



# SUEZ – Wetherill Park RRF Odour Audit

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## Signature Page

15 May 2020

# SUEZ – Wetherill Park RRF Odour Audit



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## 1. INTRODUCTION

### 1.1 Background

SUEZ Recycling and Recovery (SUEZ) have received consent from the Department of Planning, Industry and Environment (DPIE) to increase the licence capacity of their existing Wetherill Park Resource Recovery Facility (WPRRF) located at 20 Davis Road, Wetherill Park (the 'site'). As part of the consent provided by DPIE, SUEZ is required to carry out an odour audit of the development within six months after the commencement of the expanded operations at the facility. Specifically, the consent requires the following:

#### Odour Audit

- B16. The Applicant must carry out an Odour Audit of the Development no later than six months after the commencement of expanded operations. Division 2B of Part 6 of the EP&A Act applies to this audit which is for the purpose of validating the odour data used in the EIS. The audit must:
- (a) be carried out by a suitably qualified, experienced and independent person(s), whose appointment has been endorsed by the Secretary;
  - (b) audit the Development in full operation;
  - (c) include a summary of odour complaints and any actions that were carried out to address the complaints;
  - (d) validate the Development against odour impact predictions in the EIS and the RTS;
  - (e) review the design and management practices in the Development against industry best practice for odour management;
  - (f) identify suitable odour mitigation options and controls, including but not necessarily limited to:
    - i. mechanical ventilation;
    - ii. operation of the building under negative pressure to minimise fugitive emissions; and
    - iii. odour capture and control options.
  - (g) include an action plan that identifies and prioritises any odour mitigation measures that may be necessary to reduce odour emissions.

The following report summaries the methodology and results of the odour audit conducted by ERM to satisfy the development consent requirement.

### 1.2 Scope of work

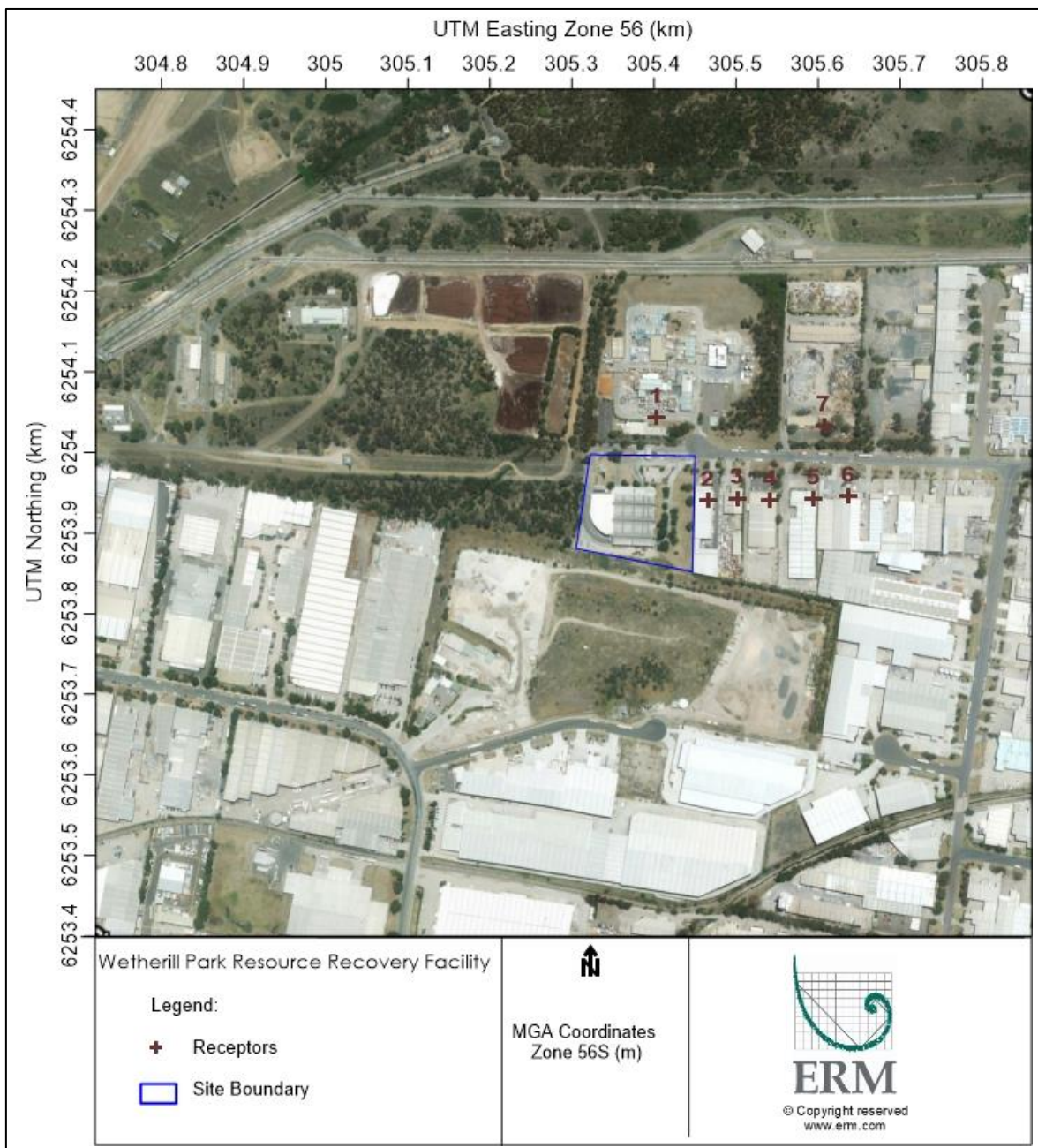
The scope of work for the odour audit included the following tasks:

- Review and summarise odour complaint and response data (prior to the site visit).
- Conduct a site visit over two consecutive days when the site is fully operational that will include a site odour audit and field odour observations.
- Undertake a site odour audit that will identify and prioritise odour sources as well as inspect current odour mitigation measures at the site.
- Validate odour impacts against EIS and RTS predictions through odour observations in surrounding community.
- Review the site design and management practices and compare with industry best practice for odour management.
- Based on the outcome of the audit, prepare an action plan that identifies and prioritises any odour mitigation measures if required.
- Prepare an odour audit report for submission to regulatory body.

## 2. SITE DESCRIPTION

SUEZ WPRRF is located at 20 Davis Road, Wetherill Park and currently operates as a resource recovery facility, receiving General Solid Waste (putrescible) and General Solid Waste. Following an environmental and developmental assessment, WPRRF has received approval to increase its operating hours and capacity of putrescible waste.

The identification of receptors was undertaken as part of odour assessment report (Pacific Environment, 2016) that was prepared as part of the Environmental Impact Assessment (EIA). The closest receptors to the WPRRF are commercial properties with residential properties located further away (approximately 1.5 km). Nearby commercial receptors identified as part of the Environmental Impact Statement (EIS) are presented in Figure 2.1.



**Figure 2.1: SUEZ WPRRF and receptors**

### 3. COMPARISON TO ODOUR IMPACT PREDICTIONS

#### 3.1 Complaint Data analysis

Odour complaints are maintained within the SUEZ odour complaint database (SIMS). There have been no odour complaints received by SUEZ in regards to the WPRRF (J Simmons 2020, personal communication 20 February).

#### 3.2 Field Odour Surveys

##### 3.2.1 Survey Methodology

The odour surveys were conducted using a methodology based on extensive work performed in Queensland, as summarised in Ormerod and Grocott (2002) and Ormerod et al. (2002). The methodology used is a modified form of the German VDI 3940 (1993) method for odour surveys. This method standardises the odour logging and analysis approach by the adoption of a standard scale for describing odour intensity that is detailed in German Standard VDI 3882 (I) which relates to odour measurement.

For this assessment, an observer who has a sense of smell which meets the requirements of AS4323.3 (Standards Australia, 2001) conducted the field odour surveys. Stationary 10-minute surveys were conducted where the odour intensity and offensiveness, as described in Table 3-1 and Table 3-2, were recorded every 10-seconds by the observer.

In addition to making intensity and offensiveness observations, the observer also notes the character of the odour/odours observed, if that can be determined. Generally, the observations are focussed on the targeted odour/odours. If other relevant odours or background odours are present in significant intensities this is also noted and recorded as appropriate.

**Table 3-1: Odour intensity scale from VDI 3882**

Perceived odour strength	Intensity level rating	Interpretation
Extremely strong	6	In normal circumstances, this should be very rare in a field situation. For an offensive type of odour, the reaction would be to immediately mitigate against further exposure. This remains the dominant thought and motivation until the exposure level is reduced. The odour cannot be tolerated.
Very strong	5	The odour character is clearly recognisable. For an offensive type of odour, exposure to this level is considered unpleasant/undesirable to the point that action to mitigate against further exposure is considered or taken.
Strong	4	The odour character is clearly recognisable. For an offensive type of odour, exposure to this level would be considered unpleasant/undesirable.
Distinct	3	The odour character is clearly recognisable. Note that this must still apply even if in a different context or situation - for example, not knowing or expecting what type of odour may be present. The odour is tolerable – even for an offensive odour.
Weak	2	The assessor is reasonably sure that odour is present but not 100% sure of the odour character.
Very weak	1	The odour character is not recognisable. There is probably some doubt whether the odour is actually present. A useful strategy where the odour is borderline between “not perceptible” and “very weak” is to alternate such observations between 0 and 1.
Not perceptible	0	No odour.

Note: descriptors were derived by David Pitt (2014) and are consistent with the “distinct” definition in DEHP (2013).

**Table 3-2: Odour offensiveness scale**

Perceived odour offensiveness	Offensiveness rating	Interpretation
Extremely Offensive	6	Unbearable effects. Immediately intolerable. Extremely strong effects such as retching, fainting or other adverse effects on physical well-being caused by exposure
Strongly Offensive	5	Causes almost immediate attempts to avoid OR Causes noticeable physiological effects following exposure e.g. pronounced nausea, feeling faint headed.
Strongly Offensive	4	Repulsive. Disgusting. Strongly displeasurable to sense of smell. Would soon elicit attempts to avoid exposure OR Causes slight physiological effects following exposure e.g. pronounced nausea, feeling faint headed.
Offensive	3	Causes recognisable displeasure to sense of smell, may be bearable for short exposure, but reluctance to submit oneself to longer exposures is likely. For a 'chemical' smell caused by substances hazardous to humans at relatively low levels, a response of worry is reasonably elicited (e.g. due to it being not practicable to avoid), but without any other physiological responses. Long-term exposure may cause stress-like symptoms
Slightly unpleasant	2	Faintly unpleasant, but easily bearable even for prolonged exposure
Neutral	1	Odour is not perceived as pleasant, but is also not even slightly unpleasant
Pleasant	0	Odour perceived as pleasant to some degree

