EAQ Consulting

PROPOSED WANGARA INTERIM WASTE TRANSFER STATION (WTS) ODOUR IMPACT ASSESSMENT

CITY OF WANNEROO

Proposed Wangara Interim Waste Transfer Station (WTS) Odour Impact Assessment

CITY OF WANNEROO

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Environment | Air Quality

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1 Background

Environmental & Air Quality Consulting Pty Ltd (EAQ) was engaged by Talis Consultants Pty Ltd (Talis) on behalf of the City of Wanneroo (the City) to undertake a Works Approval Odour Impact Assessment (OIA) of the City's proposed Interim Waste Transfer Station (WTS) to be located at 86 Motivation Drive, Wangara Western Australia 6065 (the Site).

The WTS will be built within the redesigned Materials Recovery Facility (MRF) which is the existing infrastructure at the Site, i.e., the MRF will be repurposed to the WTS. The WTS will be adjacent to the City of Wanneroo's existing Greens Recycling Prescribed Premise at Lot 9005, 70 Motivation Drive, Wangara.

The lifespan of the interim WTS is expected to be five (5) years until a new facility is built for the City in an alternate location.

Following the final design and subsequent build of the WTS, the projected waste tonnages to move through the WTS for the 2029/30 period are:

- Recycling wastes: 20,000 tonnes per annum (tpa), and
- Residual wastes (for waste-to-energy): 80,000 tpa.

The proposed operational hours of the WTS are:

- 12 hours per weekday 6:00AM – 6:00PM,
- Saturdays as required also between the hours of 6:00AM – 6:00PM,
- Closed on Sundays, and
- Public holidays 6:00AM to 6:00PM (Excluding Christmas Day, Good Friday and New Years Day).

Daily truck movements are listed below.

Table 1-1: Daily Truck and Waste Type Movements

Waste Stream	Kerbside Collection Drop-off	Daily Semi-Trailer Pick-ups (Bulk Haulage)
Residual Waste	33	11
Recycling	13	13

For assessing malodour impacts from activities within the WTS, the residual waste will comprise of kerbside collections, i.e., red-lid residential waste bins. These wastes are putrescible and therefore odorous.

Recycling waste from kerbside is unlikely to pose any risk of malodour generation within the WTS.

Green waste is not included as an odour source in the OIA given that green's recycling is already a prescribed activity at the adjacent site.

1.1 OIA Regulatory Guidance

The Works Approval application process is regulated by the Western Australia (WA) Department of Water and Environmental Regulation (DWER) under Part V of the *Environmental Protection Act 1986* (EP Act). The OIA will support the City's application for Environmental and Works Approvals to construct and operate the WTS.

This OIA follows the most recent Government of WA DWER Guideline Odour Emissions June 2019 document where the Guideline provides assessment methods for delivering adequate odour data and information to the DWER for the assessment of applications under Part V of the EP Act; where, *"Part V Division 3 of the EP Act provides the Department with mechanisms for regulating odour, by way of conditions on works approvals and licences applied to prescribed premises".*

The DWER employs a risk-based approach to its assessment of applications for instruments under Part V of the EP Act.

In determining the risk posed by odour, DWER considers:

- the location, proximity and sensitivity of receptors;
- the management of odour sources and activities;
- the intensity and offensiveness of the odour;
- potential odour impacts from other nearby sources;
- the topography and complexity of terrain;
- the size and / or complexity of the facility when compared with other Australian operations;
- any unusual configuration of odour sources or technology compared with other Australian operations;
- whether the proposal is located in a Strategic Industrial Area (SIA);
- the presence of multiple industry categories which may emit odours on the same site;
- current and cumulative impacts from odour; and
- pathways and impacts on sensitive receptors.

As per the WA DWER Guideline the screening distance between a "Category 61A - Solid waste facility (1,000 tonnes or more per year)" and the nearest sensitive receptor is 500 metres, where the Category 61A activity involves *"….solid waste produced on other premises is stored, reprocessed, treated, or discharged onto land".*

On this basis alone, the WTS conforms with the recommended screening distance for odours given the nearest sensitive residential receptor (rural and/or urban) is approximately 600 metres to the northeast from the WTS.

Notwithstanding, this OIA provides a more detailed assessment to ensure all stakeholders are satisfied that the WTS activities will pose no risk of malodour impacts at the nearest sensitive receptor. Also, the detailed OIA will provide the necessary insight into the levels of protection provided during the operations of the WTS to mitigate near-field malodour impacts within the Wangara commercial and industrial precinct.

1.2 WTS Locality

The WTS is to be located within the Wangara commercial and industrial precinct which is approximately 17 kilometres (kms) north of the Perth Metropolitan CBD, 10 kms inland from the nearest coastline, and 20 kms west from the Darling Escarpment.

The terrain elevation of the WTS site is approximately 68 metres (m) Australian Height Datum (AHD). Within a 5 km radius surrounding the WTS the terrain relief is negligible (i.e., non-complex) with most of the land use being built up with either residential, commercial and/or industrial buildings. To the immediate north and within the northwest quadrant the land use is semi-rural comprising of larger lots for rural residential living, market garden growing lots, natural bushland/open space and public golf course.

To the west from the WTS, the terrain begins to decline by approximately 30 metres before rising again on a westerly heading. This 'depression' in the terrain may pose as channeling pathway where malodours may stagnant under calm and cool conditions, although the distance to this terrain depression is at least 2 kms and therefore unlikely to have any effect on odour dispersion in the near-field.

Under steady-state conditions, the meteorological conditions are assumed to remain constant during the dispersion pathway from emissions' source to receptor and therefore any odour plume is expected to incrementally disperse as it travels further downwind from the WTS.

Given the waste streams received at the WTS will be held and then loaded and transferred to other facilities for processing, the potential for these kerbside wastes to decompose and produce heightened malodours is unlikely. The residual wastes will be 'fresh', albeit with a malodour component to these wastes given they've typically been held in bins for up to one week before being collected and moved into the WTS.

The Locality of the WTS is illustrated in Figure 1-1 to follow.

Figure 1-2 presents the general layout design for the WTS, with Figure 1-3 illustrating the preliminary concept design.

