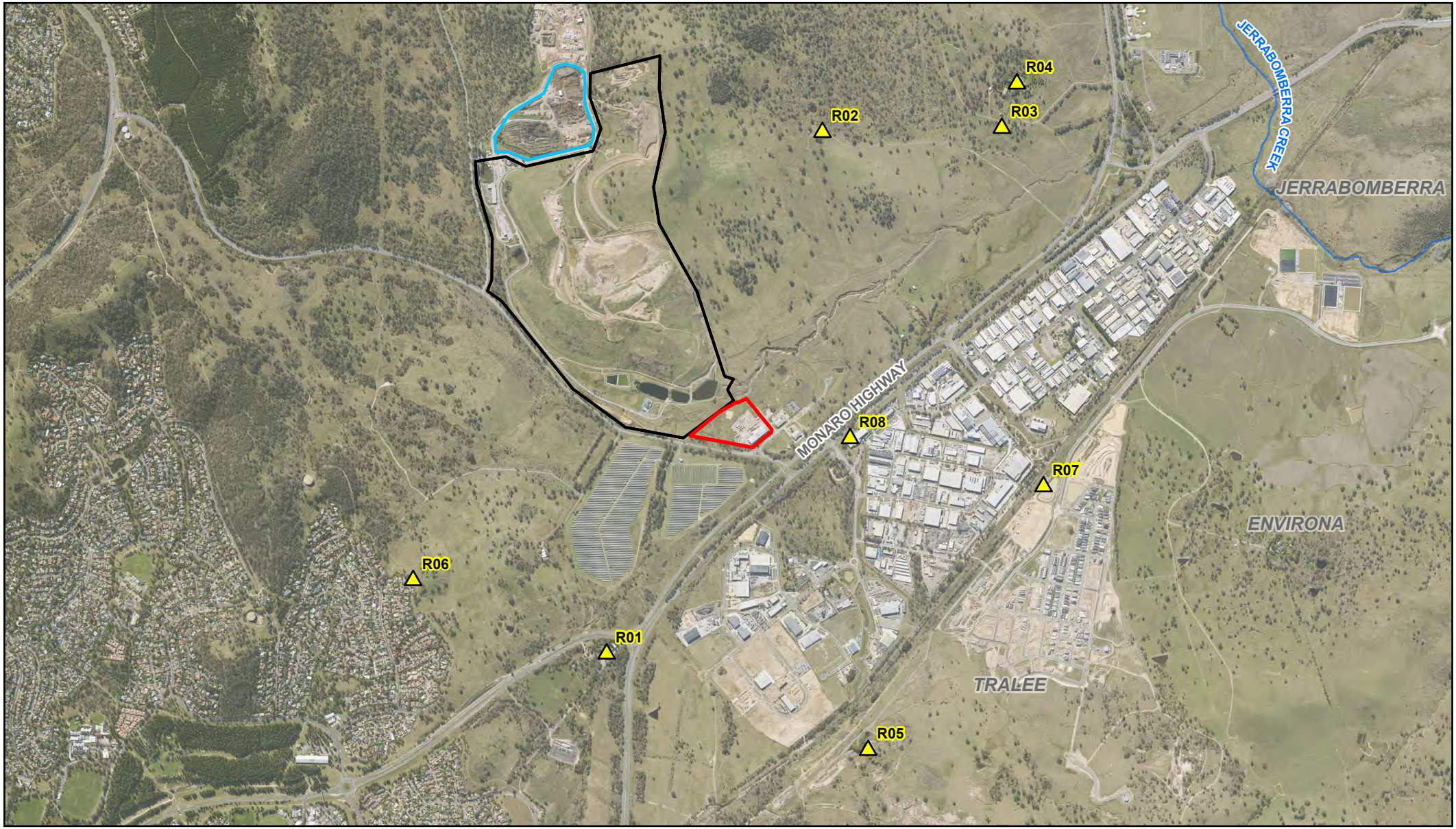
– Residences.
– Educational institutes.
– Hospitals and medical facilities.
– Places of worship.
– Commercial or industrial premises.
– Passive recreational areas such as parks and reserves.
– Active recreational areas such as sporting fields, golf courses. Note that these recreational areas are only considered sensitive when they are in use or occupied.

The nearest existing residential area is the suburb of MacArthur, located approximately 2 km southwest of the proposal site. The developing suburb of Tralee is located approximately 1.1 km southeast of the proposal site. Isolated sensitive receptors located nearer to the proposal site are described in Table 5.1 and shown in Figure 5.1.

***Table 5.1 Sensitive receptors within 2 km of the proposal site***

| ID | Receptor Type | Address | Easting (m E) | Northing (m S) | Distance and direction from proposal site |
|---|---|---|---|---|---|
| R01 | Commercial | Rose Cottage Canberra, corner of Isabella Dr and Monaro Hwy | 694648.43 | 6079835.47 | 1.2 km SW |
| R02 | Residence | Jerrabomberra, 2620 | 695689.61 | 6082349.87 | 1.5 km NE |
| R03 | Residence | 10171 Monaro Hwy, Hume | 696554.92 | 6082369.50 | 1.8 km NE |
| R04 | Residence | Woden Homestead, 10225 Monaro Hwy, Hume | 696627.56 | 6082583.61 | 2.1 km NE |
| R05 | Residence | Tralee, 2620 | 695909.64 | 6079370.38 | 1.6 km S |
| R06 | Residential area | MacArthur | 693721.19 | 6080206.95 | 1.7 km SW |
| R07 | Residential area | Tralee | 696709.53 | 6080562.93 | 1.4 km SE |
| R08 | Industrial area | Hume industrial area | 695824.83 | 6080872.12 | 0.4 km S |

The Mugga Lane Solar Park is located approximately 100 m west of the proposal site however this is not considered a sensitive receptor as it is not regularly populated and therefore would not be impacted by odour or particulates.




**Legend**

- Proposal site
- Landfill
- Corkhills
- Watercourses
- Sensitive receptors

Paper Size ISO A4

0 0.25 0.5

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

GHD

**Transport Canberra and City Services**
**Hume Materials Recovery Facility**
**Air Quality Impact Assessment**

Project No. **12540460**
Revision No. **0**
Date **16/08/2023**

## Sensitive receptors

# FIGURE 5.1

\\ghdnet\ghd\AU\Canberra\Projects\23\12540460\GIS\Maps\Deliverables\MRF_AQIA.aprx
Print date: 16 Aug 2023 - 10:20

Data source: Metromap Tile Service: extracted 16/08/2023; DEM - ACT Government, 2015; Roads, Cadastre - ACTmapi, 2022; Watercourses - NSWSS, 2022.
Created by: akildea

## 5.2 Background air quality

An assessment of the total impact, which includes the proposal impact as well as the background concentrations, is required.

### 5.2.1 Background ACT air quality monitoring data

Ambient air quality monitoring is undertaken in the ACT to support both the National Environment Protection Measures and Air Quality Index (AQI) to better communicate the ambient air quality to the ACT Community. The nearest station to the proposal site is the Monash AQMS which is located approximately 5.8 km west of the proposal site. This stations records concentrations of $NO_2$, CO, $O_3$, $PM_{10}$ and $PM_{2.5}$. A summary of this data for the last five years is presented in Table 5.2.

*Table 5.2 Summary of available background air quality data recorded by the Monash AQMS for 2017-2021*

| Pollutant | Averaging period | Recorded background concentration by year | | | | |
|---|---|---|---|---|---|---|
| | | 2017 | 2018 | 2019 | 2020 | 2021 |
| $NO_2$ | Maximum 1 hour (ppm) | 0.04 | 0.04 | 0.08 | 0.12 | 0.04 |
| | Annual average (ppm) | 0.005 | 0.004 | 0.005 | 0.004 | 0.003 |
| CO | Maximum 8 hour (ppm) | 0.7 | 0.7 | 4.8 | 4.9 | 0.6 |
| | Annual average (ppm) | 0.23 | 0.21 | 0.21 | 0.30 | 0.11 |
| $O_3$ | Maximum 8 hour (ppm) | 0.05 | 0.05 | 0.11 | 0.09 | 0.04 |
| | Annual average (ppm) | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| $PM_{10}$ | Maximum 24 hour (µg/m$^3$) | - | - | 310.8 | 1215.8 | 38.7 |
| | Maximum 24 hour (below assessment criteria) (µg/m$^3$) | - | - | 49.9 | 50.0 | 38.7 |
| | Annual average (µg/m$^3$) | - | - | 19.0 | 29.2 | 10.5 |
| $PM_{2.5}$ | Maximum 24 hour (µg/m$^3$) | 37.0 | 39.2 | 296.4 | 1296.3 | 95.3 |
| | Maximum 24 hour (below assessment criteria) (µg/m$^3$) | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| | Annual average (µg/m$^3$) | 8.1 | 7.4 | 14.2 | 25.1 | 7.1 |
| "-" indicates data not available | | | | | | |

### 5.2.2 Mugga Lane Resource Management Centre monitoring

Four rounds of ambient odour field surveys at the MLRMC were undertaken by SLR Consulting Australia (SLR) in 2021 and 2022, commissioned by ACT NOWaste, to assess the intensity of odours in the area surrounding the landfill, the green waste processing facility (Corkhill) and the existing MRF. In addition, infield gas and odour measurements at the landfill were performed to quantify the effectiveness of the tarpaulin covers being used as daily covers.

The odour surveys revealed that the odour intensities observed beyond the MLRMC boundary were at most 'strong'. Stronger odours (ranging from 'strong' to 'extremely strong') were observed within the MLMRC and MRF boundaries. The surveys also indicated that odours arising from the MRF have a relatively low plume extent while odours from Corkhill have the largest.

*Table 5.3 Ambient odour field survey results - maximum odour intensities recorded across three sampling days*

| Sampling date | Landfill | | MRF | | Corkhill | | Sampling report |
|---|---|---|---|---|---|---|---|
| | Within boundary | Outside of boundary* | Within boundary | Outside of boundary* | Within boundary | Outside of boundary* | |
| May 2021 | Very strong | Distinct | Strong | Distinct | Very strong | Distinct | (SLR Consulting Australia, 2021a) |

| Sampling date | Landfill | | MRF | | Corkhill | | Sampling report |
|---|---|---|---|---|---|---|---|
| | Within boundary | Outside of boundary* | Within boundary | Outside of boundary* | Within boundary | Outside of boundary* | |
| December 2021 | Extremely strong | Strong | Strong | Distinct | Extremely strong | Strong | (SLR Consulting Australia, 2021b) |
| February 2022 | Extremely strong | Distinct | Strong | Distinct | Very strong | Strong | (SLR Consulting Australia, 2022a) |
| May 2022 | Extremely strong | Distinct | Strong | Distinct | Extremely strong | Distinct | (SLR Consulting Australia, 2022b) |
| * Note: 'Outside of boundary' does not indicate at a receptor location, these surveys were generally on roads around the facilities. | | | | | | | |

No perceptible odours were detected in the residential areas of Macarthur, Fadden or Chisholm or at any residential receptors. The maximum odour intensity observed at an industrial receptor across all surveys was 'Distinct'.

Based on this, Corkhill and the landfill have been identified as the most significant sources of odour emissions from the MLRMC, with minimal impacts from the MRF.

### 5.2.3 Odour complaint history

A total of nine complaints regarding odour detected in suburbs around the MLRMC were recorded in 2020, however the precise cause of odour was not identified. Due to the climatic conditions at the time of each complaint, it was unlikely that the Mugga Lane landfill was the cause of the odour.

No additional odour complaints have been provided for this assessment.

## 5.3 Climate and meteorology

The local climate and meteorology (weather) within the study area is of critical importance when assessing the potential for air quality impacts at sensitive receptors.

The meteorological environment relevant to a proposal site is best understood through review of data collected from long-running monitoring weather stations, most commonly operated by the Bureau of Meteorology (BoM) as well as state authorities and in some instances private entities. Simulation of the meteorological environment (modelling) is a useful tool in understanding the environment where suitable meteorological observations are not available.

### 5.3.1 Available observations

The BoM operates a network of automatic weather stations (AWS) across Australia. A BoM AWS typically measures critical meteorological parameters including wind speed, wind direction, temperature, relative humidity, and pressure, with some stations also measuring cloud coverage. The nearest AWS to the proposal site is the BoM AWS located in Tuggeranong, approximately 5.8 km west of the site.

#### 5.3.1.1 Temperature

Figure 5.2 shows monthly mean temperature statistics for data measured at BoM Tuggeranong AWS for the period 2017 through 2021. The 50$^{th}$ percentile monthly maximum and minimum temperatures are used to show the typical temperature range for each month of the year, as well as the average monthly maximum and minimum temperatures. These are shown along with the monthly average temperature.

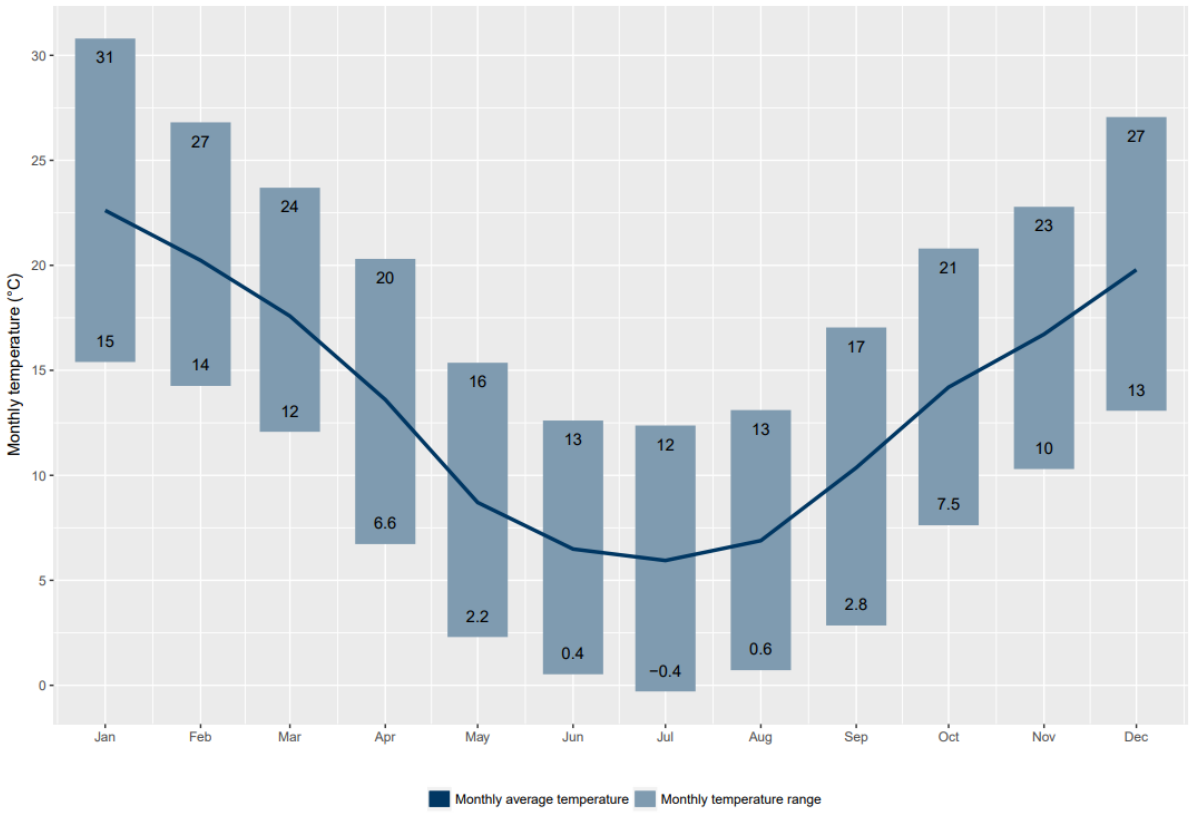



*Figure 5.2 Monthly climate temperature statistics from BoM Tuggeranong (2017-2021)*

### 5.3.1.2 Rainfall

Figure 5.3 shows monthly rainfall statistics for data measured at BoM Tuggeranong AWS for the period 2017 through 2021. The statistics shown include average monthly rainfall amount (mm) and average number of days per month where rainfall is greater than 0.25mm.

The data shows that the number of rain days and the total rainfall amounts are greater during the spring and summer months.

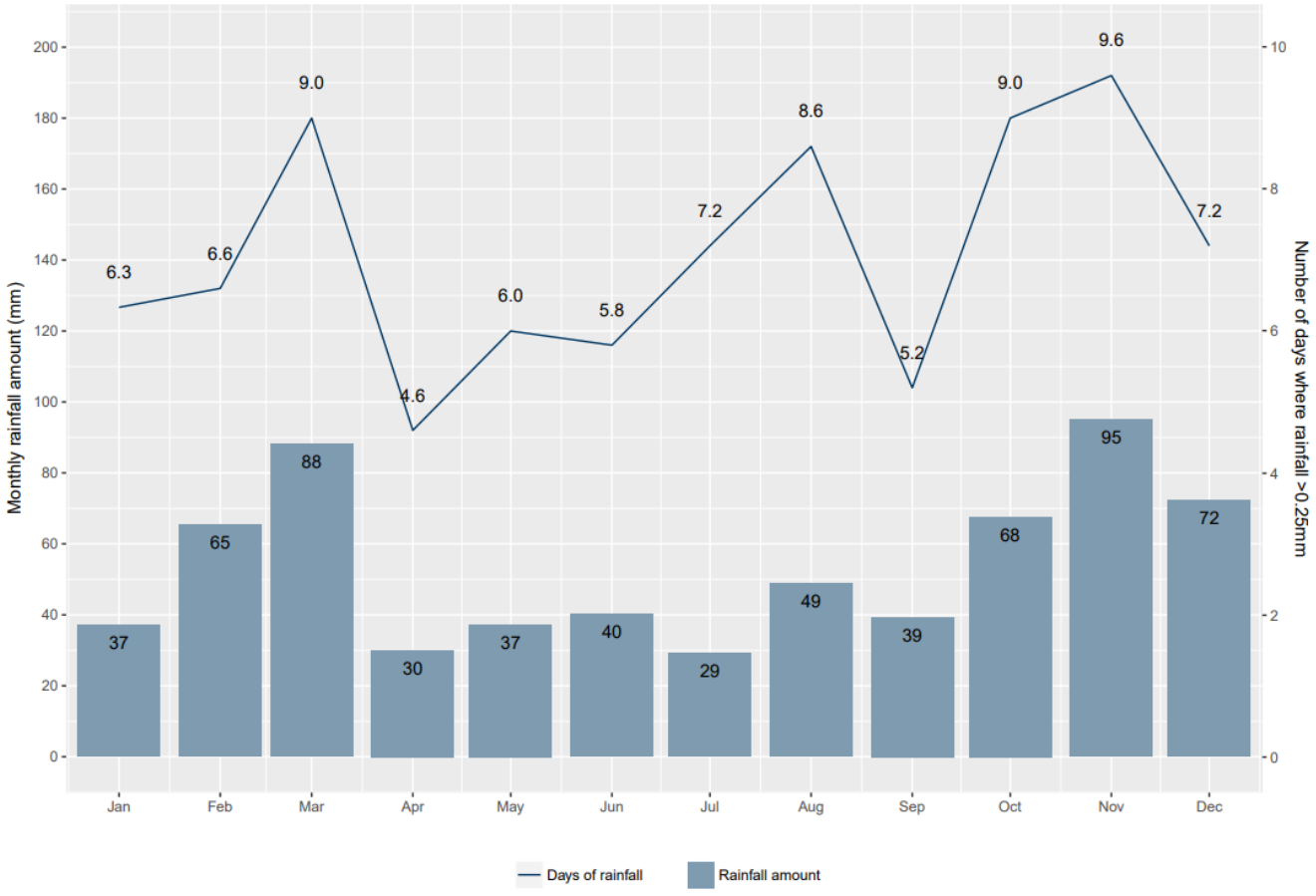



*Figure 5.3 Average monthly rainfall collected from BoM Tuggeranong (2017-2021)*

### 5.3.1.3 Wind

Figure 5.4 shows the average annual wind rose and Figure 5.5 shows the average seasonal wind roses, both measured at BoM Tuggeranong AWS for the period 2017 through 2021. Figure 5.4 shows the following features:

- The predominant annual average wind direction is from the northwest.
- The average wind speed measured was 2.4 metres per second.
- Calm conditions (wind speeds less than 0.5 m/s) occurred 21.5% of the time. Calm conditions are often associated with poor odour dispersion.
- High wind speeds (winds greater than 5 m/s which are often attributed to dust lift off) mostly occur from the northwest and south.

Figure 5.5 extends these observations, showing that:

- The winds from the northwest mainly occur during spring and winter.
- Autumn has a slightly lower average wind speed than the other seasons.
- Summer has the smallest proportion of calm conditions.

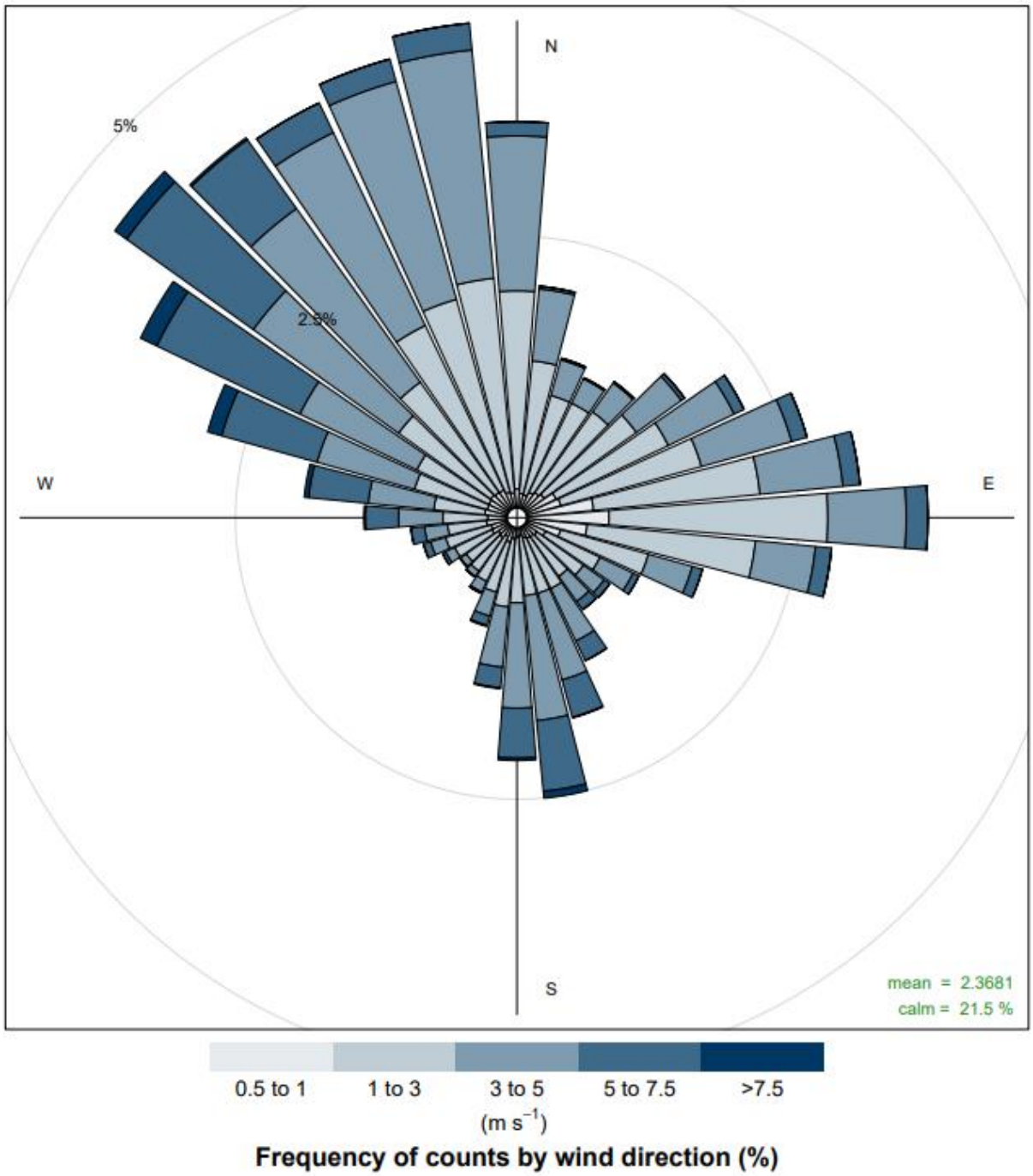



*Figure 5.4 Annual average wind rose collected from BoM Tuggeranong (2017-2021)*

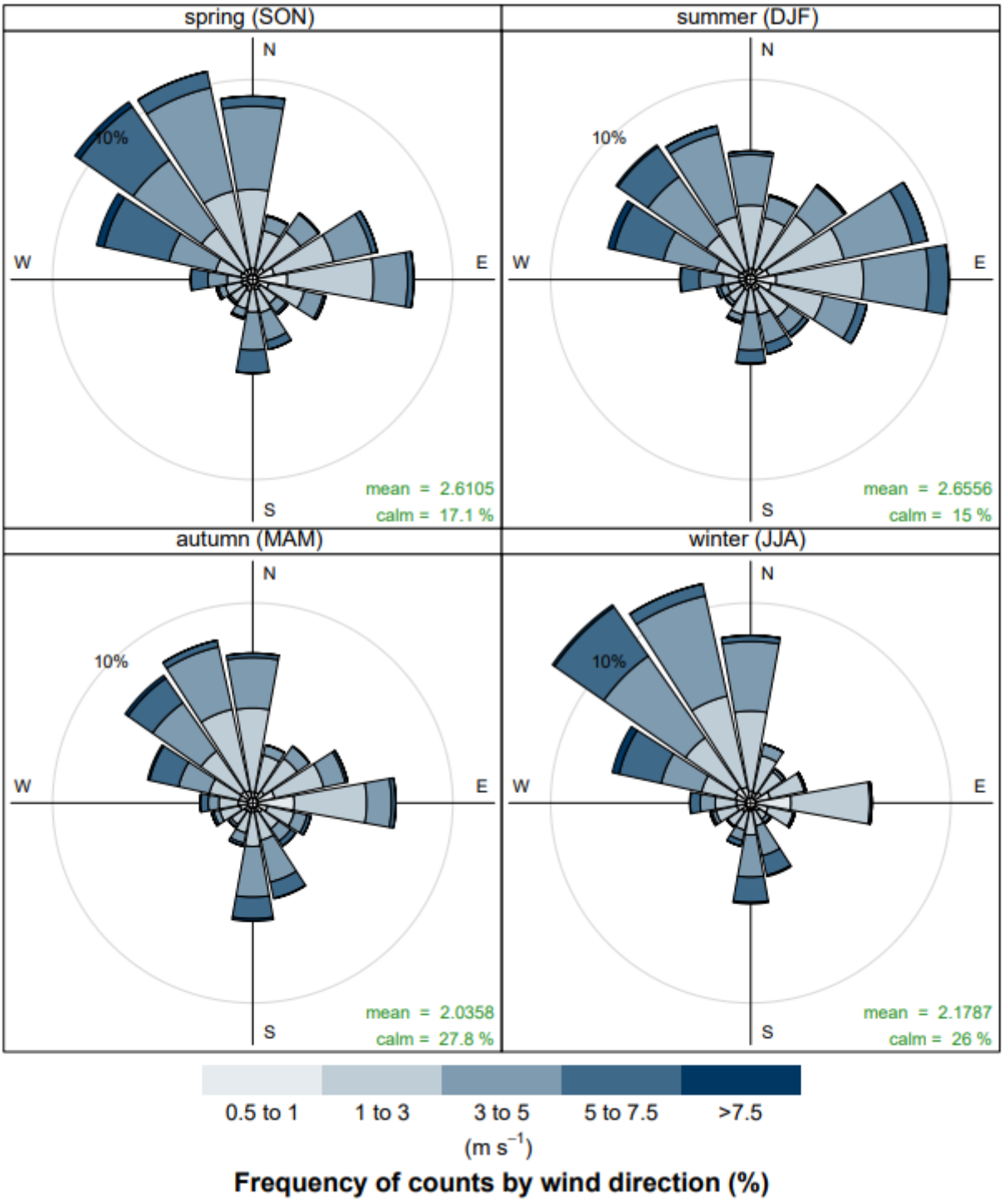



*Figure 5.5* *Average seasonal wind roses collected from BoM Tuggeranong (2017-2021)*

## 5.4 Nearby facilities

The land use around the facility is mainly industrial and rural operations. Facilities near the proposal site which may also be a source of odour include:

– Boral asphalt plant.
– Hume asphalt plant.
– Capital asphalt plant.
– Dry waste facility.

As the odours emitted from these facilities is of a different character to that from the MRF, no cumulative impacts are anticipated.

# 6. Impact assessment

## 6.1 Construction emissions

The generation of dust and particulate matter are the primary pollutants during the construction phase of the proposal. A risk-based assessment in accordance with IAQM guidance was undertaken to assess potential particulate impacts during the construction of the proposal.

Construction works has been divided into four activity groups that have potential to cause significant dust emissions. These activities are demolition, earthworks, construction and track-out.

To identify the risk of dust impact from each construction activity, the size and scale of each activity must be determined as well as the sensitivity of the surrounding environment.

### Size and scale

The size and scale of the activities are determined by not only the physical size of the proposal but other factors that are likely to increase or decrease the amount of dust created during each construction activity. The definitions used to classify the dust emission magnitudes as per the IAQM guidance are provided in Appendix B. Table 6.1 outlines these factors for each activity and the resulting size and scale descriptor.

*Table 6.1 Size and scale of construction activities*

| Activity | Description | Size and scale descriptor |
|---|---|---|
| Demolition | – The total site area of the existing MRF is approximately 21,000 $m^2$, and the footprint size of the existing warehouse makes up approximately 4,000$m^2$ within the total site area.<br>– The existing hardstand would be utilised for the proposed facility and therefore would not be demolished.<br>– Total building volume has been estimated to be 20,000 $m^3$ – 50,000 $m^3$, 10-20 m above ground level. | Medium |
| Earthworks | – Bulk earthworks for site shaping and surface water drainage and detention ponds as well as detailed excavation for lift and stair raft pads and dam fill in are required.<br>– Total site area is expected to be >10,000 $m^2$. | Large |
| Construction | – Preparation of the ground surface includes pouring concrete foundation slab, footings, hardstand and suspended slabs as well as construction of pavement areas for car park and access roads and new site entrance.<br>– Construction of the facilities includes installation of steel truss frames, erection of pre-cast concrete panels and metal roofing, and installation of equipment.<br>– Other construction activities include construction of weighbridge and weighbridge office, installation of fencing and signage, installation of temporary ancillary infrastructure including site offices and amenities.<br>– Preparation of the ground surface is expected to generate the most dust, and has an expected building volume of 25,000 $m^3$ – 100,000 $m^3$. | Medium |
| Track-out | – In the absence of construction traffic information, a worst-case scenario has been assumed with >50 heavy duty vehicle movements in any one day on a potentially dust surface material, with an unpaved road length of >100m. | Large |

### Sensitivity

The sensitivity of the surrounding environment is determined by the number of high risk, medium risk and low risk receptors within a certain proximity of the construction footprint. High sensitivity receptors include dwellings, educational institutions, and medical facilities. Medium sensitivity receptors include commercial, and industrial

premises. Low sensitivity receptors include farmland, recreational parklands, and other public spaces. The sensitivity is determined for three areas of concern, these are:

– Sensitivities of people to dust soiling effects.
– Sensitivities of people to the health effects of $PM_{10.}$
– Sensitivities of receptors to ecological effects.

The sensitivities for each area for all construction activities are outlined in Table 6.2.

*Table 6.2 Sensitivity of areas of concern for all construction activities*

| Activity | Description | Sensitivity |
|---|---|---|
| Sensitivities of people to dust soiling effects | – Six high sensitivity receptors (R02-R07) greater than 350 m from any construction activity.<br>– Two medium sensitivity receptors (R01, R08) greater than 350 m from any construction activity. | Low |
| Sensitivities of people to the health effects of $PM_{10\backslash}$ | – An annual background $PM_{10}$ concentration of 10.5 µg/m$^3$ was recorded from the Monash AQMS for the 2021 calendar year.<br>– Six high sensitivity receptors (R02-R07) greater than 200 m from any construction activity<br>– Two medium sensitivity receptors (R01, R08) greater than 350 m from any construction activity. | Low |
| Sensitivities of receptors to ecological effects. | – No high or medium sensitive ecological features within 50 m of the construction activity. | Low |

### Risk summary

The risk matrix uses the sensitivity and scale to determine the risk of dust impacts on the surrounding receptors. Table 6.3 outlines the risk levels determined for the construction of the proposal.

The risk identified during all stages of construction (demolition, earthworks, construction and track-out) was **Low Risk**.

Proposed specific mitigation measures and residual impacts are provided in Section 7.1 to further minimise the risk of dust impacts at receptor locations during construction works.

*Table 6.3 Risk matrix for dust impacts during construction*

| Impact | Risk | | | |
|---|---|---|---|---|
| | Demolition | Earthworks | Construction | Track-out |
| **Dust soiling** | Low risk | Low risk | Low risk | Low risk |
| **Human health** | Low risk | Low risk | Low risk | Low risk |
| **Ecological** | Low risk | Low risk | Low risk | Low risk |

Operation of the existing MRF would continue throughout construction of the proposed facility which may lead to some cumulative impacts. The key pollutant of concern from operation of the existing MRF is odour which would not cause cumulative impacts with the construction activities. There may be some dust emitted from operations however this is expected to be minimal and is not expected to materially contribute to the overall dust generation from the proposal site.

## 6.2 Operation emissions

The MRF would accept comingled recyclable materials delivered to the facility via recyclable material collection vehicles. The MRF would not be sorting or processing any putrescible or biodegradable wastes and as such odour emissions are expected to be minimal.

Materials to be sorted and recycled all have a low potential for odour and dust and are similar to existing recycling operations onsite. At the time the upgraded facility commences operation, it would need to process at least the

same volume as the existing facility of 65,000 tonnes per annum. This is expected to increase to 115,000 tonnes per annum by year 20 of operation in order to keep up with the increasing demand. Although the waste throughput is expected to increase, the new facility would have additional controls and would be enclosed meaning odour and dust impacts from the MRF are not likely.

The main potential for unmitigated air emissions associated with this type of recycling facility are:

– TSP from material loading and sorting and glass crushing.
– $PM_{10}$ from material loading and sorting and glass crushing.
– $PM_{2.5}$ from truck and machinery exhaust.
– Odour from any non-compliant loads/ material/ liquids.

A high level conceptual process flow chart is shown in Figure 4.1. The activities performed which may lead to low level emissions of odour or dust within the building are described in Table 6.4. As the facility would be enclosed there is minimal risk of particulates or odour being dispersed into the environment.

All access roads and onsite roads would be paved, therefore dust generated by vehicle movements is expected to be negligible.

***Table 6.4 Operation activities with potential for odour and dust emissions***

| Operation activities | Odour emissions | Dust emissions |
|---|---|---|
| Receival of co-mingled materials loaded onto conveyor | X | X |
| Receival of non-compliant loads and loads with increased odour | X | X |
| Removal of waste material and transfer to landfill | X | X |
| Removal of hazardous wastes such as gas bottles, fire extinguishers, car batteries etc. | X | X |
| Washing of glass and PET, HDPE | | X |
| Wastewater capture and reuse | X | |
| Granulating/shredding/pelletising of PET, HDPE | | X |
| Separation, crushing, screening and washing glass sand, to nominally less than 5mm | | X |
| Optical sorting to identify, separate, remove contaminants, quality control and bale paper and cardboard products | X | X |
| Baling processes in the CDS separated materials | | X |

The washing of glass and plastics would result in accumulation of suspended solids and dissolved solids, which would require managing to enable water reuse within the washing circuits. Glass and plastics would be sorted and any contaminated materials removed prior to washing, and wastewater would be highly diluted with minimal residual wastes such as beverage liquids compared to total water flows. All wastewater collection and treatment activities would be within enclosed facilities. Therefore, wastewater collection and treatment would be unlikely to be a source of offensive odours.

Drying of plastics and glass may involve the use of electric or natural gas heating. Emissions from combustion of natural gas are expected to be negligible in relation to emissions from the overall site and the adjacent industrial area.

Processing of plastics including granulating and shredding may result in emissions of particulates. This has been assessed as dust, and mitigation measures to minimise emissions and impacts are consistent with those recommended for other particulate emissions.

Processing of plastics may also include pelletising which would include heating and/or extrusion of plastics, subject to detailed design. This process has potential to emit a range of volatile organic compounds (VOCs) during heating/melting of plastics. Different plastics emit different amounts of each VOC. Higher temperatures during heating of plastics can result in higher emissions of VOCs. Approximately 2,000 tonnes of mixed plastics per year are processed at the existing facility, as well as 1,500 tonnes of PET and 1,000 tonnes of HDPE per year. The main plastic types expected at the proposed facility include PET, HDPE and PP. Assessment of emissions from pelletising requires information on the processing methods and mitigation measures to be implemented, which is

subject to detailed design. Therefore, emissions from this process have not been assessed here. Emissions from plastic processing can be captured and ducted to a pollution control unit to ensure discharged air meets relevant emission standards.

### 6.2.1 Risk assessment

The identified hazards have been assessed using a risk assessment based on definitions provided under ISO 31000 (ISO, 2018). The risk rating for each hazard was defined by the impact magnitude of emissions and the likelihood of emissions from each activity, as defined in Appendix A.

Pre- and post-mitigated risk ratings are presented in Table 6.5 as well as reference to specific mitigation measures which would help to mitigate the identified risk. Several other general mitigation measures which apply to the whole operation rather than each activity are described in Section 7.2. For the post-mitigated risk assessment, it has been assumed that these would be implemented as well as those specifically identified for each activity. These include setting up complaints management plans for both odour and dust, regular site inspections, air monitoring, etc.

With implementation of the described mitigation measures, risk from both odour and dust emission impacts are reduced to acceptable for all activities.

Details on the risk assessment methodology are provided in Appendix A. When reading the table below the risk of each task is defined as ‘acceptable’, ‘review’, or ‘unacceptable’ and defined as:

– ‘Acceptable’ indicates that no further management is required, although risks should be managed.
– ‘Review’ indicates the risk is tolerable and should be reduced as low as practicable.
– ‘Unacceptable’ indicates management is required.

*Table 6.5 Operational risk assessment*

| Operation activities | Pollutant | Pre-mitigation | | | Mitigation measure ID (refer Section 7.2) | Post-mitigation | | |
|---|---|---|---|---|---|---|---|---|
| | | Impact magnitude | Likelihood | Risk | | Impact magnitude | Likelihood | Risk |
| Receival of co-mingled materials loaded onto conveyor | Odour | Negligible | Likely | Review | G1 | Negligible | Unlikely | Acceptable |
| | Dust | Negligible | Likely | Review | G1 | Negligible | Unlikely | Acceptable |
| Receival of non-compliant loads and loads with increased odour | Odour | Slight | Occasional | Review | G1 | Slight | Unlikely | Acceptable |
| | Dust | Slight | Occasional | Review | G1 | Slight | Unlikely | Acceptable |
| Removal of waste material and transfer to landfill | Odour | Slight | Occasional | Review | G3 | Negligible | Unlikely | Acceptable |
| | Dust | Negligible | Unlikely | Acceptable | G3 | Negligible | Unlikely | Acceptable |
| Removal of hazardous wastes such as gas bottles, fire extinguishers, car batteries etc. | Odour | Moderate | Unlikely | Review | G1, G3 | Slight | Rare | Acceptable |
| | Dust | Moderate | Rare | Acceptable | G1, G3 | Slight | Rare | Acceptable |
| Washing of glass and PET, HDPE | Dust | Negligible | Likely | Review | D5 | Negligible | Rare | Acceptable |
| Wastewater capture and reuse | Odour | Slight | Likely | Acceptable | O1, O3, G10 | Slight | Rare | Acceptable |
| Granulating/shredding of PET, HDPE | Dust | Moderate | Likely | Review | D4, D5, D6, G10 | Slight | Rare | Acceptable |
| Pelletising of PET, HDPE* | Particulates/ VOC/Odour | Moderate | Likely | Review | G12 | Negligible | Unlikely | Acceptable |
| Separation, crushing, screening and washing glass sand, to nominally less than 5mm | Dust | Moderate | Likely | Review | D3, D4, D5, G10 | Slight | Unlikely | Acceptable |
| Optical sorting to identify, separate, remove contaminants, quality control and bale paper and cardboard products | Odour | Negligible | Unlikely | Acceptable | O4, G2 | Negligible | Rare | Acceptable |
| | Dust | Negligible | Unlikely | Acceptable | D5 | Negligible | Rare | Acceptable |
| Baling processes in the CDS separated materials | Dust | Negligible | Unlikely | Acceptable | D5 | Negligible | Rare | Acceptable |
| *this activity has not yet been confirmed to occur on the proposal site, subject to detailed design | | | | | | | | |

### 6.2.2 Separation distances

The ACT Government has published separation distance guidelines as one method of considering potential conflicts between incompatible land uses. These are recommendations only, and there is always opportunity for a proponent to demonstrate compliance with relevant legislative requirements through other methods. It is noted that separation distances are developed to minimise impacts that may occur when there are accidents, power failure, equipment failure (i.e. odour controls) or unusual meteorological conditions that may occur, as well as normal operation.

The ACT guidance (ACT Government, 2018) provides a recommended separation distance for the following activities which may be relevant for this type of facility:

– **Waste Transfer Stations** (i.e. collection, consolidation, temporary storage, sorting or recovering refuse or used materials prior to transfer for disposal or use elsewhere) as 300 metres.
– **Materials recovery facility** (i.e. collecting, dismantling, treating, processing, storing or recycling used or surplus materials) as 300 metres.

As discussed in Section 5.1, the nearest sensitive receptors are approximately 400 metres from the boundary of the MRF and as such comply with the specified separation distances. This indicates the proposed MRF would be considered low risk of causing impacts to air quality, even during an upset condition.

### 6.2.3 Cumulative impacts

While odour emissions are possible from the proposal, sampling during operation of the existing facility indicated that in general the MRF emits very little odour in comparison to processing of other waste materials such as at the landfill and Corkhills. The maximum odour intensity outside of the site boundary attributed to the MRF was ‘distinct’, while both the landfill and Corkhills had ‘strong’ intensity.

Additionally, previous modelling of odour emissions from the landfill and Corkhills undertaken as part of the FOGO assessment indicated that impacts are mainly located to the north of the landfill site, therefore the worst impacted receptor from these sources is the MacArthur residential area. The MRF is located at the southern edge of the proposal site where the expected worst impacted receptors are located in the Hume industrial area. Other receptors are not expected to be significantly impacted by either odour source.

The proposed FOGO facility would be located adjacent to the proposed MRF and would also have the potential to impact the Hume industrial area. Odour from the FOGO facility would be emitted from receival of waste material, composting processes, and storage of composted product. Air from the FOGO facility would be pumped through a biofilter and therefore is expected to have a different character to that from the MRF. Cumulative impacts are therefore considered unlikely.

The proposed MRF would be enclosed, would not process putrescible waste, and would have minimal processes which are considered a source of odour or particulates. The risk assessment in Appendix B found all proposed activities to be acceptable from an air quality perspective and separation distance guidelines show that receptors are outside the recommended distance where adverse impacts may occur.

Cumulative impacts from the proposal and the MLRMC are not anticipated.

# 7. Mitigation measures

## 7.1 Construction

General air quality mitigation and management measure for construction of the proposal are provided below:

– Prepare a dust control protocol that forms part of the Construction Environmental Management Plan (CEMP) to detail management measures, a method for recording dust complaints and monitoring requirements.
– On days with forecast and actual high winds (i.e over 10 m/s) reduce work effort accordingly if wind blown dust is observed to be leaving the site boundary.
– Plant and equipment should be maintained in good condition to minimise ignition risk, spills and air emissions that may cause nuisance.
– Dust suppression should be undertaken as required using water sprays, water extension agents, soil stabilising polymers or other media on:
    - Unpaved work areas subject to traffic or wind.
    - Spoil and aggregate stockpiles.
    - During the loading and unloading of dust generating materials.
    - Unpaved access tracks.
– If the works are creating levels of dust which may significantly impact on residential amenity, the works should be modified or stopped until the dust hazard is reduced to an acceptable level.
– On days with high background dust levels (due to fire or offsite dust events for example), increase dust mitigation in the form of watering or reduce dusty construction activities.
– Construction vehicles with potential for loss of loads (such as dust or litter) should be covered when using public roads.

## 7.2 Operation

No operational activities have been identified as having unacceptable risk, however several require review in order to reduce as low as practicable. Implementation of the following mitigation measures would help minimise emissions of dust and odour and reduce the risk to acceptable.

***Table 7.1 Operational mitigation measures***

| ID | Mitigation measure |
|---|---|
| Odour | |
| O1 | An odour complaints management procedure should be developed as part of the broader complaints management procedures to ensure that any complaints regarding odour are received by appropriate personnel and that potential issues can be investigated, and site practices adjusted accordingly. |
| O2 | If the works are emitting odour concentrations which may significantly impact the nearby receptors, the works should be modified or stopped until the odour hazard is reduced to an acceptable level. |
| O3 | Internal sealed site drainage system which leads to storage tanks or interceptors that can collect rainwater and any spillage. |
| O4 | Provision for the wrapping of odorous baled materials, and the recycling of those materials back through the MRF in the event they need further separation. |
| Dust | |
| D1 | A dust complaints management procedure should be developed as part of the broader complaints management procedures to ensure that any complaints regarding dust are received by appropriate personnel and that potential issues can be investigated, and site practices adjusted accordingly. |
| D2 | If required, implement a dust collector system in other areas which regularly emit large amounts of dust. |
| D3 | Implement a dust collector system for the glass crusher as this is likely to regularly emit large amounts of dust. |

| ID | Mitigation measure |
|---|---|
| D4 | If the works are emitting dust concentrations which may significantly impact the nearby receptors, the works should be modified or stopped until the odour hazard is reduced to an acceptable level. |
| D5 | To maintain dust levels the building regular sweeping and housekeeping practices should be undertaken. |
| D6 | Implement a dust collector system for the plastics processing area as this may emit fine particles. |
| General | |
| G1 | Promote household sorting practices. |
| G2 | Post-sort inspection of materials and isolation of potentially odorous materials. Removal and isolation of highly odorous wastes in a sealed storage bin prior to removal from site. |
| G3 | Covered storage of sorted materials. |
| G4 | Carry out regular inspections to monitor compliance with the air quality management strategy. |
| G5 | Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. |
| G6 | Display the head or regional office contact information. |
| G7 | Once operational, sampling of the proposal operations should be conducted to confirm assumptions made throughout this assessment. |
| G8 | An air monitoring program should be established to ensure workplace exposure limits are maintained. Sampling should be undertaken in each building biannually by a suitable professional in accordance with guidance from Safe Work Australia and relevant Australian Standards. |
| G9 | No activities, including stockpiling, should occur external to buildings. Building doors should remain closed at all times except when allowing vehicles to enter or exit. |
| G10 | Ventilation equipment and dust or odour control units (if required) must be operational and regularly maintained. Should any unit become faulty, production on those affected lines should halt immediately and not resume until emission control systems are fully operational. |
| G11 | Road sweeper to clean the perimeter of MRF. |
| G12 | Mitigation of emissions from plastic pelletising (if undertaken at the site) would be required to limit impacts from VOCs. The required mitigation should be identified subject to detailed design as it would need to consider the specific processing methods and plastic throughputs. In accordance with best practice, emissions control units would be recommended wherever VOC emissions may occur. In addition, all processes which may generate emissions would be located within fully enclosed buildings which would minimise impacts from any fugitive emissions. |

# 8. Conclusion

An air quality assessment was undertaken for the proposal. A qualitative assessment was completed for both construction and operation of the proposed facility.

The construction assessment was completed in accordance with the *Guidance on the assessment of dust from demolition and construction* (Institute of Air Quality Management, 2014). Four stages of construction (demolition, earthworks, construction and track-out) were assessed, taking into account the distance from any sensitive receptors. The risk identified during all stages of construction (demolition, earthworks, construction and track-out) was low risk.

Potential air emissions from the proposal were identified based on the proposal description and included particulates and dust from material loading, sorting and glass crushing and odour from any non-compliant loads.

A risk assessment for dust and odour impacts was completed for operation of the proposal. The pre- and post-mitigated risk was identified for each operational activity. Inclusion of the recommended mitigation measures reduced the risk to acceptable for all activities. Odour from the nearby facilities including the MLRMC landfill, Corkhills and the proposed Hume FOGO facility has been taken into account based on a review of the Hume FOGO odour assessment. No significant cumulative impacts are anticipated from operation of the proposal.

Potential VOC emissions from heating of plastics during processing have been identified, however assessment is dependent on detailed design and therefore these emissions have not been assessed here. Emissions from plastic processing can be captured and ducted to a pollution control unit to ensure discharged air meets relevant emission standards.

The proposed MRF would be enclosed, would not process putrescible waste, and would have minimal processes which are considered a source of odour or particulates. Cumulative impacts from the MRF and the MLRMC are not anticipated.

# 9. References


ACT Government, 1999. *Air Environment Protection Policy.* s.l.:s.n.

ACT Government, 2018. *Separation distance guidelinces for air emissions.* Canberra: s.n.

Adams, K. et al., 2011. *Development of Emission Factors for Polypropylene Processing.* s.l.:Journal of the Air & Waste Management Association.

Barlow, A. et al., 2012. *Development of Emission Factors for Polyethylene Processing.* s.l.:Journal of the Air & Waste Management Association.

Institute of Air Quality Management, 2014. *Guidance on the assessment of dust from demolition and construction.* London: Institute of Air Quality Management.

ISO, 2018. *Risk Management - Guidelines.* s.l.:s.n.

NSW Department of Environment and Conservation, 2006. *Technical framework - Assessment and management of odour from stationary sources in NSW.* s.l.:s.n.

NSW Department of Environment and Conservation, 2006. *Technical framework - Assessment and management of odour from stationary sources in NSW.* Sydney(NSW): Department of Environment and Conservation (NSW).

NSW EPA, 2016. *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales.* Sydney: State of NSW and Environment Protection Authority.

NSW EPA, 2016. *Approved methods for the modelling and assessment of air pollutants in New South Wales..* Sydney: s.n.

NSW EPA, 2022. *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales.* Parramatta(NSW): NSW Environment Protection Authority.

NSW EPA, 2022. *Approved methods for the sampling and analysis of air pollutants in New South Wales.* s.l.:s.n.

SLR Consulting Australia, 2021a. *ACT Odour Monitoring Round 2.* s.l.:s.n.

SLR Consulting Australia, 2021b. *ACT Odour Monitoring Round 3.* s.l.:s.n.

SLR Consulting Australia, 2022a. *ACT Odour Monitoring Round 4.* s.l.:s.n.

SLR Consulting Australia, 2022b. *ACT Odour Monitoring Round 5.* s.l.:s.n.

# Appendices

# Appendix A

## Risk Assessment Terminology

# A-1 Risk assessment definitions

The risk assessment methodology has been developed based on the definitions provided under ISO 31000 (ISO, 2018). Overall risk is dependent on the impact magnitude and the likelihood of each task. Impact magnitude ranges from 'negligible' to 'substantial'. The definition of each impact magnitude rating are given in Table A.1. Likelihood ranges from 'rare' to 'almost certain'. The definition of each likelihood rating are given in Table A.2.

***Table A.1 Impact magnitude***

| Magnitude | Description |
|---|---|
| Substantial | Impact is predicted to cause significant health and/or amenity consequences on the receiving environment.<br>Impacts would generate widespread nuisance complaints, resulting in regulatory action. |
| Major | Impact magnitude would cause statutory objectives/standards to be exceeded.<br>Impact would generate nuisance complaints, resulting in regulatory action. |
| Moderate | Impact would give rise to a perceivable health and/or amenity impact.<br>Impact would generate nuisance complaints, likely to require management but not result in regulatory action. |
| Slight | Predicted impact may be tolerated.<br>Impact would not generate nuisance complaints. |
| Negligible | Impact is predicted to cause no significant consequences.<br>Impacts would not generate nuisance complaints, and only perceptible within the site boundaries. |
| Eliminated | Impact eliminated.<br>Ranking only used when an identified hazard has been identified and eliminated. |

***Table A.2 Likelihood***

| Likelihood | |
|---|---|
| Almost certain | Expected to occur frequently.<br>Likely to occur often within the lifetime.<br>Occurs continuously. |
| Likely | Expected to occur regularly.<br>Will occur several times within the lifetime.<br>Will occur frequently. |
| Occasional | Expected to occur occasionally. May be described as 'possible'.<br>Likely to occur sometime in the lifetime.<br>Will occur several times. |
| Unlikely | Could occur occasionally.<br>Unlikely but possible to occur in the lifetime.<br>Unlikely but may be reasonably expected to occur. |
| Rare | May occur in exceptional circumstances.<br>So unlikely it may be assumed occurrence will not occur in the lifetime.<br>Unlikely to occur but possible. |
| Eliminated | Incapable of occurring.<br>Ranking only used when an identified hazard has been identified and eliminated. |

The overall risk takes into account both the impact magnitude and the likelihood, as defined in Table A.3. The risk of each task is then defined as 'acceptable', 'review', or 'unacceptable'.

– 'Acceptable' indicates that no further management is required, although risks should be managed.
– 'Review' indicates the risk is tolerable and should be reduced as low as practicable.

– ‘Unacceptable’ indicates management is required.

*Table A.3 Risk matrix*

| Likelihood / Magnitude | Negligible | Slight | Moderate | Major | Substantial |
|---|---|---|---|---|---|
| **Almost certain** | Review | Review | Unacceptable | Unacceptable | Unacceptable |
| **Likely** | Review | Review | Review | Unacceptable | Unacceptable |
| **Occasional** | Acceptable | Review | Review | Review | Unacceptable |
| **Unlikely** | Acceptable | Acceptable | Review | Review | Review |
| **Rare** | Acceptable | Acceptable | Acceptable | Review | Review |

# Appendix B

## Assessment of risk of dust impacts

The United Kingdom Institute of Air Quality Management's *Guidance on the assessment of dust from demolition and concrete* (Institute of Air Quality Management, 2014) (IAQM guidance) has been used to assess the risk of dust impacts from construction of the proposal on the surrounding environment. Step 2 of this guidance involves estimating the dust emission magnitude from four construction stages (demolition, earthworks, construction and trackout) and estimating sensitivity of receptors surrounding the proposal site.

The following definitions (shown in Table B.1) for small, medium and large dust emission magnitudes from each construction stage are examples provided in the IAQM guidance for how different activities may be defined. In each case, not all the criteria need to be met and other criteria may be justified if used in the assessment.

***Table B.1 Dust emission magnitude definitions from the IAQM guidance***

| Construction Stage | Dust emission magnitude | | |
|---|---|---|---|
| | **Small** | **Medium** | **Large** |
| **Demolition** | Total building volume <20,000 $m^3$, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10 m above ground. | Total building volume 20,000 $m^3$ – 50,000 $m^3$, potentially dusty construction material, demolition activities 10-20 m above ground level. | Total building volume >50,000 $m^3$, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20 m above ground level. |
| **Earthworks** | Total site area <5,000 $m^2$, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <20,000 tonnes, earthworks during wetter months. | Total site area 2,500 $m^2$ – 10,000 $m^2$, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m - 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes. | Total site area >10,000 $m^2$, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height, total material moved >100,000 tonnes. |
| **Construction** | Total building volume <25,000 $m^3$, construction material with low potential for dust release (e.g. metal cladding or timber). | Total building volume 25,000 $m^3$ – 100,000 $m^3$, potentially dusty construction material (e.g. concrete), on site concrete batching. | Total building volume >100, 000 $m^3$, on site concrete batching, sandblasting. |
| **Trackout** | <10 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m. | 10-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m | >50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m. |

Tables 2, 3 and 4 of the IAQM guidance define low, medium and high sensitivity to dust soiling effects, human health impacts and ecological effects, respectively. In all cases, the specific circumstances should be taken into account.

ghd.com

The Power of Commitment