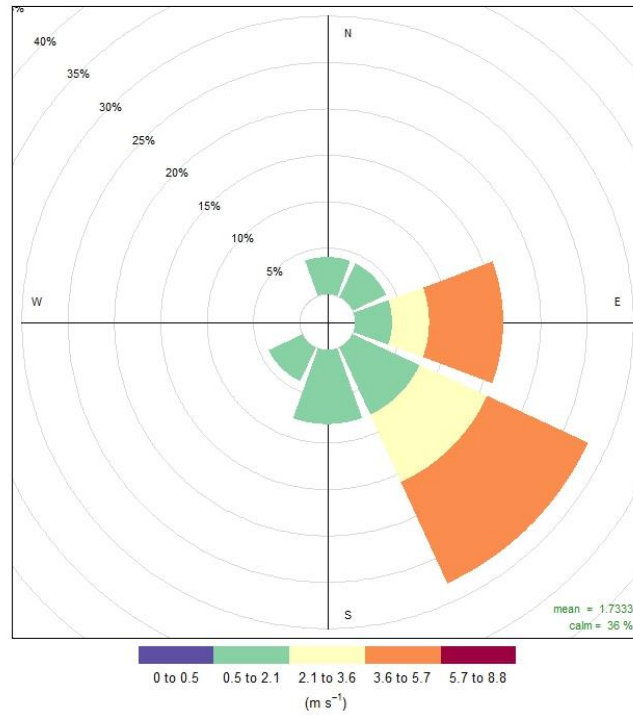
### 3.2.2 Meteorological Data

The locations for the field survey were selected to cover downwind locations, various distances from the targeted odour source. For each observation location, wind conditions (wind direction and wind speed before and after survey), coordinates and a photo were recorded.

Field odour surveys were performed on 20 February and 21 February 2020. The closest Bureau of Meteorology (BoM) weather station to the site is the Horsley Park AWS (automatic weather station), which is located approximately 4 km to the southwest of the WPRRF. Observations were focused around the WPRRF and a wind rose summarising the meteorological conditions in the area during the survey period (2pm 20 February – 2pm 21 February) is provided in Figure 3.1 from the Horsley Park AWS. Observations were noted at the start and the end of each odour survey by the observer using a handheld anemometer and these observations are provided in Table 3-3. The wind directions noted during these surveys differed to the directions recorded for the region at Horsley Park AWS. The differences are a result of terrain and building influences as well as the observed directions recorded at a height of 1.5 m compared to a 10 m AWS anemometer height.

The wind speed frequency as recorded at the Horsley Park AWS during the survey period are provided in Figure 3.2. The dominance of light winds provided a challenge in finding survey locations due to limited access throughout the surrounding industrial area.

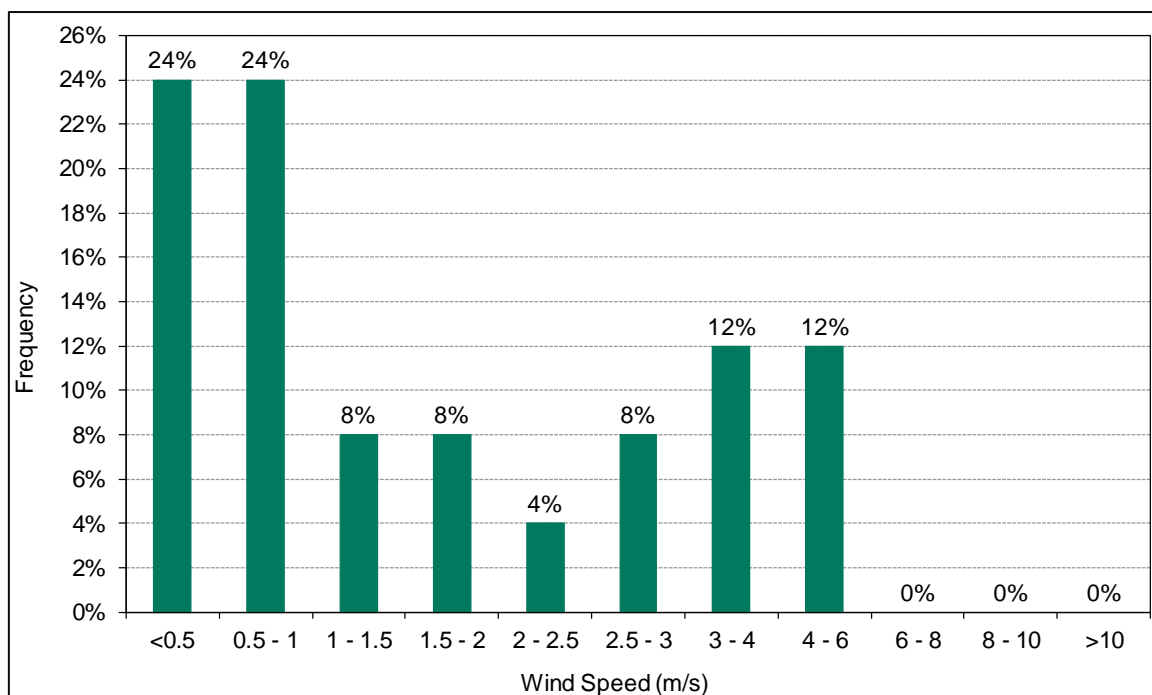




**Figure 3.1: Horsley Park AWS wind rose**

**Table 3-3: Observed meteorological data**

ID	Wind direction		Wind speed (m/s)	
	Start	End	Start	End
OS1	E	E	2.0	0.6
OS2	W	calm	1.3	calm
OS3	calm	NE	calm	0.7
OS4	NNE	WNW	1.3	0.9
OS5	W	WNW	0.9	0.8
OS6	calm	WNW	calm	1.1
OS7	calm	ENE	calm	1.3