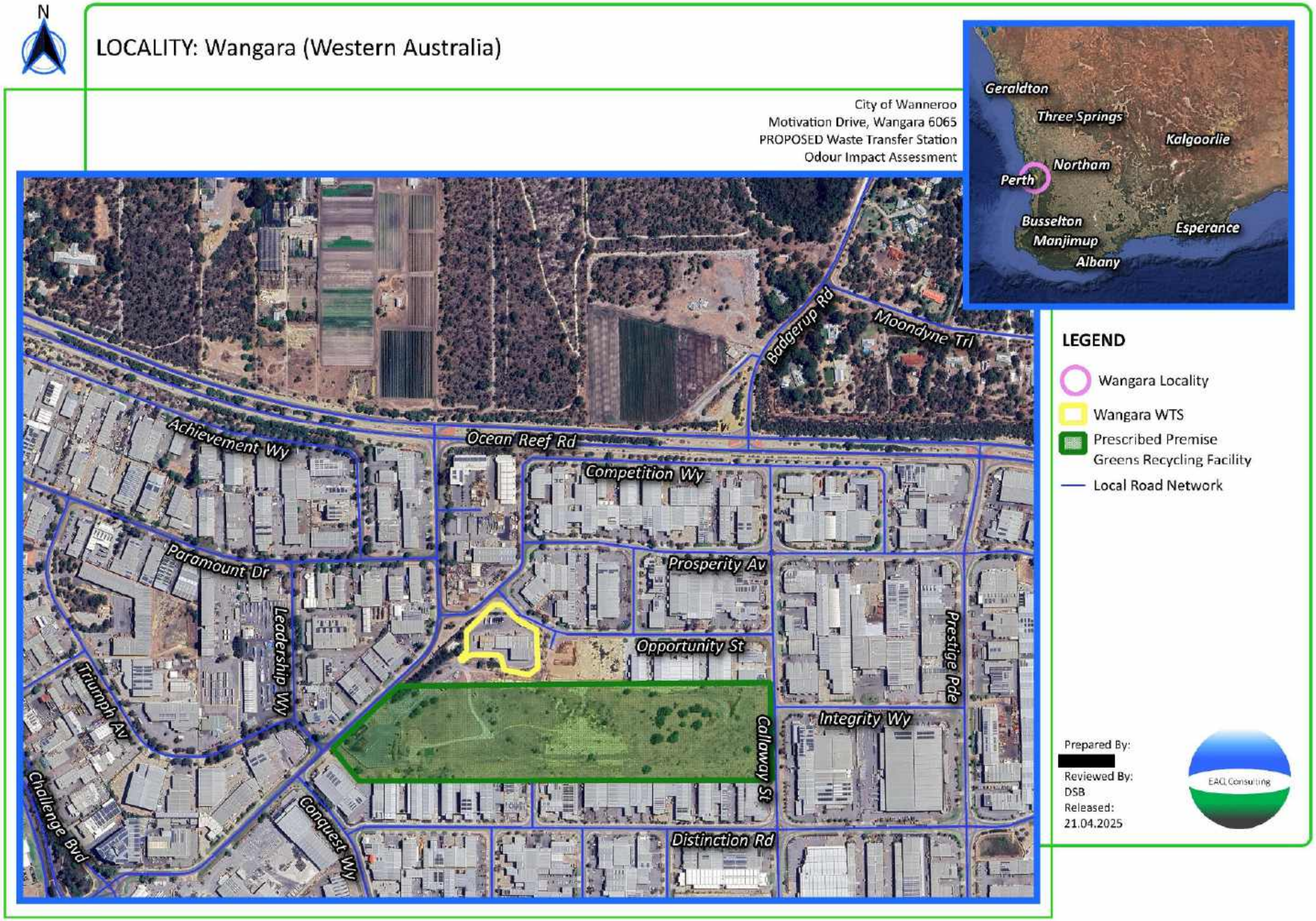


Figure 1-1: Wangara Proposed WTS

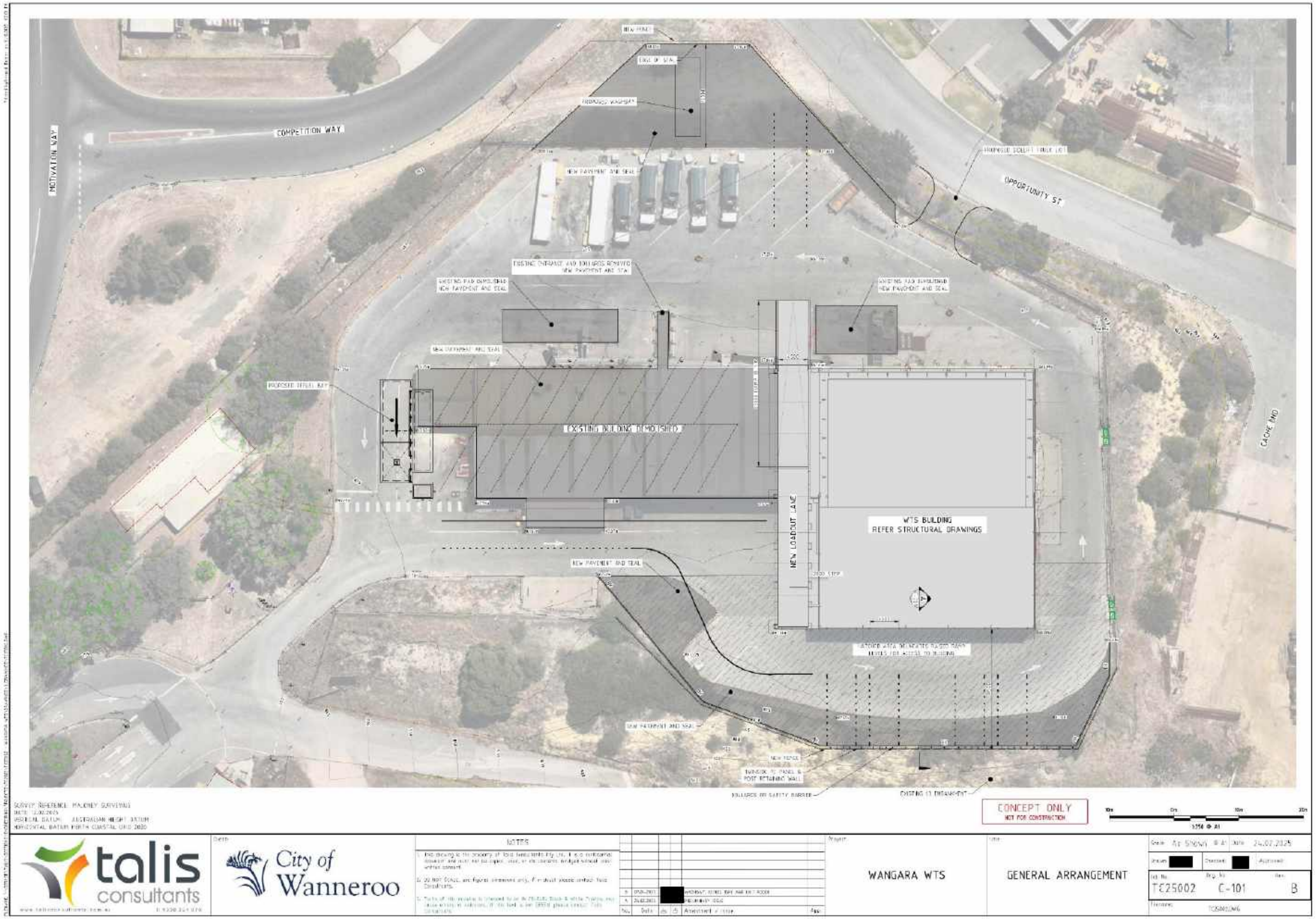


Figure 1-2: Current General Arrangement Design of Proposed WTS

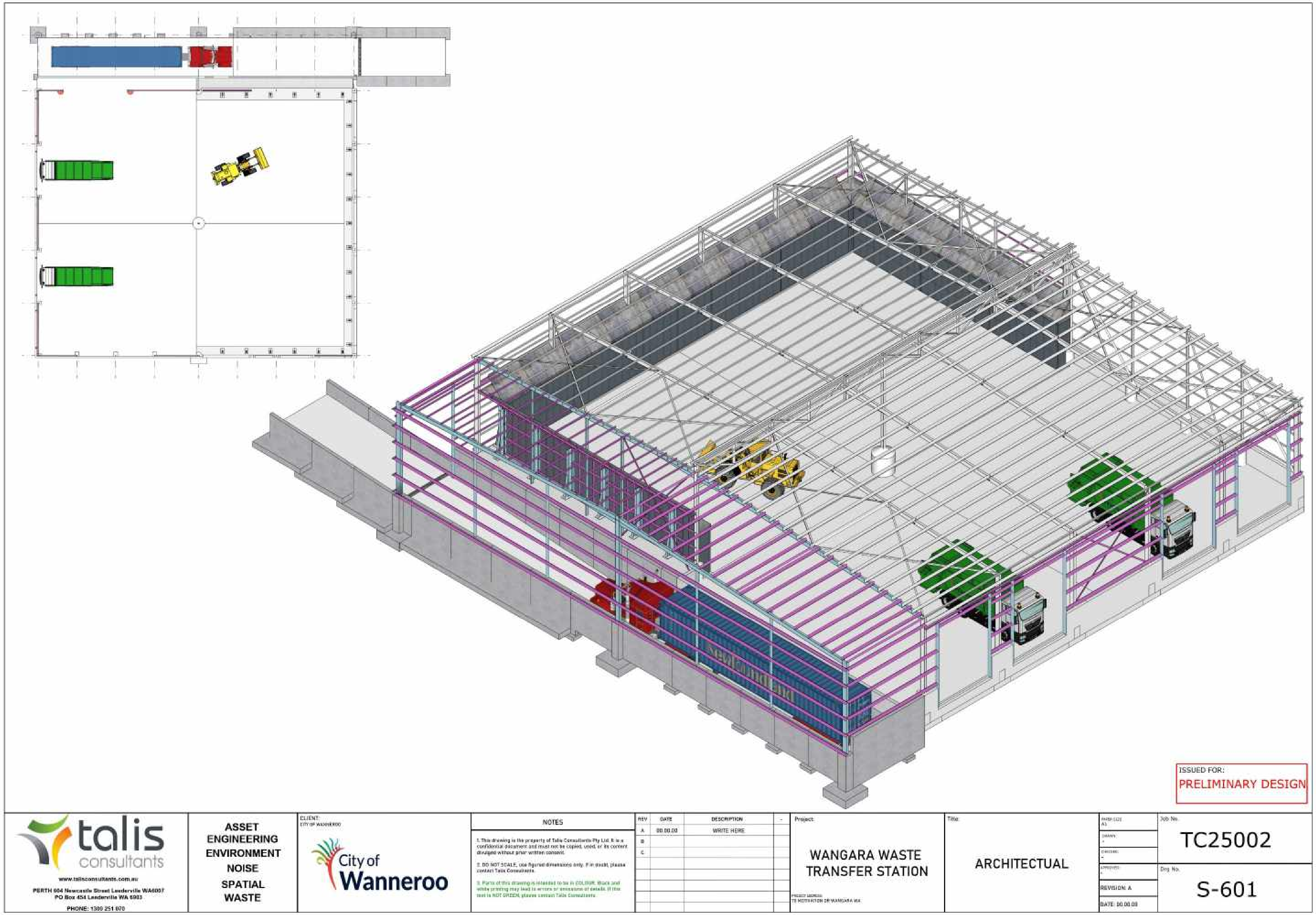


Figure 1-3: Current Preliminary Design of Proposed WTS

2 Detailed Odour Analysis

The WTS will be operational within the following days and times:

- 12 hours per weekday 6:00AM – 6:00PM,
- Saturdays as required also between the hours of 6:00AM – 6:00PM,
- Closed on Sundays, and
- Public holidays 6:00AM to 6:00PM (Excluding Christmas Day, Good Friday and New Years Day).

Incoming wastes received from 6:00AM – 6:00PM with peak times between 9:00AM – 10:00AM, and 12:00PM – 1:00PM.

Total trucks per day comprise of:

- Residual - 33, and
- Recyclable - 13.

During peak times the trucks per hour are:

- Residual - 17, and
- Recyclable - 7.

Odours from the WTS will originate from the drop-off and loadout (i.e. transfer) of residual waste. Residual waste will include comingled inert and putrescible waste streams from kerbside collections.

The odour characters within the WTS will reflect those odours typically observed from residential bins. The odour of rubbish/garbage is the prominent odour descriptor which represents General Refuse. During seasonal variations the hotter months can cause higher odour strength emissions due to the advanced decomposition of the waste within residential bins and the council collection trucks. Contamination of green wastes within the residential bin collection can further exacerbate odour strength emissions. Other odours from within a WTS are typically benign given those other co-mingles wastes are largely inert.

Incoming waste can be considered as ‘fresh’ and is held on the WTS floor for periodical timeframes between council collection drop-off and the closure of the WTS Site. The proposed management of the WTS aims to achieve nil putrescible waste retained on the WTS floor overnight and/or over weekends (i.e., clean floor policy). To achieve this waste is loaded in to waiting transport trucks for removal from the WTS. The WTS odour emission sources and pathways-to-atmosphere will be:

- Waste Vehicle ingress/egress doorways (4)
- Waste Receivals and Daily Storage
  - WTS floor receiving residual, putrescible waste, and
  - WTS floor receiving inert recyclables.
- Truck Loading/Loadout Bay (1)
- Sludge and Wash Leachate

- Washdown of WTS as required resulting in minor volumes of leachates, and
- Truck loading/loadout bay minor leachates from loading diverted into drain/sump.

All waste received on the WTS floor is mobilized into ‘sectors’ to ensure separation of residual waste and recyclables/inert wastes. Waiting waste removal transport trucks are loaded by front end loader within a dedicated loadout bay/lane.

2.1 Odour Emission Controls

The WTS will have an emission extraction system to control odour emissions and overcome fugitive odour losses. The system will comprise of:

1) 6 x extraction fans on the western face of the WTS to provide a combined extraction volume of 18,000 L/s, or 64,800 m^3/hr of odour and vehicle exhaust fumes from the activities involving waste receivals, waste movements using the front-end-loader, and loading of bulk waste removal trucks within the loadout lane, where:
    a. The volume of the WTS is 10,307 m^3,
    b. 6 x extraction fans will provide a total of 64,800 m^3/hr of extracted air, and
    c. The total air changes for the WTS will be approximately 6.3 per hour.

The extraction fans will be operated on a ‘clock’ that allows for operations when trucks are delivering waste to the WTS, and when loadout trucks are in the loadout lane and being loaded. The system will have manual override capabilities to ensure operations can run the extraction system as required based on waste on the floor of the WTS.

2.2 Operational Odour Analysis (OOA)