**Figure 3.2: Horsley Park AWS wind speed frequency**

### 3.2.3 Survey Results

The field odour observation results are presented in Figure 3.3 and summarised in Table 3-4. Each survey is presented as a pie chart of the odour intensity and is plotted on an aerial image along with the wind direction/directions taken with a handheld anemometer at the time of the survey as a yellow arrow. As there is no history of complaints, the predicted odour impacts from the WPRRF odour assessment report (Pacific Environment, 2016) was used to assist in determining locations for stationary observations.

The survey period was dominated by calm winds that are traditionally associated with poor dispersion and therefore locations nearby to the entrance of the WPRRF were selected. Odour Survey 1 (OS1) was conducted on 20 February at approximately 8 pm on Davis Road near the entrance of the site as it was difficult to find access to roads downwind of the facility. No odour was observed at OS1 or at the end of Cowpasture Road near the entrance to Prospect Water Treatment Plant. No survey was conducted at the end of Cowpasture Road due to safety restrictions.

The remaining six odour surveys were conducted on 21 February. Light to calm winds again dominated the survey period so locations close to the entrance of the WPRRF were selected. Other than background odours (grass, hot chips and chemicals), a distinct waste odour was detected for a 20 second period during OS7. OS7 was conducted just after midday on Davis Road and was directly related to a truck passing the survey location. The truck was full of waste and had just left the site. The observer noted that the truck was appropriately covered and the smell, although distinctly waste, was only slightly unpleasant and lasted for a maximum of 20 seconds. A number of trucks were noted to pass the observer during the seven stationary odour surveys but this was the only instance that a waste odour was observed.

The survey results show that no odour was directly observed from the WPRRF at any of the seven stationary survey locations or during any additional observations noted during the monitoring period. The site inspection showed that odour from the receival hall was only present in the absolute vicinity of the receival hall.



**Figure 3.3: Field odour survey results**

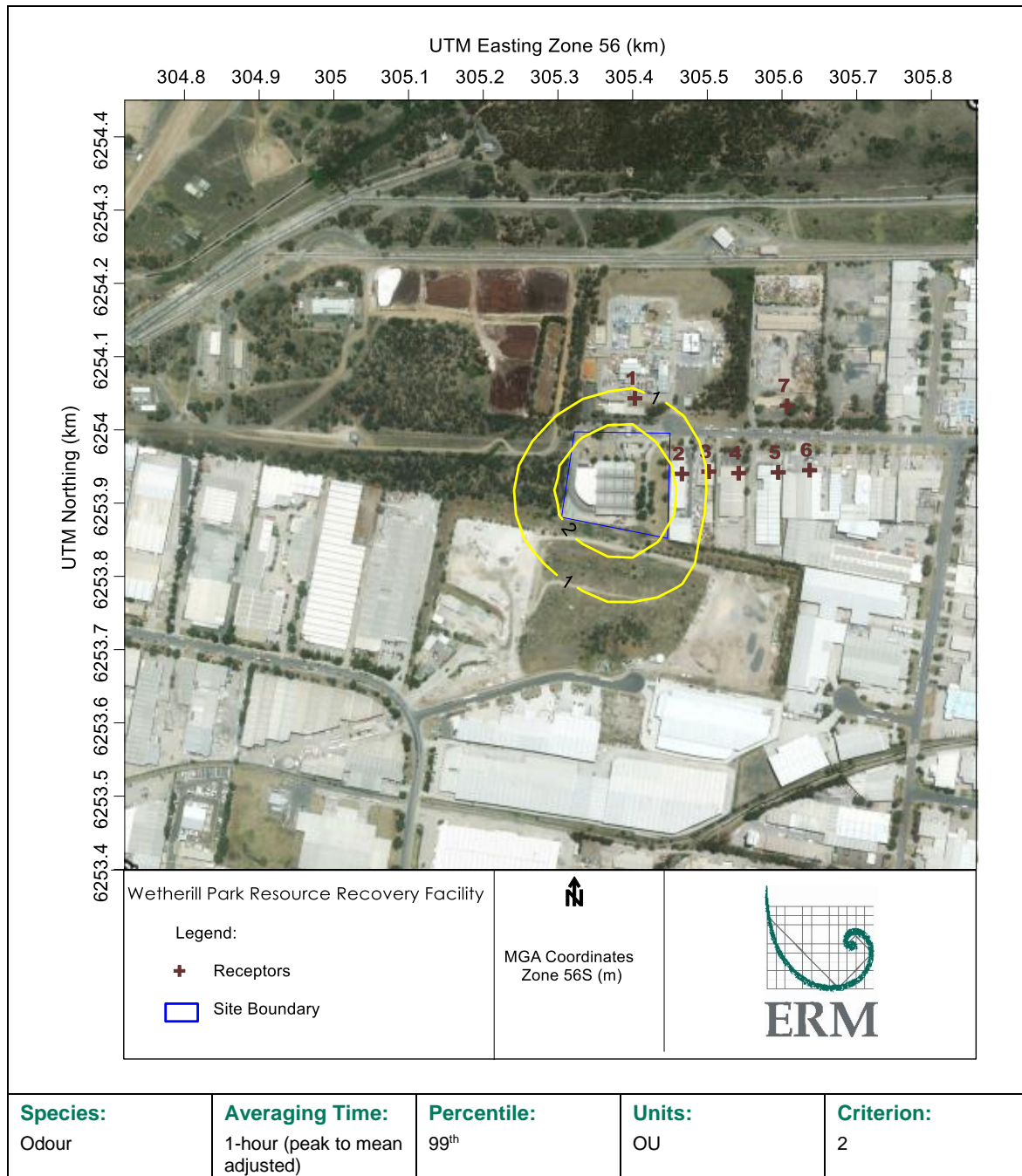
**Table 3-4: Summary of results**

ID	Number of intensity scale observations							Observed character
	0	1	2	3	4	5	6	
OS1	45	15	0	0	0	0	0	-
OS2	52	5	0	3	0	0	0	Grass
OS3	57	1	0	2	0	0	0	Hot chips
OS4	54	4	2	0	0	0	0	-
OS5	39	14	7	0	0	0	0	-
OS6	56	4	0	0	0	0	0	-
OS7	46	10	1	3	0	0	0	Waste, Chemicals

### 3.3 Comparison Summary

The field odour survey results were compared against the predicted odour impacts from the WPRRF odour assessment report (Pacific Environment, 2016) that was prepared as part of EIS for the upgrade of the facility. The modelling results for the proposed operations that were presented in the odour assessment report are provided in Figure 3.4. The emission inventory for the prediction was compiled from direct measurements of fresh mixed waste streams that were taken at landfills and recycling facilities in New South Wales and neighbouring states. The modelling results (yellow contour) indicated that the odour guideline will not be exceeded at the nearest commercial receptors. Residential properties are much further away and will not be impacted by the WPRRF.

Field surveys were conducted in available locations in the industrial area surrounding the WPRRF. The survey period was dominated by calm winds that are traditionally associated with poor dispersion and therefore an increase in the likelihood of odour impacts. No odour was observed directly from the WPRRF site during the survey period. A distinct waste odour was detected during OS7 as a full truck drove past the survey location after exiting the site. The waste odour was only detected for a 20 second period and was only considered slightly unpleasant by the assessor. The extent of impact from the site is considered consistent with the modelled prediction.



**Figure 3.4: Predicted odour impact (Pacific Environment, 2016)**




## 4. SITE ODOUR AUDIT AND ACTION PLAN

SUEZ has identified a number of potential odour sources at the WPRRF site operations. The potential odour sources are provided below:

- waste receival and storage area
- waste Pit
- vehicles entering/exiting the site
- leachate containment tank and stormwater pits

During the site visit on 20 February 2020, each of the potential odour sources were observed. Images of the potential odour sources that were taken during the site visit are provided in Table 4-1. No additional odour sources were identified during the site visit and the design of the facility and the controls applied were appropriate and in line with industry best practice for odour management.

**Table 4-1: Potential odour sources**

Waste receival and storage area	Waste pit	Vehicles entering/exiting	Leachate containment and stormwater pits
	N/A (access to waste pit restricted)		

In addition to the potential odour sources, the latest SUEZ WPRRF Odour Management Plan (OMP) (issued October 2019) was reviewed during the site visit to identify any gaps in information and to ensure that it is being applied appropriately. The review identified only the following small areas that require action:

- WPRRF Weekly Odour Monitoring Checklist (FORM026.4) needs to be uploaded to SUEZ Australia drive so that it can be downloaded and printed for weekly monitoring (currently located locally).
- Inspection of deodoriser chemical levels/amounts needs to be added to WPRRF Weekly Odour Monitoring Checklist.
- Include site specific odour management training within training schedule for supervisors (currently the SUEZ Australia Odour Management Standard Operating Procedure training is all that is conducted).
- Update contingency plan #2 and #3 – remove the storage of spare parts as these are not stored onsite but are available from supplier as required.
- Update contingency plan #8 – update to indicate that backup generator is not stored onsite for extended power outage but a current contract is in place for one to be brought to site when required.

- Update contingency plan #8 – include an operational control to ensure doors are closed during a power outage.

All mitigation and management measures other than those outline above were found to be appropriate and implemented effectively. It should be noted that the waste pit was not accessed directly due to safety concerns but the operation that was able to be observed was appropriate.

## 5. CONCLUSION

An odour audit was performed on 20 February and 21 February 2020 at the SUEZ WPRRF site as part of the consent provided by DPIE for the expansion of the operations at the facility. The odour audit has been conducted within six months of the commencement of the expanded operations at the facility. The facility has not received any odour complaints and field odour surveys conducted over both days indicated that the extent of impact from the site is considered consistent with the modelled prediction provided as part of the EIS.