The following Operational Odour Analysis (Table 2-1) summarises the proposed WTS processes, sources of odour emissions, process controls, triggers and corrective actions and overall risk rating for odour impacts.

Table 2-1: Operational Odour Analysis (OOA) of Proposed WTS Operations & Odour Impact Potential

Odour Source	Dispersion Pathway to Nearest Receptor	Process Description	Emission Source	Process Control, Triggers & Corrective Actions	Corrective Action Evaluation	Contingency Actions	Residual Odour Impact Potential			
							Consequence	Likelihood	Impact Potential (onsite)	Impact Potential (urban receptor)
Waste Transfer Station (WTS)	The emission pathway to the nearest receptor is from stack odour emissions. There is negligible terrain influences nor complex meteorology. The nearest receptor is approximately 600 m to the northeast of the WTS	Incoming Refuse Collection Vehicles (RCVs)	During transit the trucks are closed/covered, and the odour emission source is negligible given it is contained	All waste trucks are covered. Weighbridge staff and operational personnel accept waste according to licence conditions and waste classifications	Non-conforming wastes are refused site entry	Not required	Minor	Rare	Low	Low
			RCVs unload putrescible wastes on the WTS floor. Initial displacement of an odour plume during deposition of the wastes. Wastes are stockpiled on the WTS floor to ensure separation from other non-putrescible wastes. The WTS is a volume source where odours are contained and extracted to provide negative pressure inside the WTS	6 x air-changes per hour to provide a total of 64,800 m^3/hr of air extracted along the western wall of the WTS, with supply air provided along the eastern wall via 4 x inlets. Wastes deemed highly odorous by operational personnel, such as Christmas food wastes, are cleared from the WTS floor ASAP into load-out truck. WTS floor washed down to remove leachates if/as required	Removal of these odorous wastes directly into the load-out truck ensures the risk of fugitive malodour emissions from the WTS floor are minimised	Covered load out truck, during standby, if the putrescible waste loads are highly odorous	Moderate	Rare	Medium	Low
		Deposited Sludge & Wash Down Leachate	Ground level liquid wastes that undergo vapourisation, in particular within the hotter seasonal periods	Liquid waste residues within the WTS will be managed in accordance with the City's leachate procedures and processes required to remove and contain liquid waste deposited on the WTS floor. Visually noticed sludge and leachates	Response protocols adhering to the City's procedures and processes	Not required given the settling pit/tank volume and low volumes of liquid waste required to be pumped from the WTS floor during a response	Minor	Rare	Low	Low
		Outgoing Bulk Waste Trucks	'Puffs' of odours during the loading of the bulk waste trucks within the loadout lane. Increased vehicle emissions and fumes from loader movements, bulk truck engine etc.	6 x air-changes per hour to provide a total of 64,800 m^3/hr of air extracted along the western wall of the WTS, with supply air provided along the eastern wall via 4 x inlets. Ensure the supply inlets (4) are operational and all intake louvres are open, ensure the 6 x extraction fans are operational. Cessation of loadout if fans off	Time-clock controls in use to activate the 6 x extraction fans and 4 x supply-air fans. Ensure fans operational	Cessation of loadout if fans off. Replacement impellers, motors and manual override of weather louvres as required	Moderate	Rare	Medium	Low

3 Local Meteorological Analysis

The nearest Bureau of Meteorology (BoM) Automatic Weather Station (AWS) that compares to the WTS's location with respect to distance from the nearest coastline and from the Darling Escarpment is the Perth Metro AWS. This AWS is approximately 14 kms SSW from the WTS.

Given the comparable location of the AWS to the WTS the local meteorology is not expected to differ markedly with respect to local terrain influences and coastal influences.

5 years of the most recent calendar data (2020 – 2024) for surface observations from the Perth Metro AWS was purchased, reviewed for erroneous data points, and sorted into a suitable format to reflect surface observations of:

i) wind speed,
ii) wind direction,
iii) surface temperatures,
iv) surface relative humidity,
v) rainfall, and
vi) station surface level pressure.

These six key meteorological parameters were used in the meteorological dataset development. Supplementary parameters were developed using CSIRO's TAPM (v 4.05) software for numerical upper air meteorological data.

TAPM was run using 41 x 41 (nx,ny) grid points, outer grid spacing of 30 kilometres (km), three subsequent nested grids, and 25 vertical levels. TAPM innermost nest was at 1.0 km resolution. The nested grid resolutions were close to a ratio of three as possible (30km, 10km, 3km and 1km), additionally:

a) 9-Second terrain height database,
b) TAPM default databases for land use and sea surface temperature (provided with TAPM software). Note that the default vegetation and soil type data may be modified if more representative site-specific data for the locality are available, and
c) Synoptic analysis data for the monthly/annual period(s).

The Aermet module of the Aermod computational software package was used to develop the multi-year (5yr) dataset representative of the WTS locality.

Figure 3-1 shows the annual and seasonal met characteristics for the 2020-2024 processed meteorological file, whilst Figure 3-2 shows the hourly meteorological characteristics.

Comparison of the Perth Metro AWS surface observations for temperature (Figure 3-3) and winds (Figure 3-4) to that of the TAPM outputs shows how TAPM can under/overestimate these parameters and therefore these surface observations were retained for the total meteorological dataset of 2020-2024.

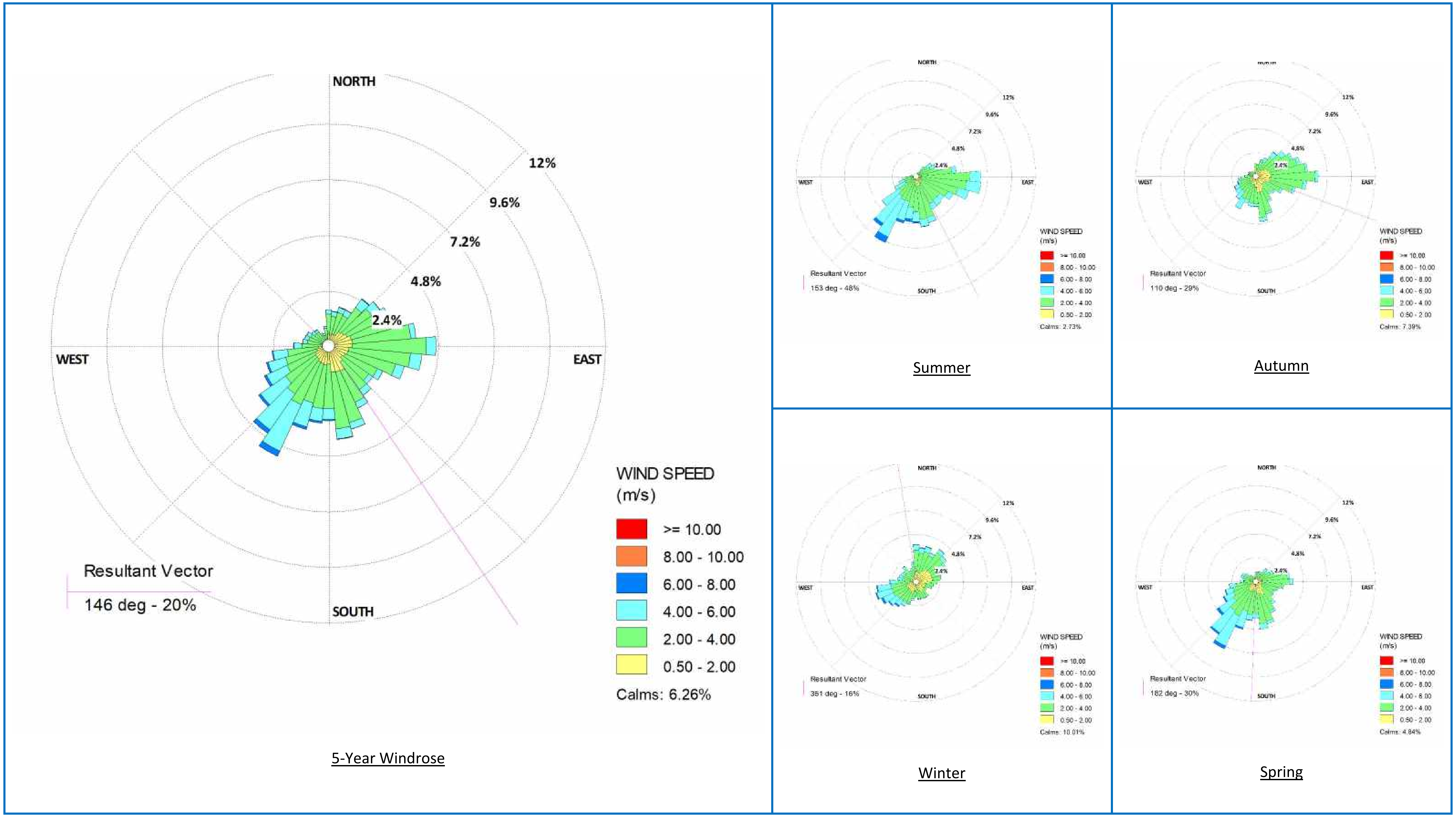
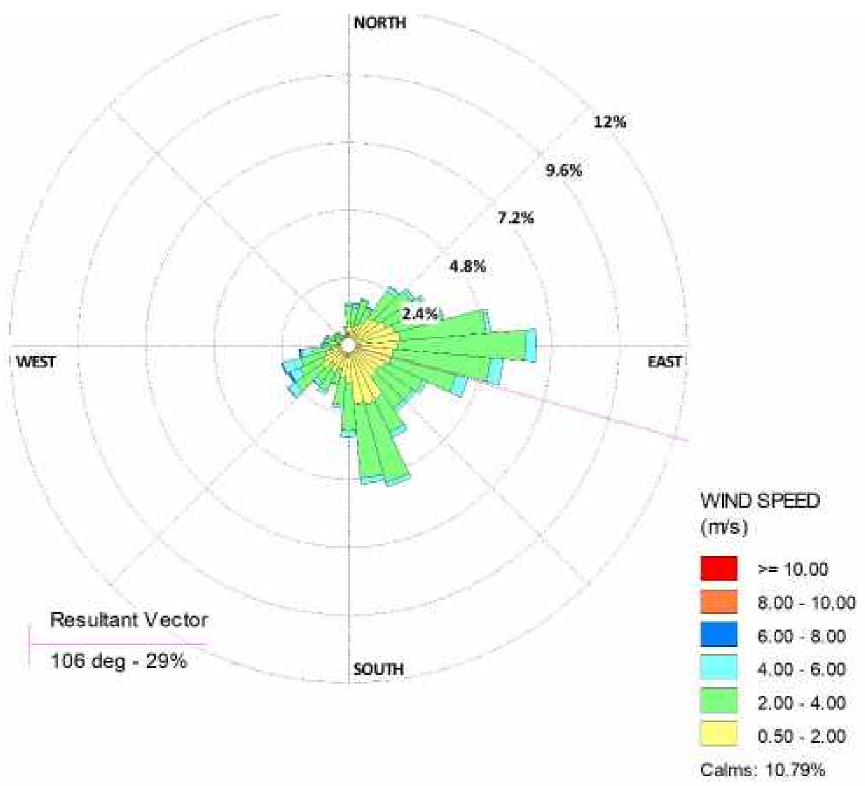
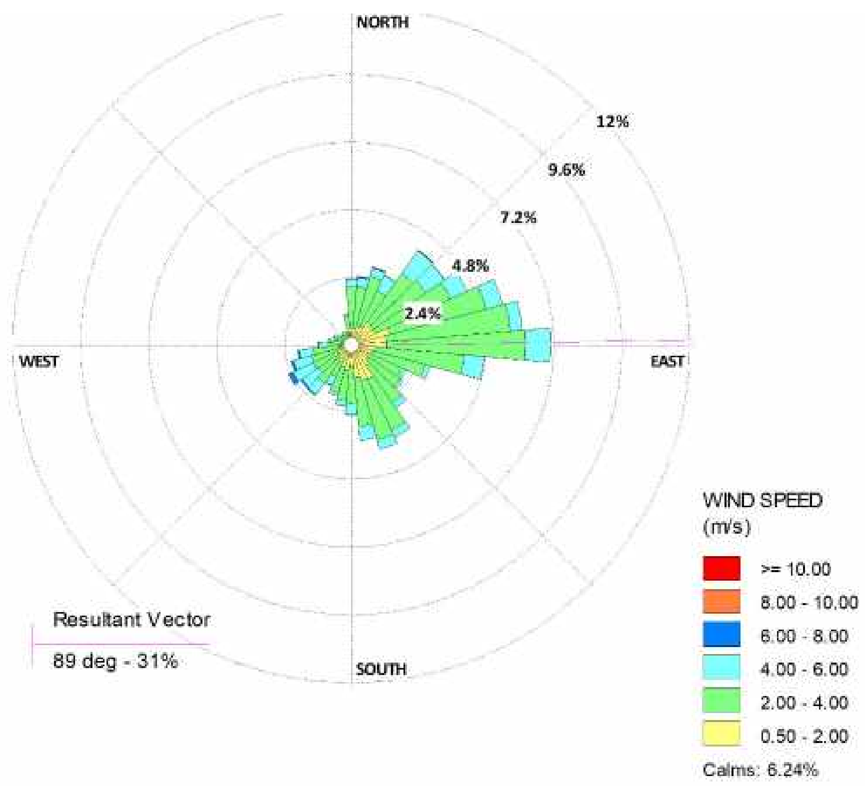


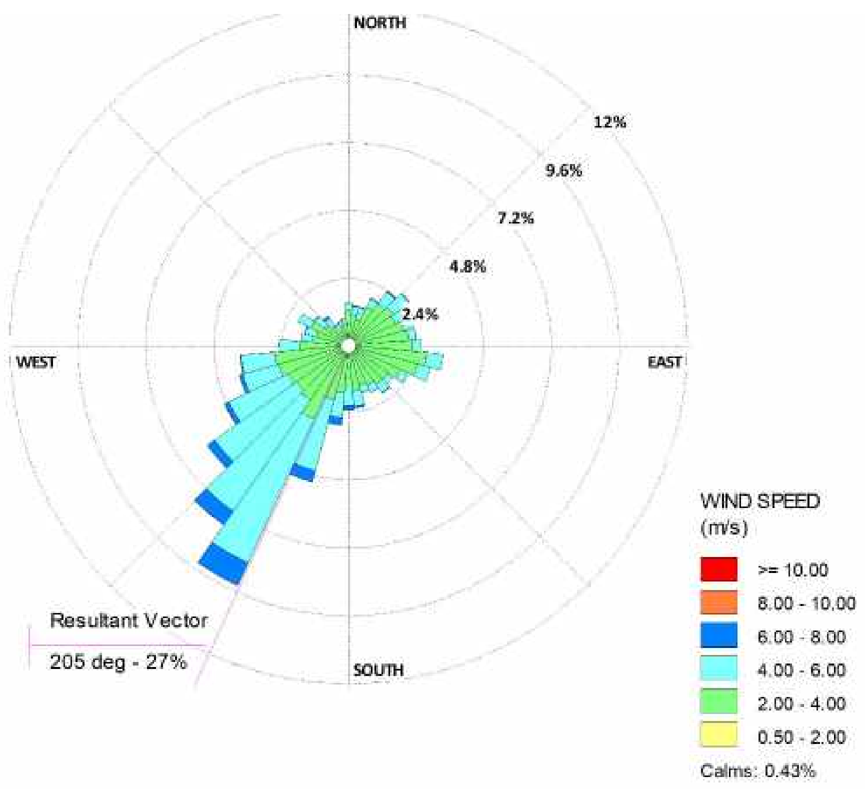
Figure 3-1: Annual and Seasonal Windroses for WTS Locality Meteorology 2020-2024



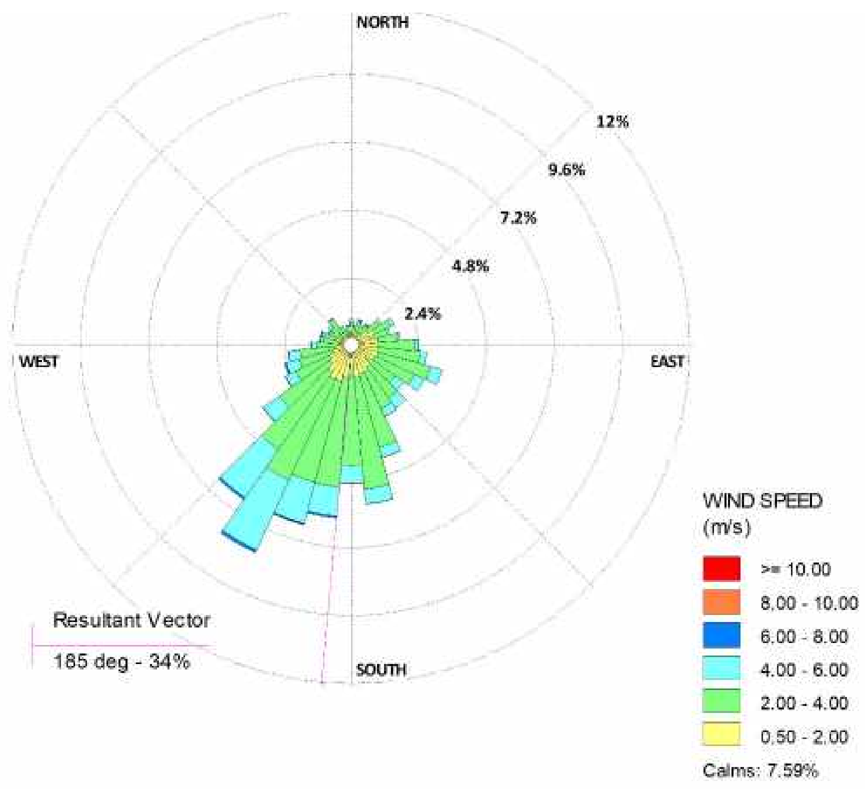
0100hrs – 0600hrs



0700hrs – 1200hrs



1300hrs – 1800hrs



1900hrs – 0000hrs

Figure 3-2: Time of Day Windroses for WTS Locality Meteorology 2020-2024

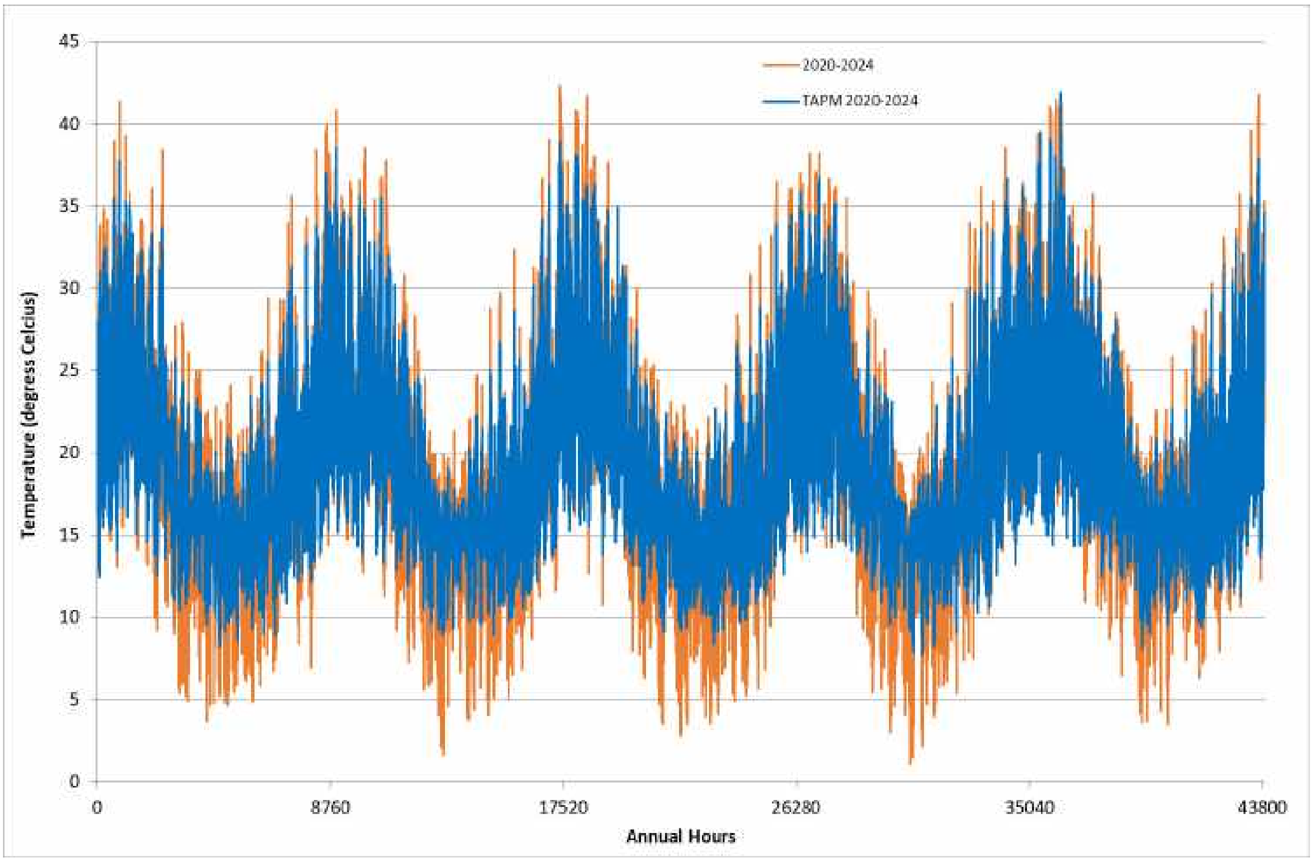


Figure 3-3: Comparison of 5-year temperatures for BoM AWS vs TAPM (2020-2024)

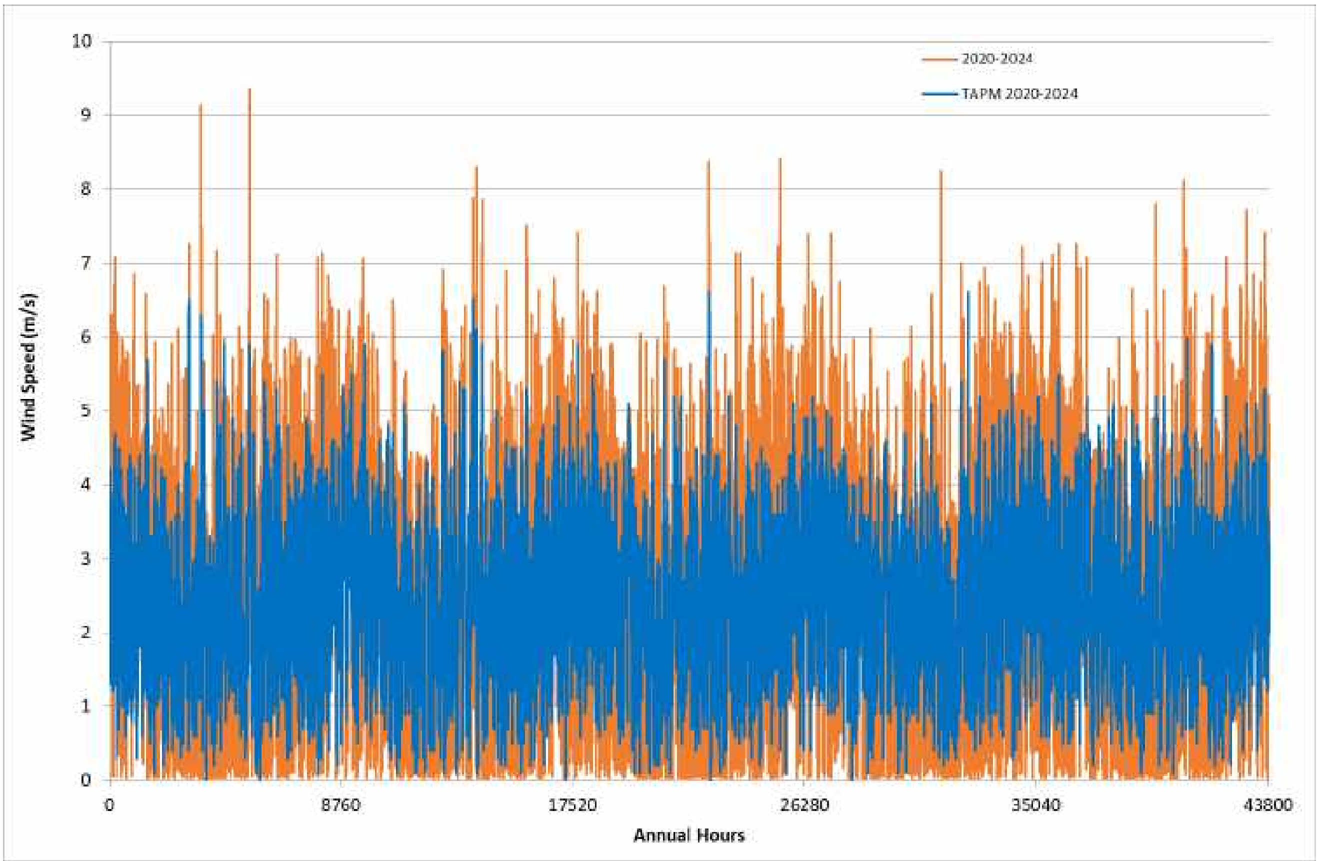


Figure 3-4: Comparison of 5-year winds for BoM AWS vs TAPM (2020-2024)

The prominent frequency of annual winds in the WTS locality is from the south-east as illustrated in the 5-year windrose within Figure 3-1. During summer the dominant frequency of winds also prevail from the southeast, and from the east-southeast in autumn. In winter the winds prevail from the north, and from the south during spring.

Given the WTS will only operate in daytime hours, the winds affecting odour dispersion will prevail from the east in the AM hours, and from the southwest during the PM hours.

Given these daytime winds, any loss of odours from the WTS will typically be pushed toward the west prior to noon and then shift to the northwest after lunch under a southwest wind pattern.

Given the separation distance to the nearest non-industrial/commercial sensitive receptor is approximately 600 metres, the large separation distance is likely to be more than adequate to provide sufficient protection from any daytime odour losses. Moreover, daytime hours typically provide less risk of malodour impacts given typically stronger winds and importantly the incidence of convective mixing where airflow moves vertically as the earth' s surface heats up during increases in daytime temperatures. Under convective mixing the odours move upward and are more readily dispersed. Outside of convective mixing there is mechanical mixing where grounded airflows collide with surface roughness structures (i.e., buildings, bushland etc) thus breaking up the odour plume and increasing dispersion of ground level odours.

Where the odour profile is relatively moderate-low and does not contain high-risk malodours of very high concentrations and readily observable odour thresholds, the moderate-low odours are 'easily' dispersed in the near-field as odour plumes collide with downwind obstructions (mechanical dispersion) and/or move vertically during convective dispersion.

4 Odour Emissions Evaluation - Modelling

4.1 Assessed Odour Emission Strengths

EAQ has been undertaking odour sampling and testing of WTS's throughout Australia for 20+ years.

The most comparable WTS within Western Australia that has regular odour data capture is located south of the river in Canning Vale. For the past 2-years (i.e., April '23 – April '25) the average strength of odours extracted from the Canning Vale WTS floor was 1,600 ou/m^3, within a range of odour strengths from 440 – 4,400 ou.m^3. The average odour strength of 1,600 ou/m^3 approximately represents the 75th percentile of the dataset.

- The 75th percentile odour strength was applied to the extraction volumes for each of the six (6) extraction fans, and
- For conservatism, the 90th percentile odour strength of 3,800 ou/m^3 was also assessed as emission from the six (6) extraction fans.

4.2 Aermod Configuration

The air emissions dispersion modelling impact assessment was carried out using the latest Gaussian Aermod Modelling Software. The methods for undertaking Aermod assessments are in accordance with the EPA Victoria publication documents 1550 and 1551.

Although this assessment has been undertaken for a site in WA, the EPA Victoria guidance is relevant in so much as the modelling setup and execution, where the Aermod system is the accepted Gaussian plume model that supersedes Ausplume according to EPA Victoria, as it contains (among others) advanced algorithms accounting for impacts that cause a plume to act in a non-Gaussian manner and more readily reflects emissions impacts affected by terrain within the modelling domain.

Presently, the WA DWER guidance for dispersion modelling is under review and subsequently the existing guidance from 2006 for Dispersion Modelling has been adopted where relevant.

An example of the Aermod input configuration is presented in Appendix A.

Aermod options and assumptions were:

- All emissions sources were modelled as stack sources,
- Surface observations taken from BoM AWS, and Upper air meteorological data generated by TAPM were processed and assimilated using Aermet,
- Terrain information obtained from Shuttle Radar Topography Missions (SRTM1), at 30 m resolution,
- Pollutant concentrations were modelled across uniform gridded receptors, and
- The model domain of 10 km^2 was assessed for odour emissions during operational daytime hours.

4.2.1 Aermet

Aermet options and assumptions were:

- Threshold wind speed of 0.5 m/s was used;
- Adjust surface friction velocity (ADJ_U*) option was used for low winds; and
- Adjust horizontal meander was used for low winds.

TAPM parameters were extracted and supplemented the surface BoM AWS data for the locality. Wind speed, wind direction, temperature, relative humidity, rainfall and surface pressure were all taken directly from the surface BoM AWS observations and TAPM was used to gap-fill as required.

The key TAPM upper air parameters that were input into the Aermet module were:

- Net Radiation (NRAD)
- Total Solar Radiation (TSR)
- Mixing Height (ZMIX)
- Surface Friction Velocity (USTAR)
- Temperature Differential (DT01)

Surface characteristics are needed to supplement the meteorological parameters and thus allow Aermet to produce surface and upper profile meteorological data ready for modelling. Surface characteristics of land use and roughness are developed within the aersurface utility in Aermet.

4.2.1.1 Aersurface Processing

Aersurface was run with four sectors which are listed in Table 4-1.

For sector 1, the surface roughness was reduced to reflect the semi-rural, non-urban setting in that sector, and therefore less mechanical obstructions resulting in a lower surface roughness.

Table 4-1: Aersurface Parameters

Sector	Angle	Albedo	Bowen Ratio	Surface Roughness (Zo)
1	0 - 90	0.18	1.11	0.056
2	90 – 180	0.18	1.11	0.3
3	180 – 270	0.18	1.11	0.3
4	270 - 0	0.18	1.11	0.295

- The surface roughness (length) relates to the height of obstacles and is a factor in determining the magnitude of mechanical turbulence and the height of the mechanically generated boundary layer. Surface roughness length was minimised to reflect a conservative assessment,
- Albedo refers to the fraction of total solar radiation reflected by the Earth's surface back to space with no absorption, and
- The Bowen Ratio has reference to the Earth's surface moisture and utilised in determining the planetary boundary layer parameters for convective conditions.

4.2.2 Dispersion Modelling Limitations

By definition, air quality models can only approximate atmospheric processes. Many assumptions and simplifications are required to describe real phenomena in mathematical equations. Model uncertainties can result from:

- Simplifications and accuracy limitations related to source data;
- Extrapolation of meteorological data from selected locations to a larger region; and
- Simplifications to model physics to replicate the random nature of atmospheric dispersion processes.

Models are reasonable and reliable in estimating the maximum concentrations occurring on an average basis. That is, the maximum concentration that may occur at a given time somewhere within the model domain, as opposed to the exact concentration at a point at a given time will usually be within the ±10% to ±40% range (US EPA, 2003).

Typically, a model is viewed as replicating dispersion processes if it can predict within a factor of two, and if it can replicate the temporal and meteorological variations associated with monitoring data. Model predictions at a specific site and for a specific hour, however, may correlate poorly with the associated observations due to the above-indicated uncertainties. For example, an uncertainty of 5° to 10° in the measured wind direction can result in concentration errors of 20% to 70% for an individual event (US EPA, 2003).

4.3 Odour Dispersion Modelling Results

The assessment of odour emissions using Aermod dispersion modelling was evaluated against the 99.5th percentile of the entire meteorological dataset (2020 – 2024). This percentile is in accordance with the Odour Guideline (2019).

Based on the two odour modelling scenarios where the 75th percentile odour strength, and the 90th percentile odour strength, were applied to each of the six (6) extraction fans, and those fans emitted the untreated odours at a height of approximately 1 metre above the WTS building roofline, the projected ground level odour strengths during the daytime operational hours of the WTS are presented in Figure 4-1 and Figure 4-2.

When assessing the 90th percentile odour strength value as the odour emissions profile (refer Figure 4-2), ground level odour strengths of 2 ou.m^3 or more are still projected to be retained within the Wangara Industrial Area.

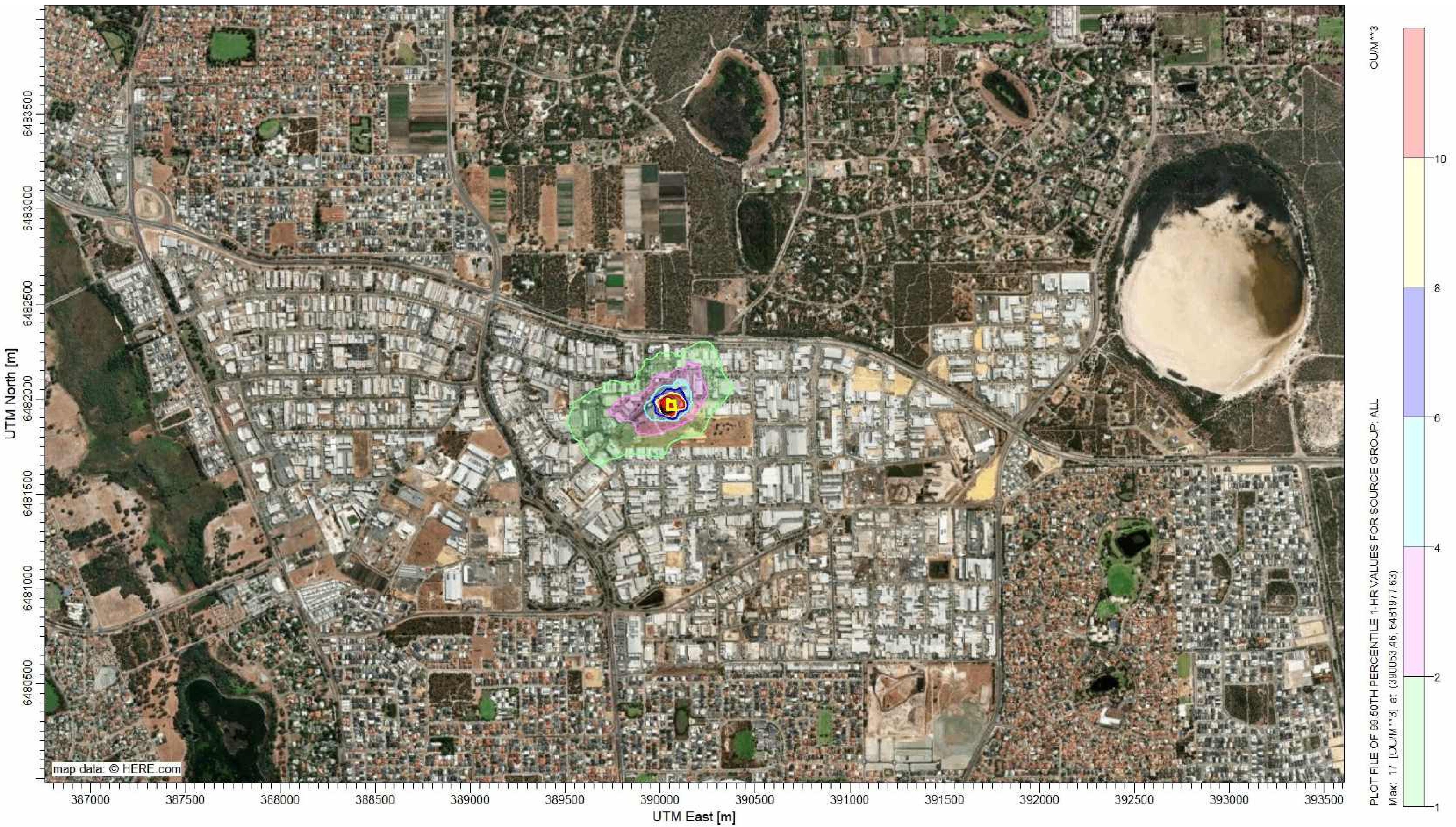


Figure 4-1: Aermod Projected Ground Level Odour Contours for 75th Percentile Odour Strength from WTS Stacks

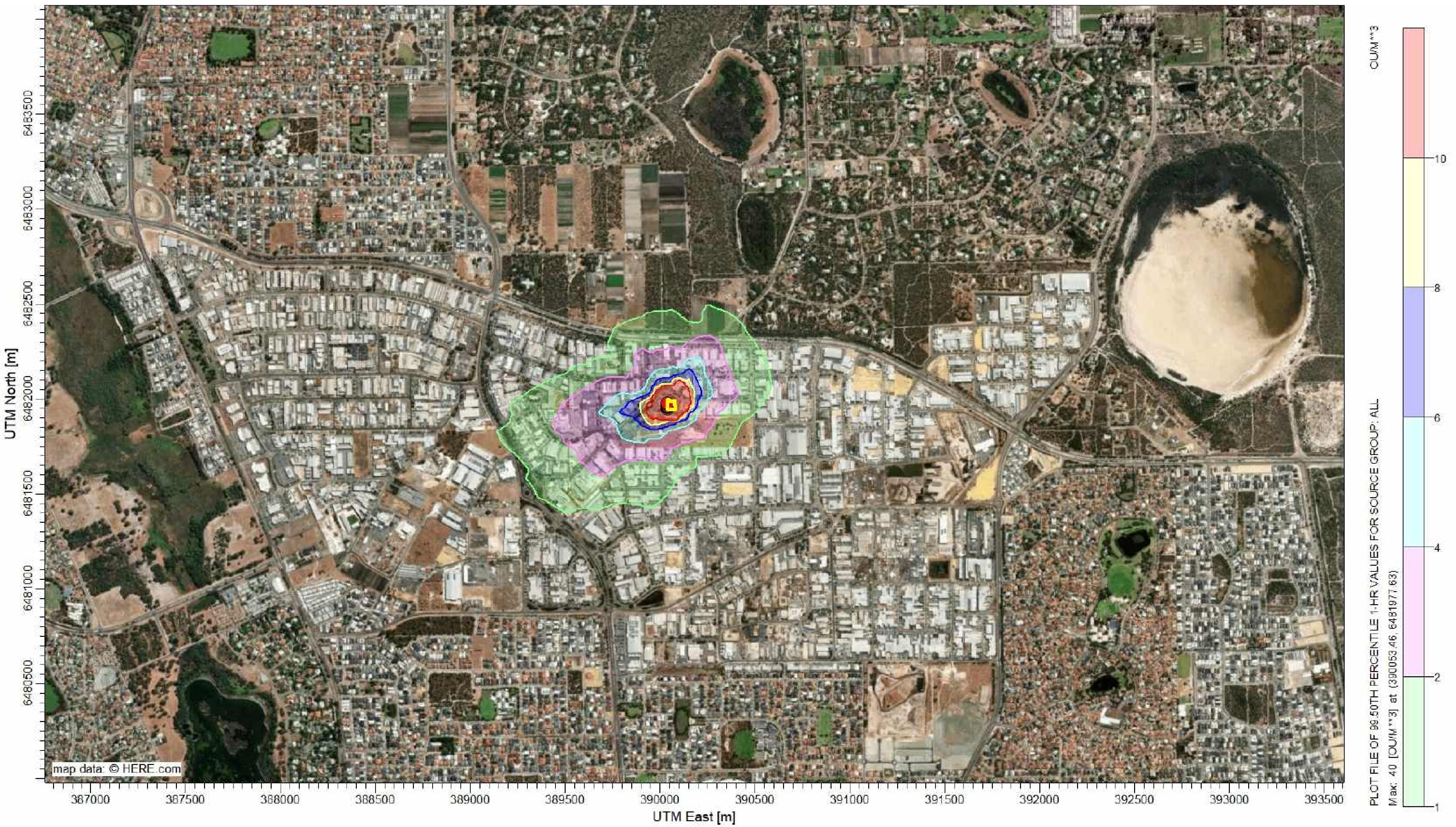


Figure 4-2: Aermod Projected Ground Level Odour Contours for 90th Percentile Odour Strength from WTS Stacks

5 Risk Evaluation

5.1.1 Wangara Industrial Area

In consideration of the DWERs' Guidance Statement: Risk Assessments (2020), the proposed WTS, assuming release of WTS odours from 6 x roof exhaust stacks, under normal procedures, the *Consequence* of odour impacts at the nearest commercial and/or industrial receptor within the Wangara Industrial Area is in the view of EAQ Moderate; where:

- Onsite impacts: **mid level**,
- Offsite impacts local scale: **low level**, and
- Offsite impacts wider scale: **minimal**.

And, the *Likelihood* of the risk occurring is Unlikely, where:

- The risk event will probably not occur in most circumstances.

Based on this assessment of the risk criteria under an exceptional event where uncontrolled odours are released to the environment; the future risk is considered to be **Medium**.

On this basis the Risk Treatment would therefore be:

- Acceptability – *"Acceptable, generally subject to regulatory controls",* and
- Treatment – *"Risk event is tolerable. We may apply some regulatory controls, including outcome-based conditions where practical and appropriate".*

5.1.2 Nearby Residential Areas

Assuming release of WTS odours from 6 x roof exhaust stacks, under normal procedures, the *Likelihood* of the risk occurring at the nearest residential (urban) receptor is Rare, where:

- The risk event may only occur in exceptional circumstances.

Based on this assessment of the risk criteria under an exceptional event where odours are released to the environment; the future risk is considered to be **Low** within the surrounding residential areas.

5.1.3 Risk Evaluation Conclusions

Given the large separation distances between the WTS and the nearest residential receptor and further considering that odours from the WTS will only be released during daytime hours on weekdays, the risk of a malodour event at the nearest residential receptor that may result in an odour complaint is **Low**, and therefore the siting of the WTS adjacent to the existing Wangara greens recycling facility is appropriate.

Some WTS odours may be observed within the Industrial Area, however; these odours are unlikely to pose a nuisance given odours are only emitted during daytime hours where daytime dispersion of those odours is in general heightened resulting in low odour concentrations at ground level.

6 Summary Table for Detailed Analysis

Detailed analysis tools	Tick if used	Comments
Emission source		
Operational odour analysis (OOA) (priority tool)	☒	Table 2-1
Odour source assessment (OSA)	☐	n/a
Pathway and receptor		
Location review	☒	WTS Locality
Meteorological Review	☒	Local Meteorological Analysis
Odour field assessment (OFA)	☐	n/a
Complaints data analysis	☐	n/a
Community surveys	☐	n/a
Comparative dispersion modelling	☒	Odour Emissions Evaluation - Modelling
Comparison with similar operations	☒	Assessed Odour Emission Strengths

Appendix A – Aermod Configuration Pathways