The site visit reviewed the potential odour sources outlined within the current OMP and no additional sources were identified. The mitigation and management measures currently implemented at the WPRRF were reviewed against the current OMP and found to be mostly appropriate with minor updates. The suggested updates are included as part of an action plan in Section 4. Correspondence received on 14 April 2020 indicated that all suggested actions have been completed and the site is compliant (J Simmons 2020, pers. comm., 14 April).

## 6. REFERENCES

- DEHP. (2013). *Guideline: Odour Impact Assessment from Developments*. Brisbane: Department of Environment and Heritage Protection.
- NSWDPE. (10 December 2015). Secretary's Environmental Assessment Report Spring Farm MOD 5.
- Ormerod, R. J., & Grocott, S. C. (2002). Development and application of state-of-the science techniques for odour monitoring, modelling and assessment: a case from Queensland. Brisbane: Proceedings 4th Annual Conference of the Environmental Engineering Society.
- Ormerod, R. J., D'Abreton, P. C., & Grocott, S. C. (2002). Development of site-specific odour criteria and compliance assessments using odour intensity observations and modelling. Christchurch: Clean Air Society of Australia and New Zealand.
- Pacific Environment. (2016). *Wetherill Park Resource Recovery Facility Upgrade - Odour Assessment*. Sydney: ERM (previously Pacific Environment).
- Pitt, D. (2014). Field odour assessments for estimating odour concentrations. *Air Quality and Climate Change*, 48(1), 24-32.
- Standards Australia. (2001). *AS4323.3 Determination of Odour Concentration by Dynamic Olfactometry*. Sydney: Standards Australia.
- SUEZ. (August 2017). SUEZ Odour Management Plan - Spring Farm Recovery Park. *Version 1*.
- Verein Deutscher Ingenieure. (1993). *Determination of odorants in ambient air by field inspections intensity VDI3940*. Dusseldorf: Kommission Reinhaltung der Luft im VDI und DIN.

## APPENDIX A

### Field Odour Survey Sheets



## Field Odour Intensity Observation Log Sheet

Panelist Name: M. Lewis  
 Date: 20/02/2020  
 Start Time: 19:55  
 Site Code: OS1  
 Location: E 305542 N 6254011 56H

Wind Speed: 2 m/s  
 Cloud Cover: moderate  
 Precipitation: 0 mm  
 Start: 2 moderate  
 End: 0.6 moderate  
 0



0	1	2	3	4	5	6
Not Detectable	Very Weak	Weak	Distinct	Strong	Very Strong	Extremely Strong

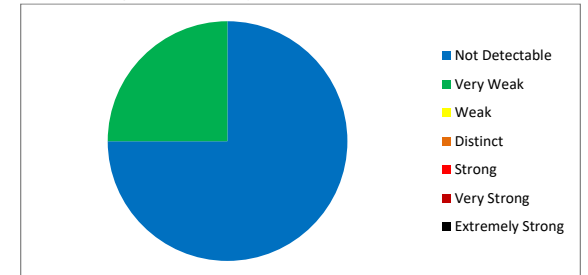
Perceived Odour Source:  
N/A

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

Photo:



Plot of percentages of odour intensity observations:



Colour coding of intensity observations:

0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	1	0
0	0	0	0	1
0	0	0	1	1
0	0	0	0	1
0	1	1	0	1
0	0	0	0	1
0	0	0	1	0
1	1	0	1	0

Panelist Name: M. Lewis  
 Date: 21/02/2020  
 Start Time: 8:45  
 Site Code: OS2  
 Location: E 303724 N 6254129 56H

Wind Speed: Start 1.3 End calm m/s  
 Cloud Cover: moderate-heavy moderate-heavy  
 Precipitation: 0 0 mm



0	1	2	3	4	5	6
Not Detectable	Very Weak	Weak	Distinct	Strong	Very Strong	Extremely Strong

Perceived Odour Source:  
 Grass (G)

Time	Intensity	Offensiveness	Source	Time	Intensity	Offensiveness	Source	Time	Intensity	Offensiveness	Source
0:10	0			3:30	0			6:50	1		
0:20	0			3:40	0			7:00	0		
0:30	0			3:50	0			7:10	0		
0:40	0			4:00	0			7:20	0		
0:50	0			4:10	0			7:30	0		
1:00	0			4:20	0			7:40	3	1	G
1:10	0			4:30	1			7:50	1		
1:20	0			4:40	0			8:00	0		
1:30	0			4:50	0			8:10	0		
1:40	0			5:00	0			8:20	0		
1:50	0			5:10	0			8:30	1		
2:00	0			5:20	0			8:40	0		
2:10	0			5:30	3	1	G	8:50	0		
2:20	0			5:40	1			9:00	0		
2:30	0			5:50	0			9:10	0		
2:40	0			6:00	0			9:20	0		
2:50	0			6:10	0			9:30	0		
3:00	0			6:20	0			9:40	0		
3:10	0			6:30	0			9:50	0		
3:20	0			6:40	3	1	G	10:00	0		

Photo:



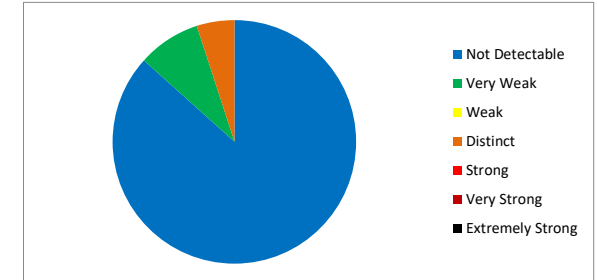
Colour coding of intensity observations:

0	0	0	0	0
0	0	0	0	0
0	0	1	0	1
0	0	0	3	0
0	0	0	1	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	3	0	0
0	0	1	3	0
0	0	0	1	0
0	0	0	0	0

Summary odour intensity observations:

Intensity	No obs	%	Descriptor
0	52	87%	Not Detectable
1	5	8%	Very Weak
2	0	0%	Weak
3	3	5%	Distinct
4	0	0%	Strong
5	0	0%	Very Strong
6	0	0%	Extremely Strong
	60	100%	

Plot of percentages of odour intensity observations:



Panelist Name: M. Lewis  
 Date: 21/02/2020  
 Start Time: 9:16  
 Site Code: OS3  
 Location: E 305941 N 6253999 56H

Wind Speed: Start 1.3 End calm m/s  
 Cloud Cover: moderate-heavy moderate-heavy mm  
 Precipitation: 0 0



Photo: N/A

0	1	2	3	4	5	6
Not Detectable	Very Weak	Weak	Distinct	Strong	Very Strong	Extremely Strong

Perceived Odour Source:  
 Hot chips (Ch)

Time	Intensity	Offensiveness	Source	Time	Intensity	Offensiveness	Source	Time	Intensity	Offensiveness	Source
0:10	0			3:30	0			6:50	3	1	Ch
0:20	0			3:40	0			7:00	3	1	Ch
0:30	0			3:50	0			7:10	1		
0:40	0			4:00	0			7:20	0		
0:50	0			4:10	0			7:30	0		
1:00	0			4:20	0			7:40	0		
1:10	0			4:30	0			7:50	0		
1:20	0			4:40	0			8:00	0		
1:30	0			4:50	0			8:10	0		
1:40	0			5:00	0			8:20	0		
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3:00	0			6:20	0			9:40	0		
3:10	0			6:30	0			9:50	0		
3:20	0			6:40	0			10:00	0		

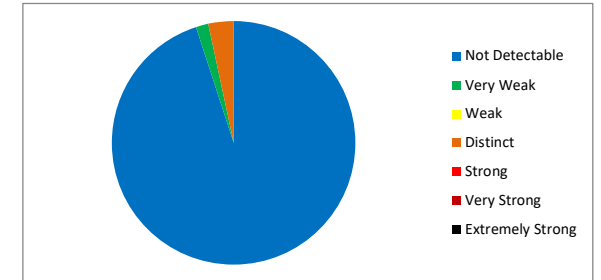
Colour coding of intensity observations:

0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	3	0
0	0	0	3	0
0	0	0	1	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

Summary odour intensity observations:

Intensity	No obs	%	Descriptor
0	57	95%	Not Detectable
1	1	2%	Very Weak
2	0	0%	Weak
3	2	3%	Distinct
4	0	0%	Strong
5	0	0%	Very Strong
6	0	0%	Extremely Strong
60		100%	

Plot of percentages of odour intensity observations:



Panelist Name: M. Lewis  
 Date: 21/02/2020  
 Start Time: 9:47  
 Site Code: OS4  
 Location: E 305692 N 6253984 56H

Wind Speed: Start 1.3 End 0.9 m/s  
 Cloud Cover: moderate-heavy light-moderate  
 Precipitation: 0 0 mm



Intensity Scale:

0	1	2	3	4	5	6
Not Detectable	Very Weak	Weak	Distinct	Strong	Very Strong	Extremely Strong

Perceived Odour Source:  
N/A

Photo:



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

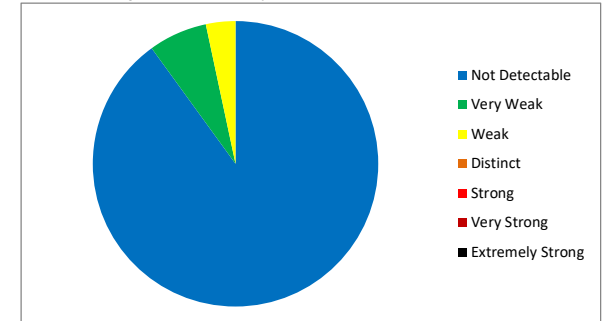
Colour coding of intensity observations:

0	2	0	1	0
0	2	0	0	0
0	0	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	1	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	0

Summary odour intensity observations:

Intensity	No obs	%	Descriptor
0	54	90%	Not Detectable
1	4	7%	Very Weak
2	2	3%	Weak
3	0	0%	Distinct
4	0	0%	Strong
5	0	0%	Very Strong
6	0	0%	Extremely Strong
	60	100%	

Plot of percentages of odour intensity observations:



Panelist Name: M. Lewis  
 Date: 21/02/2020  
 Start Time: 10:02  
 Site Code: OS5  
 Location: E 305542 N 6253988 56H

Wind Speed: Start 0.9 End 0.8 m/s  
 Cloud Cover: light-moderate light-moderate  
 Precipitation: 0 0 mm



0	1	2	3	4	5	6
Not Detectable	Very Weak	Weak	Distinct	Strong	Very Strong	Extremely Strong

Perceived Odour Source:  
N/A

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

Photo:



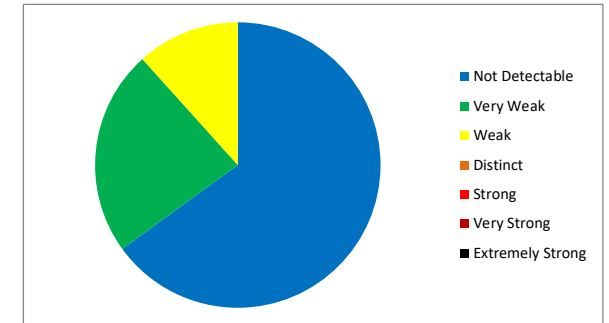
Colour coding of intensity observations:

0	0	0	0	0
0	0	1	0	0
0	0	2	1	1
0	0	0	0	0
0	0	0	0	1
0	0	0	1	1
1	0	0	0	1
1	0	0	1	2
2	0	0	0	2
1	0	0	0	2
2	1	0	0	2
0	0	1	0	1

Summary odour intensity observations:

Intensity	No obs	%	Descriptor
0	39	65%	Not Detectable
1	14	23%	Very Weak
2	7	12%	Weak
3	0	0%	Distinct
4	0	0%	Strong
5	0	0%	Very Strong
6	0	0%	Extremely Strong
	60	100%	

Plot of percentages of odour intensity observations:



Panelist Name: M. Lewis  
 Date: 21/02/2020  
 Start Time: 10:41  
 Site Code: OS6  
 Location: E 305176 S 6253640 56H

Wind Speed: Start calm End 1.1 m/s  
 Cloud Cover: light-moderate moderate 0  
 Precipitation: 0 mm



0	1	2	3	4	5	6
Not Detectable	Very Weak	Weak	Distinct	Strong	Very Strong	Extremely Strong

Perceived Odour Source:  
N/A

Photo:



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

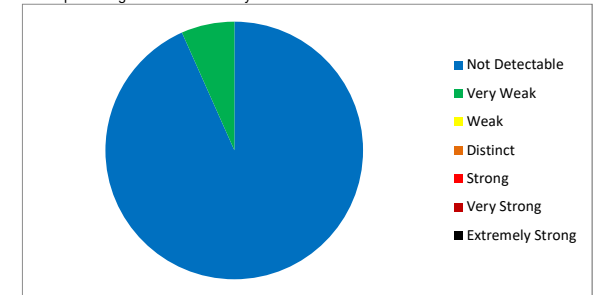
Colour coding of intensity observations:

0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	1	0	0
0	0	1	0	0
0	0	0	1	0
0	0	0	0	0
1	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

Summary odour intensity observations:

Intensity	No obs	%	Descriptor
0	56	93%	Not Detectable
1	4	7%	Very Weak
2	0	0%	Weak
3	0	0%	Distinct
4	0	0%	Strong
5	0	0%	Very Strong
6	0	0%	Extremely Strong
	60	100%	

Plot of percentages of odour intensity observations:



Panelist Name: M. Lewis  
 Date: 21/02/2020  
 Start Time: 12:19  
 Site Code: OS7

Location: E 305585 N 6253990 56H

Intensity Scale:

0	1	2	3	4	5	6
Not Detectable	Very Weak	Weak	Distinct	Strong	Very Strong	Extremely Strong

Perceived Odour Source:  
 W- waste, C- chemicals

Time	Intensity	Offensiveness	Source	Time	Intensity	Offensiveness	Source	Time	Intensity	Offensiveness	Source
0:10	0			3:30	0			6:50	3		
0:20	0			3:40	0			7:00	0	2	C
0:30	1			3:50	0			7:10	0		
0:40	1			4:00	0			7:20	1		
0:50	0			4:10	0			7:30	1		
1:00	0			4:20	1			7:40	0		
1:10	0			4:30	3	2	W	7:50	0		
1:20	0			4:40	3	2	W	8:00	0		
1:30	0			4:50	0			8:10	0		
1:40	0			5:00	0			8:20	0		
1:50	0			5:10	0			8:30	0		
2:00	0			5:20	0			8:40	0		
2:10	0			5:30	0			8:50	0		
2:20	0			5:40	0			9:00	0		
2:30	0			5:50	0			9:10	0		
2:40	0			6:00	1			9:20	0		
2:50	0			6:10	1			9:30	1		
3:00	0			6:20	0			9:40	0		
3:10	2			6:30	0			9:50	0		
3:20	1			6:40	1			10:00	0		

Colour coding of intensity observations:

0	0	0	1	0
0	0	1	0	0
1	0	3	0	0
1	0	3	1	0
0	0	0	3	0
0	0	0	0	0
0	2	0	0	0
0	1	0	1	0
0	0	0	1	1
0	0	0	0	0
0	0	0	0	0
0	0	1	0	0

Summary odour intensity observations:

Intensity	No obs	%	Descriptor
0	46	77%	Not Detectable
1	10	17%	Very Weak
2	1	2%	Weak
3	3	5%	Distinct
4	0	0%	Strong
5	0	0%	Very Strong
6	0	0%	Extremely Strong
60		100%	

Wind Speed: Start calm End 1.1 m/s  
 Cloud Cover: ght-moderat 1.1 moderate  
 Precipitation: 0 0 mm

Photo: N/A



Plot of percentages of odour intensity observations:

