



JBS41278-50806

18 June 2012

ATT: Paul Robilliard Precinct Project Manager Strategies & Land Release Department of Planning & Infrastructure (sent via email: <u>paul.robilliard@planning.nsw.gov.au</u>)

Addendum to JBS (July 2011) 'Odour Assessment, Austral and Leppington North Precinct'

Dear Mr Robilliard,

1. Introduction and Background

JBS Environmental Pty Ltd (JBS) was engaged by the NSW Department of Planning and Infrastructure (the Department) to prepare this addendum to '*Odour Assessment, Austral and Leppington North Precinct*', JBS Environmental Pty Ltd dated July 2011 (JBS 2011), which was completed for the proposed Sydney Growth Centre release identified as the Austral and Leppington North Precincts (the site). The boundaries of the site are shown on **Figure 1 (Attachment 2**).

Subsequent to public exhibition of JBS (2011), along with the Austral and Leppington Draft Precinct Plan in late 2011, and receipt of submissions from the public and other relevant stakeholders, JBS was requested to revise the odour modelling presented in JBS (2011) in response to the following comments:

- Confirmation of whether process to identify odour sources was a desktop review of aerials, site inspection or both; and
- Consideration of potential odour sources within a 500m radius of the site boundaries.

At the request of the Department, the additional works have not been issued as a revised version of the JBS (2011) report, rather this addendum has been prepared to address the comments above. This Addendum when read in conjunction with (JBS 2011) provides an assessment of potential odour impacts on the site including those potential odours sources located within 500m of the site boundaries.

2. Method of Odour Source Identification

As part of JBS (2011), permission to enter operation poultry operations was grant for only a handful of premises. Noting that most poultry farm operators are vigilant in preventing the transmission from other premises onto their sheds, this limited access to properties was not unexpected.

Identification of potential odour sources in JBS (2011), and this addendum, was therefore a combination of desktop aerial review and viewing of the premises from the street. All reasonable efforts were made during the street inspection to ascertain whether each source property was operational or disused. However, noting the preliminary nature of the assessment reported in JBS (2011) and this Addendum, any property where site observations were inconclusive as to its operational status, were included as a potential source in the odour modelling.

3. Revision of Odour Modelling to Include External Sources

The revised odour modelling was conducted in accordance with the methods presented in JBS (2011).

3.1. Identification of Poultry Farms External to Site Boundaries

JBS has assessed all poultry farms identified within a 500m radius, as nominated by the Department. The 500m distance is also considered to be consistent with the majority of published recommended minimum separation distances of poultry sheds to a range of adjoining land-uses, including urban residential areas, as summarised in JBS (2011).

The poultry farms identified within a 500m radius of the site boundaries are summarised in **Table 1** following and shown on **Figure 2** (Attachment 2).

Address	Operation Type	Shed I D	Easting	Northing	Shed Dimensions (m)
		1	298407	6239431	15 x 50
1342 Camden Valley Way,		2	298433	6239416	15 x 50
Leppington	Broiler (meat)	3	298459	6239404	15 x 50
		4	298484	6239390	20 x 50
1431 Camden Valley Way, Leppington	Broiler (meat)	1	298062	6239349	15 x 45
		1	296502	6239859	15 x 130
48 Dickson Road Leppington	Broiler (meat)	2	296518	6239881	15 x 130
11 3	Broner (meat)	3	296533	6239899	15 x 130
		1	299510	6244911	5 x 55
		2	299520	6244914	5 x 55
215 Flynn Avenue, West		3	299529	6244914	5 x 55
Hoxton	Broiler (meat)	4	299538	6244913	5 x 55
		5	299547	6244893	5 x 55
		6	299532	6244881	5 x 50
		1	295740	6245746	20 x 135
280 Gurner Avenue, Kemps	Broiler (meat)	2	295758	6245761	15 x 135
Сгеек		3	295783	6245766	15 x 135
		1	295966	6245055	15 x 60
705 Fifteenth Avenue,	Broiler (meat)	2	295975	6245027	15 x 60
Kemps Creek	Di olioi (illout)	3	295724	6244882	13 x 60
		1	295726	6244907	13 x 60
700 fifteenth Avenue,	Broiler (meat)	2	295728	6244936	13 x 60
Rossmore	Broner (meat)	3	295970	6244817	13 x 60
		1	295972	6244841	13 x 60
670 Fifteenth Avenue.		2	295978	6244864	13 x 60
Kemps Creek	Broiler (meat)	3	295983	6244892	13 x 60
		4	295338	6244262	15 x 60
505 Twelfth Avenue,		1	295342	6244289	15 x 60
Rossmore	Broiler (meat)	2	295000	6242692	15 x 90
		1	295023	6242686	15 x 90
2 Wynyard Avenue,		2	295047	6242685	15 x 90
Rossmore	Broiler (meat)	3	295072	6242687	15 x 110
		4	298407	6239431	15 x 50
		1	298433	6239416	15 x 50
1342 Camden Valley Wav.		2	298459	6239404	15 x 50
Leppington	Broiler (meat)	3	298484	6239390	20 x 50
		4	298062	6239349	15 x 45

Table 1: Summary	of Poultry	Farms in	Proximity	of the S	ite
Table L. Summar	y of Found y	i arms m	FIUNITIE	or the J	ne

3.2. Dispersion Modelling

Dispersion modelling was revised for the site to include all the external sources listed in **Table 1** to the sources listed in JBS (2011). Dispersion modelling was conducted as per the methods present in JBS (2011). Briefly inputs and options used in the modelling are summarised as follows:

- An odour emission rate was derived from the ventilation rate for each shed and an odour level of 324 OU/m³. In estimating a ventilation rate it has been assumed that the poultry sheds are an average height of 4 m. A maximum daily ventilation rate has been estimated at 18 volume changes per hour;
- For the purposes of modelling, for temperature 15°C and lower, the emissions from poultry sheds were set as 10% of daytime emissions. On this basis, a temperature dependent variable emission rate file was prepared.
- Two years of meteorological data from the Bringelly weather station was adopted for the site; and
- All poultry sheds were assumed to be naturally ventilated based on no venting infrastructure being observed during street side inspection of the source sites.

Justification for the use of these values is provided in JBS (2011).

4. Dispersion Model Results

The AUSPLUME model outputs are provided in **Attachment 2**, and are summarised in **Figures 3** and **4** (**Attachment 2**) which show the frequency of selected odour criteria being exceeded across the area of the site. Discussion of relevant assessment criteria is provided in JBS (2011).

Review of **Figure 5** (**Attachment 2**) indicates that when compared to the 2 OU criteria (i.e. for urban land use), revised modelled odour emissions from the existing poultry farm operations within the boundaries of

the Precinct and within 500m of the Precinct, exceed the 2 OU value at a 99th percentile over the entire precinct.

Review of **Figure 6** (Attachment 2) indicates that when compared to the 7 OU criteria (i.e. for rural use), revised modelled odour emissions from the existing poultry farm operations within the boundaries of the Precinct and within 500m of the Precinct, exceed the 7 OU value at a 99th percentile over approximately 50% of the precinct.

As with the original assessment JBS (2011) the revised results also suggest that the southern portion of the site is more suitable for immediate residential development than the northern end.

5. Discussion of Results

The original odour assessment modelling detailed in JBS (2011), considering only potential odour sources located within the boundaries of the site, indicated that when compared to the 2 OU 99% compliance criteria (i.e. the lowest criteria endorsed by the NSW DECCW, based on high density urban land use), approximately 90% of the precinct area is unacceptably impacted.

The revised modelling reported herein, completed to include potential odour sources located within 500m of the Precinct boundaries, has indicated that the entire Precinct area is affected by potentially unacceptable odours.

As such the conclusions and discussion provided in JBS (2011) are still considered valid, and are summarised as follows.

Notwithstanding the conservatism applied in the dispersion modelling, the results suggest that potential existing odour levels from poultry operations will be required to be considered in the development of the precinct. It should be noted that new residents whom move to area are unlikely to share the existing tolerance of poultry odours that presumably currently occurs in the area.

The greatest odour impacts were predicted along the length of the western side of the precinct consequent of higher density of poultry sheds located within and external to the Precinct boundaries.

However in viewing the current plans, it is acknowledged that the land in the Precincts will be rezoned to allow the planned development to proceed on this area of predominantly 'rural/small holdings'. Under such a rezoning it is likely that the current odour sources would be progressively developed over time for urban use, and would therefore not need to be considered as permanent limiting factors for the development of the Precincts. Such a scenario however would require a mechanism for notification, or controls on development in the zoning transition period, to ensure future purchasers were made aware of the potential for odour impacts. JBS understands that recent Sydney Growth Centre Projects have encountered similar situations where modelled odour footprints associated with pre-existing sources span large sections of the development area. In these situations the Development Control Plans (DCPs) were used successfully to identify areas potentially impacted by odours over the transition period. Subject to completion of further detailed assessments to further define the extent of odour impacts as described below, a similar approach may be suitable for the Austral and Leppington North Precincts.

Alternately a range of controls may be applied at both the operational and management level to mitigate odour impacts during in the rezoning transition period. This may comprise:

- Upgrading existing poultry sheds from natural ventilation to being tunnel ventilated with either treatment of the emissions prior to discharge or release through a stack;
- Use of vegetation buffer walls between poultry sheds and residential dwellings; or
- Investigation of acceptable separation distances by undertaking detailed dispersion modelling around each odour source site.

In viewing the results it should also be noted that the current assessment is considered a Level 1 Impact Assessment in accordance with NSW DEC (2005), which requires the use of worst-case input data. The results are substantially based on the predicted rates of odour emissions which have been measured at other sites. These measured rates of odour emissions were typically measured as worse case conditions on the other sites and are considered to be extremely conservative.

Notwithstanding the selection of the appropriate controls or DCP mechanisms, it is recommended that detailed odour assessment of the poultry sheds is completed. The modelling presented in the current study has assumed worst case conditions consistently occur across the entire precinct, whilst in reality the factors described in **Section 3.2** (e.g. temperature and ventilation rates) can vary significantly. The detailed assessment could primarily focus on site specific odour measurements on a representative number of poultry sheds with a view to characterising changes in the odour emission rates over time, as follows:

- Routine odour (or ammonia) concentrations measured both inside and outside the selected sheds to profile the impact of changes in atmospheric dispersion conditions over the course of each day;
- Routine odour (or ammonia) concentrations measured both inside and outside the selected sheds over the course of a breeding cycle to profile the impact of the batch age;
- A staged trial involving odour and/or ammonia measurements inside and outside the selected sheds while the size of side wall openings are varied to profile the impact of changes in ventilation rate; and
- Inclusion of odour sources external to the precinct boundaries.

The site specific data collected would be used to modify the odour emission rate inputs such that the dispersion modelling would be reflective of normal site conditions. The results would allow for more appropriate separation distances to be determined for the precinct. These detailed assessments would be undertaken on a local scale with other detailed land capability studies as would be anticipated with the proposed redevelopment of the precinct.

Prepared by:

Reviewed/Approved by:

Sumi Dorairaj Environmental Consultant JBS Environmental Pty Ltd Matthew Parkinson Principal JBS Environmental Pty Ltd

Attachments:

(1) Limitations
 (2) Figures
 (3) AUSPLUME Model Outputs

Attachment 1 – Limitations

This report has been prepared for use by the client who commissioned the works in accordance with the project brief only and has been based in part on information obtained from other parties. The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

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This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS Environmental Pty Ltd reserves the right to review the report in the context of the additional information

Attachment 2 – Figures









Figure 3: Poultry Shed Locations



Client: Department of Planning

Job No: 41278



	Poultry Shed Locations				
	Poultry Shed Locations 500m Radius				
	Investigation Areas				
	Precinct Boundary				
	Major Roads	0	0.25	0.5	1 Kilometer
	Cadastre				



Project: Austral and Leppington North Land Capability Assessment

Client: Department of Planning

Job No: 41278







Total Dir Freq 9% 15% 15% 19% 20% 7% 4% 10%

Figure 5 Seasonal Wind Roses Bringelly Air Monitoring Station 2007-2008

Department of Lands (2010) Note- All locations shown are approximate only









Cadastre

Contour of Criteria Exceedences (2 OU)



Figure 6: Frequency of Odour Unit (2OU) Criteria Exceedences

Project: Austral and Leppington North Land Capability Assessment

Client: Department of Planning



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Contour of Criteria Exceedencea (7 OU)





Project: Austral and Leppington North Land Capability Assessment

Client: Department of Planning

Attachment 3 – AUSPLUME Model Outputs

41278 Odour Source 1 to 26 - Naturally Ventilated Sheds

Concentration or deposition	Concentration
Emission rate units	OUV/second
Concentration units	Odour_Units
Units conversion factor	1.00E+00
Constant background concentration	0.00E+00
Terrain effects	Egan method
Smooth stability class changes?	No
Other stability class adjustments ("urba	an modes") None
Ignore building wake effects?	No
Decay coefficient (unless overridden by	/ met. file) 0.000
Anemometer height	10 m
Roughness height at the wind vane site	e 0.300 m
Averaging time for sigma-theta values	60 min.

DISPERSION CURVES Horizontal dispersion curves for sources <100m high Sigma-theta Vertical dispersion curves for sources <100m high Pasquill-Gifford Horizontal dispersion curves for sources >100m high Briggs Rural Vertical dispersion curves for sources >100m high Briggs Rural Enhance horizontal plume spreads for buoyancy? Yes Enhance vertical plume spreads for buoyancy? Yes Adjust horizontal P-G formulae for roughness height? Yes Roughness height 0.400m Adjustment for wind directional shear None

 PLUME RISE OPTIONS

 Gradual plume rise?
 Yes

 Stack-tip downwash included?
 Yes

 Building downwash algorithm:
 PRIME method.

 Entrainment coeff. for neutral & stable lapse rates 0.60,0.60
 Partial penetration of elevated inversions?

 No
 Disregard temp. gradients in the hourly met. file?
 No

and in the absence of boundary-layer potential temperature gradients given by the hourly met. file, a value from the following table (in K/m) is used:

Wind Spe	eed	5	Stability	Class			
Categor	y A	В	С	D E	F		
1	0.000	0.000	0.000	0.000	0.020	0.035	
2	0.000	0.000	0.000	0.000	0.020	0.035	
3	0.000	0.000	0.000	0.000	0.020	0.035	
4	0.000	0.000	0.000	0.000	0.020	0.035	
5	0.000	0.000	0.000	0.000	0.020	0.035	
6	0.000	0.000	0.000	0.000	0.020	0.035	

WIND SPEED CATEGORIES Boundaries between categories (in m/s) are: 1.54, 3.09, 5.14, 8.23, 10.80

WIND PROFILE EXPONENTS: "Irwin Urban" values (unless overridden by met. file)

AVERAGING TIMES 1 hour

1

41278 Odour Source 1 to 26 - Naturally Ventilated Sheds

SOURCE CHARACTERISTICS

VOLUME SOURCE: NS1SA

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 297800 6245326 77m 1m 31m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.22E+03
 5C 1.22E+03
 10C 1.22E+03
 15C 1.22E+03

 20C 1.22E+04
 25C 1.22E+04
 30C 1.22E+04
 35C 1.22E+04

 40C 1.22E+04
 45C 1.22E+04
 50C 1.22E+04

VOLUME SOURCE: NS1SB

X(m)Y(m)Ground ElevationHeightHor. spreadVert. spread297821624530277m1m29m1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.12E+03
 5C 1.12E+03
 10C 1.12E+03
 15C 1.12E+03

 20C 1.12E+04
 25C 1.12E+04
 30C 1.12E+04
 35C 1.12E+04

 40C 1.12E+04
 45C 1.12E+04
 50C 1.12E+04

No gravitational settling or scavenging.

VOLUME SOURCE: NS1SC

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 297855 6245282 77m 1m 19m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 7.29E+02
 5C 7.29E+02
 10C 7.29E+02
 15C 7.29E+02

 20C 7.29E+03
 25C 7.29E+03
 30C 7.29E+03
 35C 7.29E+03

 40C 7.29E+03
 45C 7.29E+03
 50C 7.29E+03
 50C 7.29E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS1SD

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 297772 6245151 77m 1m 23m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 8.75E+02
 5C 8.75E+02
 10C 8.75E+02
 15C 8.75E+02

 20C 8.75E+03
 25C 8.75E+03
 30C 8.75E+03
 35C 8.75E+03

 40C 8.75E+03
 45C 8.75E+03
 50C 8.75E+03
 35C 8.75E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS1SE

X(m)Y(m)Ground ElevationHeightHor. spreadVert. spread297815624516677m1m29m1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.12E+03
 5C 1.12E+03
 10C 1.12E+03
 15C 1.12E+03

 20C 1.12E+04
 25C 1.12E+04
 30C 1.12E+04
 35C 1.12E+04

 40C 1.12E+04
 45C 1.12E+04
 50C 1.12E+04

No gravitational settling or scavenging.

VOLUME SOURCE: NS1SF

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 297849 6245201 77m 1m 29m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.12E+03
 5C 1.12E+03
 10C 1.12E+03
 15C 1.12E+03

 20C 1.12E+04
 25C 1.12E+04
 30C 1.12E+04
 35C 1.12E+04

 40C 1.12E+04
 45C 1.12E+04
 50C 1.12E+04

No gravitational settling or scavenging.

VOLUME SOURCE: NS2SA

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 297025 6245017 68m 1m 29m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

VOLUME SOURCE: NS2SB

X(m)Y(m)Ground ElevationHeightHor. spreadVert. spread297052624499868m1m19m1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 7.29E+02
 5C 7.29E+02
 10C 7.29E+02
 15C 7.29E+02

 20C 7.29E+03
 25C 7.29E+03
 30C 7.29E+03
 35C 7.29E+03

 40C 7.29E+03
 45C 7.29E+03
 50C 7.29E+03
 50C 7.29E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS2SC

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 297083 6244996 68m 1m 19m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 7.29E+02
 5C 7.29E+02
 10C 7.29E+02
 15C 7.29E+02

 20C 7.29E+03
 25C 7.29E+03
 30C 7.29E+03
 35C 7.29E+03

 40C 7.29E+03
 45C 7.29E+03
 50C 7.29E+03
 50C 7.29E+03

No gravitational settling or scavenging.

VOLUME SOURCE: N32SA

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296501 6244194 83m 1m 25m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 9.72E+02
 5C 9.72E+02
 10C 9.72E+02
 15C 9.72E+02

 20C 9.72E+03
 25C 9.72E+03
 30C 9.72E+03
 35C 9.72E+03

 40C 9.72E+03
 45C 9.72E+03
 50C 9.72E+03
 50C 9.72E+03

No gravitational settling or scavenging.

VOLUME SOURCE: N32SB

X(m)Y(m)Ground ElevationHeightHor. spreadVert. spread296500624417083m1m25m1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 9.72E+02
 5C 9.72E+02
 10C 9.72E+02
 15C 9.72E+02

 20C 9.72E+03
 25C 9.72E+03
 30C 9.72E+03
 35C 9.72E+03

 40C 9.72E+03
 45C 9.72E+03
 50C 9.72E+03
 50C 9.72E+03

No gravitational settling or scavenging.

VOLUME SOURCE: N32SC

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296496 6244146 83m 1m 25m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 9.72E+02
 5C 9.72E+02
 10C 9.72E+02
 15C 9.72E+02

 20C 9.72E+03
 25C 9.72E+03
 30C 9.72E+03
 35C 9.72E+03

 40C 9.72E+03
 45C 9.72E+03
 50C 9.72E+03
 50C 9.72E+03

No gravitational settling or scavenging.

VOLUME SOURCE: N32SD

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296489 6244121 83m 1m 25m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

VOLUME SOURCE: N32SE

X(m)Y(m)Ground ElevationHeightHor. spreadVert. spread296485624409183m1m25m1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 9.72E+02
 5C 9.72E+02
 10C 9.72E+02
 15C 9.72E+02

 20C 9.72E+03
 25C 9.72E+03
 30C 9.72E+03
 35C 9.72E+03

 40C 9.72E+03
 45C 9.72E+03
 50C 9.72E+03
 50C 9.72E+03

No gravitational settling or scavenging.

VOLUME SOURCE: N32SF

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296484 6244063 83m 1m 25m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 9.72E+02
 5C 9.72E+02
 10C 9.72E+02
 15C 9.72E+02

 20C 9.72E+03
 25C 9.72E+03
 30C 9.72E+03
 35C 9.72E+03

 40C 9.72E+03
 45C 9.72E+03
 50C 9.72E+03
 50C 9.72E+03

No gravitational settling or scavenging.

VOLUME SOURCE: N42SA

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 297221 6244213 65m 1m 25m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 9.72E+02
 5C 9.72E+02
 10C 9.72E+02
 15C 9.72E+02

 20C 9.72E+03
 25C 9.72E+03
 30C 9.72E+03
 35C 9.72E+03

 40C 9.72E+03
 45C 9.72E+03
 50C 9.72E+03
 50C 9.72E+03

No gravitational settling or scavenging.

VOLUME SOURCE: N42SB

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 297226 6 65m 1m 25m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 9.72E+02
 5C 9.72E+02
 10C 9.72E+02
 15C 9.72E+02

 20C 9.72E+03
 25C 9.72E+03
 30C 9.72E+03
 35C 9.72E+03

 40C 9.72E+03
 45C 9.72E+03
 50C 9.72E+03
 50C 9.72E+03

No gravitational settling or scavenging.

VOLUME SOURCE: N42SC

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 297233 6244262 65m 1m 25m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 9.72E+02
 5C 9.72E+02
 10C 9.72E+02
 15C 9.72E+02

 20C 9.72E+03
 25C 9.72E+03
 30C 9.72E+03
 35C 9.72E+03

 40C 9.72E+03
 45C 9.72E+03
 50C 9.72E+03
 50C 9.72E+03

No gravitational settling or scavenging.

VOLUME SOURCE: N42SD

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 297229 6244286 65m 1m 25m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

VOLUME SOURCE: N52SA

X(m)Y(m)Ground ElevationHeightHor. spreadVert. spread298386624377190m1m10m1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 5.20E+02
 5C 5.20E+02
 10C 5.20E+02
 15C 5.20E+02

 20C 5.20E+03
 25C 5.20E+03
 30C 5.20E+03
 35C 5.20E+03

 40C 5.20E+03
 45C 5.20E+03
 50C 5.20E+03
 50C 5.20E+03

No gravitational settling or scavenging.

VOLUME SOURCE: N52SB

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 298391 6243809 90m 1m 9m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 4.50E+02
 5C 4.50E+02
 10C 4.50E+02
 15C 4.50E+02

 20C 4.50E+03
 25C 4.50E+03
 30C 4.50E+03
 35C 4.50E+03

 40C 4.50E+03
 45C 4.50E+03
 50C 4.50E+03
 35C 4.50E+03

No gravitational settling or scavenging.

VOLUME SOURCE: N52SC

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 298435 6243815 90m 1m 9m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 7.78E+02
 5C 7.78E+02
 10C 7.78E+02
 15C 7.78E+02

 20C 7.78E+03
 25C 7.78E+03
 30C 7.78E+03
 35C 7.78E+03

 40C 7.78E+03
 45C 7.78E+03
 50C 7.78E+03
 50C 7.78E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS6SA

X(m)Y(m)Ground ElevationHeightHor. spreadVert. spread296944624364264m1m31m1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.22E+03
 5C 1.22E+03
 10C 1.22E+03
 15C 1.22E+03

 20C 1.22E+04
 25C 1.22E+04
 30C 1.22E+04
 35C 1.22E+04

 40C 1.22E+04
 45C 1.22E+04
 50C 1.22E+04

No gravitational settling or scavenging.

VOLUME SOURCE: NS6SB

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296971 6243456 64m 1m 31m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.22E+03
 5C 1.22E+03
 10C 1.22E+03
 15C 1.22E+03

 20C 1.22E+04
 25C 1.22E+04
 30C 1.22E+04
 35C 1.22E+04

 40C 1.22E+04
 45C 1.22E+04
 50C 1.22E+04

No gravitational settling or scavenging.

VOLUME SOURCE: NS6SC

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296998 6243451 64m 1m 31m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.22E+03
 5C 1.22E+03
 10C 1.22E+03
 15C 1.22E+03

 20C 1.22E+04
 25C 1.22E+04
 30C 1.22E+04
 35C 1.22E+04

 40C 1.22E+04
 45C 1.22E+04
 50C 1.22E+04

VOLUME SOURCE: NS6SD

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 297024 6243445 64m 1m 31m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.22E+03
 5C 1.22E+03
 10C 1.22E+03
 15C 1.22E+03

 20C 1.22E+04
 25C 1.22E+04
 30C 1.22E+04
 35C 1.22E+04

 40C 1.22E+04
 45C 1.22E+04
 50C 1.22E+04

No gravitational settling or scavenging.

VOLUME SOURCE: NS7SA

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296287 6243057 68m 1m 11m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 8.75E+02
 5C 8.75E+02
 10C 8.75E+02
 15C 8.75E+02

 20C 8.75E+03
 25C 8.75E+03
 30C 8.75E+03
 35C 8.75E+03

 40C 8.75E+03
 45C 8.75E+03
 50C 8.75E+03
 35C 8.75E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS7SB

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296333 6243049 68m 1m 11m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 8.75E+02
 5C 8.75E+02
 10C 8.75E+02
 15C 8.75E+02

 20C 8.75E+03
 25C 8.75E+03
 30C 8.75E+03
 35C 8.75E+03

 40C 8.75E+03
 45C 8.75E+03
 50C 8.75E+03
 35C 8.75E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS8SA

X(m)Y(m)Ground ElevationHeightHor. spreadVert. spread295916624258076m1m25m1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 9.72E+02
 5C 9.72E+02
 10C 9.72E+02
 15C 9.72E+02

 20C 9.72E+03
 25C 9.72E+03
 30C 9.72E+03
 35C 9.72E+03

 40C 9.72E+03
 45C 9.72E+03
 50C 9.72E+03
 50C 9.72E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS8SB

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295918 6242565 76m 1m 18m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 6.80E+02
 5C 6.80E+02
 10C 6.80E+02
 15C 6.80E+02

 20C 6.80E+03
 25C 6.80E+03
 30C 6.80E+03
 35C 6.80E+03

 40C 6.80E+03
 45C 6.80E+03
 50C 6.80E+03
 50C 6.80E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS8SC

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295914 6242554 76m 1m 25m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

VOLUME SOURCE: NS8SD

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296016 6242539 76m 1m 18m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 0C 6.80E+02
 5C 6.80E+02
 10C 6.80E+02
 15C 6.80E+02

 20C 6.80E+03
 25C 6.80E+03
 30C 6.80E+03
 35C 6.80E+03

 40C 6.80E+03
 45C 6.80E+03
 50C 6.80E+03
 50C 6.80E+03

No gravitational settling or scavenging.

VOLUME SOURCE: N92SA

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296232 6242472 78m 1m 20m 10m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 7.77E+02
 5C 7.77E+02
 10C 7.77E+02
 15C 7.77E+02

 20C 7.78E+03
 25C 7.78E+03
 30C 7.78E+03
 35C 7.78E+03

 40C 7.78E+03
 45C 7.78E+03
 50C 7.78E+03
 50C 7.78E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS9SB

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296336 6242459 78m 1m 23m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 8.75E+02
 5C 8.75E+02
 10C 8.75E+02
 15C 8.75E+02

 20C 8.75E+03
 25C 8.75E+03
 30C 8.75E+03
 35C 8.75E+03

 40C 8.75E+03
 45C 8.75E+03
 50C 8.75E+03
 35C 8.75E+03

No gravitational settling or scavenging.

VOLUME SOURCE: N92SC

X(m)Y(m)Ground ElevationHeightHor. spreadVert. spread296227624244878m1m20m10m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 0C 7.77E+02
 5C 7.77E+02
 10C 7.77E+02
 15C 7.77E+02

 20C 7.77E+03
 25C 7.77E+03
 30C 7.77E+03
 35C 7.77E+03

 40C 7.77E+03
 45C 7.77E+03
 50C 7.77E+03
 50C 7.77E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS9SD

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296338 6242432 78m 1m 25m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 9.72E+02
 5C 9.72E+02
 10C 9.72E+02
 15C 9.72E+02

 20C 9.72E+03
 25C 9.72E+03
 30C 9.72E+03
 35C 9.72E+03

 40C 9.72E+03
 45C 9.72E+03
 50C 9.72E+03
 50C 9.72E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS10SA

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296525 6242459 81m 1m 25m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

VOLUME SOURCE: NS10SB

X(m)Y(m)Ground ElevationHeightHor. spreadVert. spread296514624243381m1m23m1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 8.75E+02
 5C 8.75E+02
 10C 8.75E+02
 15C 8.75E+02

 20C 8.75E+03
 25C 8.75E+03
 30C 8.75E+03
 35C 8.75E+03

 40C 8.75E+03
 45C 8.75E+03
 50C 8.75E+03
 35C 8.75E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS10SC

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296571 6242378 81m 1m 28m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.07E+03
 5C 1.07E+03
 10C 1.07E+03
 15C 1.07E+03

 20C 1.07E+04
 25C 1.07E+04
 30C 1.07E+04
 35C 1.07E+04

 40C 1.07E+04
 45C 1.07E+04
 50C 1.07E+04

No gravitational settling or scavenging.

VOLUME SOURCE: NS11SA

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 297986 6241997 78m 1m 16m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 8.43E+02
 5C 8.43E+02
 10C 8.43E+02
 15C 8.43E+02

 20C 8.43E+03
 25C 8.43E+03
 30C 8.43E+03
 35C 8.43E+03

 40C 8.43E+03
 45C 8.43E+03
 50C 8.43E+03
 50C 8.43E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS11SB

X(m)Y(m)Ground ElevationHeightHor. spreadVert. spread297984624197878m1m15m1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.07E+03
 5C 1.07E+03
 10C 1.07E+03
 15C 1.07E+03

 20C 1.07E+04
 25C 1.07E+04
 30C 1.07E+04
 35C 1.07E+04

 40C 1.07E+04
 45C 1.07E+04
 50C 1.07E+04
 35C 1.07E+04

No gravitational settling or scavenging.

VOLUME SOURCE: NS11SC

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 297979 6241959 78m 1m 16m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 8.43E+02
 5C 8.43E+02
 10C 8.43E+02
 15C 8.43E+02

 20C 8.43E+03
 25C 8.43E+03
 30C 8.43E+03
 35C 8.43E+03

 40C 8.43E+03
 45C 8.43E+03
 50C 8.43E+03
 50C 8.43E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS11SD

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 297987 6241940 78m 1m 21m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

VOLUME SOURCE: NS11SE

X(m)Y(m)Ground ElevationHeightHor. spreadVert. spread297945624191778m1m19m1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 7.29E+02
 5C 7.29E+02
 10C 7.29E+02
 15C 7.29E+02

 20C 7.29E+03
 25C 7.29E+03
 30C 7.29E+03
 35C 7.29E+03

 40C 7.29E+03
 45C 7.29E+03
 50C 7.29E+03
 50C 7.29E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS11SF

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 297981 6241905 78m 1m 19m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 5.83E+02
 5C 5.83E+02
 10C 5.83E+02
 15C 5.83E+02

 20C 5.83E+03
 25C 5.83E+03
 30C 5.83E+03
 35C 5.83E+03

 40C 5.83E+03
 45C 5.83E+03
 50C 5.83E+03
 35C 5.83E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS11SG

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 297980 6241894 78m 1m 19m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 8.42E+02
 5C 8.42E+02
 10C 8.42E+02
 15C 8.42E+02

 20C 8.42E+03
 25C 8.42E+03
 30C 8.42E+03
 35C 8.42E+03

 40C 8.42E+03
 45C 8.42E+03
 50C 8.42E+03
 50C 8.42E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS11SH

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 2978059 6241896 78m 1m 14m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 4.28E+02
 5C 4.28E+02
 10C 4.28E+02
 15C 4.28E+02

 20C 4.28E+03
 25C 4.28E+03
 30C 4.28E+03
 35C 4.28E+03

 40C 4.28E+03
 45C 4.28E+03
 50C 4.28E+03
 35C 4.28E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS11SI

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 298058 6241875 78m 1m 13m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 3.89E+02
 5C 3.89E+02
 10C 3.89E+02
 15C 3.89E+02

 20C 3.89E+03
 25C 3.89E+03
 30C 3.89E+03
 35C 3.89E+03

 40C 3.89E+03
 45C 3.89E+03
 50C 3.89E+03
 50C 3.89E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS12SA

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 298443 6241296 78m 1m 19m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 7.29E+02
 5C 7.29E+02
 10C 7.29E+02
 15C 7.29E+02

 20C 7.29E+03
 25C 7.29E+03
 30C 7.29E+03
 35C 7.29E+03

 40C 7.29E+03
 45C 7.29E+03
 50C 7.29E+03
 50C 7.29E+03

VOLUME SOURCE: NS12SB

X(m)Y(m)Ground ElevationHeightHor. spreadVert. spread298430624127178m1m20m1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 7.77E+02
 5C 7.77E+02
 10C 7.77E+02
 15C 7.77E+02

 20C 7.78E+03
 25C 7.78E+03
 30C 7.78E+03
 35C 7.78E+03

 40C 7.78E+03
 45C 7.78E+03
 50C 7.78E+03
 50C 7.78E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS12SC

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 298424 6241246 78m 1m 20m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 7.77E+02
 5C 7.77E+02
 10C 7.77E+02
 15C 7.77E+02

 20C 7.78E+03
 25C 7.78E+03
 30C 7.78E+03
 35C 7.78E+03

 40C 7.78E+03
 45C 7.78E+03
 50C 7.78E+03
 50C 7.78E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS12SD

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 298497 6241233 78m 1m 29m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.12E+03
 5C 1.12E+03
 10C 1.12E+03
 15C 1.12E+03

 20C 1.12E+04
 25C 1.12E+04
 30C 1.12E+04
 35C 1.12E+04

 40C 1.12E+04
 45C 1.12E+04
 50C 1.12E+04

No gravitational settling or scavenging.

VOLUME SOURCE: NS13SA

X(m)Y(m)Ground ElevationHeightHor. spreadVert. spread298531624084898m1m11m1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 2.92E+02
 5C 2.92E+02
 10C 2.92E+02
 15C 2.92E+02

 20C 2.92E+03
 25C 2.92E+03
 30C 2.92E+03
 35C 2.92E+03

 40C 2.92E+03
 45C 2.92E+03
 50C 2.92E+03
 35C 2.92E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS13SB

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 298543 6240847 98m 1m 11m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 2.92E+02
 5C 2.92E+02
 10C 2.92E+02
 15C 2.92E+02

 20C 2.92E+03
 25C 2.92E+03
 30C 2.92E+03
 35C 2.92E+03

 40C 2.92E+03
 45C 2.92E+03
 50C 2.92E+03
 50C 2.92E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS14SA

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 298584 6240471 78m 1m 24m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

VOLUME SOURCE: NS14SB

X(m)Y(m)Ground ElevationHeightHor. spreadVert. spread29856362405778m1m9m1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.59E+02
 5C 1.59E+02
 10C 1.59E+02
 15C 1.59E+02

 20C 1.59E+03
 25C 1.59E+03
 30C 1.59E+03
 35C 1.59E+03

 40C 1.59E+03
 45C 1.59E+03
 50C 1.59E+03
 50C 1.59E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS15SA

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296875 6240828 77m 1m 14m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 5.35E+02
 5C 5.35E+02
 10C 5.35E+02
 15C 5.35E+02

 20C 5.35E+03
 25C 5.35E+03
 30C 5.35E+03
 35C 5.35E+03

 40C 5.35E+03
 45C 5.35E+03
 50C 5.35E+03
 35C 5.35E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS15SB

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296902 6240821 81m 1m 15m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 5.83E+02
 5C 5.83E+02
 10C 5.83E+02
 15C 5.83E+02

 20C 5.83E+03
 25C 5.83E+03
 30C 5.83E+03
 35C 5.83E+03

 40C 5.83E+03
 45C 5.83E+03
 50C 5.83E+03
 35C 5.83E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS16SA

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296700 6240922 81m 1m 13m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 4.86E+02
 5C 4.86E+02
 10C 4.86E+02
 15C 4.86E+02

 20C 4.86E+03
 25C 4.86E+03
 30C 4.86E+03
 35C 4.86E+03

 40C 4.86E+03
 45C 4.86E+03
 50C 4.86E+03
 35C 4.86E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS17S1

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 298407 6239431 87m 1m 1m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 4.86E+02
 5C 4.86E+02
 10C 4.86E+02
 15C 4.86E+02

 20C 4.86E+03
 25C 4.86E+03
 30C 4.86E+03
 35C 4.86E+03

 40C 4.86E+03
 45C 4.86E+03
 50C 4.86E+03
 50C 4.86E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS17S2

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 298433 6239417 87m 1m 13m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 4.86E+02
 5C 4.86E+02
 10C 4.86E+02
 15C 4.86E+02

 20C 4.86E+03
 25C 4.86E+03
 30C 4.86E+03
 35C 4.86E+03

 40C 4.86E+03
 45C 4.86E+03
 50C 4.86E+03
 35C 4.86E+03

VOLUME SOURCE: NS17S3

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 298459 6239405 87m 1m 13m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 4.86E+02
 5C 4.86E+02
 10C 4.86E+02
 15C 4.86E+02

 20C 4.86E+03
 25C 4.86E+03
 30C 4.86E+03
 35C 4.86E+03

 40C 4.86E+03
 45C 4.86E+03
 50C 4.86E+03
 35C 4.86E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS17S4

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 298484 6239390 87m 1m 13m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 4.86E+02
 5C 4.86E+02
 10C 4.86E+02
 15C 4.86E+02

 20C 4.86E+03
 25C 4.86E+03
 30C 4.86E+03
 35C 4.86E+03

 40C 4.86E+03
 45C 4.86E+03
 50C 4.86E+03
 35C 4.86E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS18S1

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 298062 6239349 88m 1m 11m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 4.38E+02
 5C 4.38E+02
 10C 4.38E+02
 15C 4.38E+02

 20C 4.38E+03
 25C 4.38E+03
 30C 4.38E+03
 35C 4.38E+03

 40C 4.38E+03
 45C 4.38E+03
 50C 4.38E+03
 35C 4.38E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS19S1

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296502 6239859 100m 1m 33m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.26E+03
 5C 1.26E+03
 10C 1.26E+03
 15C 1.26E+03

 20C 1.26E+04
 25C 1.26E+04
 30C 1.26E+04
 35C 1.26E+04

 40C 1.26E+04
 45C 1.26E+04
 50C 1.26E+04

No gravitational settling or scavenging.

VOLUME SOURCE: NS19S2

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296518 6239881 100m 1m 33m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.26E+03
 5C 1.26E+03
 10C 1.26E+03
 15C 1.26E+03

 20C 1.26E+04
 25C 1.26E+04
 30C 1.26E+04
 35C 1.26E+04

 40C 1.26E+04
 45C 1.26E+04
 50C 1.26E+04

No gravitational settling or scavenging.

VOLUME SOURCE: NS19S3

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 296533 6239900 100m 1m 33m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.26E+03
 5C 1.26E+03
 10C 1.26E+03
 15C 1.25E+03

 20C 1.26E+04
 25C 1.26E+04
 30C 1.26E+04
 35C 1.26E+04

 40C 1.26E+04
 45C 1.26E+04
 50C 1.26E+04

VOLUME SOURCE: NS20S1

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 299510 6244912 105m 1m 14m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.78E+02
 5C 1.78E+02
 10C 1.78E+02
 15C 1.78E+02

 20C 1.78E+03
 25C 1.78E+03
 30C 1.78E+03
 35C 1.78E+03

 40C 1.78E+03
 45C 1.78E+03
 50C 1.78E+03
 50C 1.78E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS20S2

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 299520 6244912 105m 1m 14m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.78E+02
 5C 1.78E+02
 10C 1.78E+02
 15C 1.78E+02

 20C 1.78E+03
 25C 1.78E+03
 30C 1.78E+03
 35C 1.78E+03

 40C 1.78E+03
 45C 1.78E+03
 50C 1.78E+03
 50C 1.78E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS20S3

 $\begin{array}{cccc} X(m) & Y(m) & Ground Elevation & Height & Hor. \ spread & Vert. \ spread \\ 299529 & 6244914 & 105m & 1m & 14m & 1m \end{array}$

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.78E+02
 5C 1.78E+02
 10C 1.78E+02
 15C 1.78E+02

 20C 1.78E+03
 25C 1.78E+03
 30C 1.78E+03
 35C 1.78E+03

 40C 1.78E+03
 45C 1.78E+03
 50C 1.78E+03
 50C 1.78E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS20S4

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 299538 6244913 105m 1m 14m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.78E+02
 5C 1.78E+02
 10C 1.78E+02
 15C 1.78E+02

 20C 1.78E+03
 25C 1.78E+03
 30C 1.78E+03
 35C 1.78E+03

 40C 1.78E+03
 45C 1.78E+03
 50C 1.78E+03
 50C 1.78E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS20S5

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 299547 6244894 105m 1m 14m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.78E+02
 5C 1.78E+02
 10C 1.78E+02
 15C 1.78E+02

 20C 1.78E+03
 25C 1.78E+03
 30C 1.78E+03
 35C 1.78E+03

 40C 1.78E+03
 45C 1.78E+03
 50C 1.78E+03
 50C 1.78E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS20S6

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 299532 6244881 105m 1m 13m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.62E+02
 5C 1.62E+02
 10C 1.62E+02
 15C 1.62E+02

 20C 1.62E+03
 25C 1.62E+03
 30C 1.62E+03
 35C 1.62E+03

 40C 1.62E+03
 45C 1.62E+03
 50C 1.62E+03
 50C 1.62E+03

VOLUME SOURCE: NS21S1

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295740 6245746 68m 1m 34m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.75E+03
 5C 1.75E+03
 10C 1.75E+03
 15C 1.75E+03

 20C 1.75E+04
 25C 1.75E+04
 30C 1.75E+04
 35C 1.75E+04

 40C 1.75E+04
 45C 1.75E+04
 50C 1.75E+04

No gravitational settling or scavenging.

VOLUME SOURCE: NS21S2

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295758 6245761 68m 1m 34m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.31E+03
 5C 1.31E+03
 10C 1.31E+03
 15C 1.31E+03

 20C 1.31E+04
 25C 1.31E+04
 30C 1.31E+04
 35C 1.31E+04

 40C 1.31E+04
 45C 1.31E+04
 50C 1.31E+04

No gravitational settling or scavenging.

VOLUME SOURCE: NS21S3

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295783 6245766 68m 1m 34m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.31E+03
 5C 1.31E+03
 10C 1.31E+03
 15C 1.31E+03

 20C 1.31E+04
 25C 1.31E+04
 30C 1.31E+04
 35C 1.31E+04

 40C 1.31E+04
 45C 1.31E+04
 50C 1.31E+04

No gravitational settling or scavenging.

VOLUME SOURCE: NS22S1

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295966 6245055 60m 1m 15m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 5.83E+02
 5C 5.83E+02
 10C 5.83E+02
 15C 5.83E+02

 20C 5.83E+03
 25C 5.83E+03
 30C 5.83E+03
 35C 5.83E+03

 40C 5.83E+03
 45C 5.83E+03
 50C 5.83E+03
 35C 5.83E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS22S2

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295975 6245028 60m 1m 15m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 5.83E+02
 5C 5.83E+02
 10C 5.83E+02
 15C 5.83E+02

 20C 5.83E+03
 25C 5.83E+03
 30C 5.83E+03
 35C 5.83E+03

 40C 5.83E+03
 45C 5.83E+03
 50C 5.83E+03
 35C 5.83E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS23S1

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295724 6244882 65m 1m 15m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

0C 5.05E+02	5C 5.05E+02	10C 5.05E+02	15C 5.05E+02
20C 5.05E+03	25C 5.05E+03	30C 5.05E+03	35C 5.05E+03
40C 5.05E+03	45C 5.05E+03	50C 5.05E+03	

VOLUME SOURCE: NS23S2

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295726 6244907 65m 1m 15m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 5.05E+02
 5C 5.05E+02
 10C 5.05E+02
 15C 5.05E+02

 20C 5.05E+03
 25C 5.05E+03
 30C 5.05E+03
 35C 5.05E+03

 40C 5.05E+03
 45C 5.05E+03
 50C 5.05E+03
 35C 5.05E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS23S3

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295728 6244936 65m 1m 15m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 5.05E+02
 5C 5.05E+02
 10C 5.05E+02
 15C 5.05E+02

 20C 5.05E+03
 25C 5.05E+03
 30C 5.05E+03
 35C 5.05E+03

 40C 5.05E+03
 45C 5.05E+03
 50C 5.05E+03
 35C 5.05E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS24S1

X(m) Y(m) Ground Elevation Height Hor. spread Vert. Spread 295970 6244817 60m 1m 15m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 5.05E+02
 5C 5.05E+02
 10C 5.05E+02
 15C 5.05E+02

 20C 5.05E+03
 25C 5.05E+03
 30C 5.05E+03
 35C 5.05E+03

 40C 5.05E+03
 45C 5.05E+03
 50C 5.05E+03
 35C 5.05E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS24S2

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295972 6244842 60m 1m 15m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 5.05E+02
 5C 5.05E+02
 10C 5.05E+02
 15C 5.05E+02

 20C 5.05E+03
 25C 5.05E+03
 30C 5.05E+03
 35C 5.05E+03

 40C 5.05E+03
 45C 5.05E+03
 50C 5.05E+03
 50C 5.05E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS24S3

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295978 6244864 60m 1m 15m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 5.05E+02
 5C 5.05E+02
 10C 5.05E+02
 15C 5.05E+02

 20C 5.05E+03
 25C 5.05E+03
 30C 5.05E+03
 35C 5.05E+03

 40C 5.05E+03
 45C 5.05E+03
 50C 5.05E+03
 35C 5.05E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS24S4

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295983 6244892 60m 1m 15m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

0C 5.05E+02	5C 5.05E+02	10C 5.05E+02	15C 5.05E+02
20C 5.05E+03	25C 5.05E+03	30C 5.05E+03	35C 5.05E+03
40C 5.05E+03	45C 5.05E+03	50C 5.05E+03	

VOLUME SOURCE: NS25S1

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295338 6244262 75m 1m 15m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 5.83E+02
 5C 5.83E+02
 10C 5.83E+02
 15C 5.83E+02

 20C 5.83E+03
 25C 5.83E+03
 30C 5.83E+03
 35C 5.83E+03

 40C 5.83E+03
 45C 5.83E+03
 50C 5.83E+03
 35C 5.83E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS25S2

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295342 6244289 75m 1m 15m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 5.83E+02
 5C 5.83E+02
 10C 5.83E+02
 15C 5.83E+02

 20C 5.83E+03
 25C 5.83E+03
 30C 5.83E+03
 35C 5.83E+03

 40C 5.83E+03
 45C 5.83E+03
 50C 5.83E+03
 35C 5.83E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS26S1

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295000 6242692 78m 1m 23m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 8.75E+02
 5C 8.75E+02
 10C 8.75E+02
 15C 8.75E+02

 20C 8.75E+03
 25C 8.75E+03
 30C 8.75E+03
 35C 8.75E+03

 40C 8.75E+03
 45C 8.75E+03
 50C 8.75E+03
 35C 8.75E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS26S2

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295023 6242686 78m 1m 23m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 8.75E+02
 5C 8.75E+02
 10C 8.75E+02
 15C 8.75E+02

 20C 8.75E+03
 25C 8.75E+03
 30C 8.75E+03
 35C 8.75E+03

 40C 8.75E+03
 45C 8.75E+03
 50C 8.75E+03
 35C 8.75E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS26S3

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295047 6242685 78m 1m 23m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 8.75E+02
 5C 8.75E+02
 10C 8.75E+02
 15C 8.75E+02

 20C 8.75E+03
 25C 8.75E+03
 30C 8.75E+03
 35C 8.75E+03

 40C 8.75E+03
 45C 8.75E+03
 50C 8.75E+03
 35C 8.75E+03

No gravitational settling or scavenging.

VOLUME SOURCE: NS26S4

X(m) Y(m) Ground Elevation Height Hor. spread Vert. spread 295072 6242687 78m 1m 28m 1m

Emission rates by temperature (5 deg C. categories) in OUV/second:

 OC 1.07E+03
 5C 1.07E+03
 10C 1.07E+03
 15C 1.07E+03

 20C 1.07E+04
 25C 1.07E+04
 30C 1.07E+04
 35C 1.07E+04

 40C 1.07E+04
 45C 1.07E+04
 50C 1.07E+04
 35C 1.07E+04

1

41278 Odour Source 1 to 26 - Naturally Ventilated Sheds

RECEPTOR LOCATIONS

 The Cartesian receptor grid has the following x-values (or eastings):

 294250.m
 294500.m
 295000.m
 295250.m
 295500.m

 296000.m
 296250.m
 296500.m
 296750.m
 297250.m
 297500.m

 297750.m
 298000.m
 298250.m
 298750.m
 299750.m
 299250.m

 299500.m
 298250.m
 298500.m
 298750.m
 299250.m
 299250.m

 299500.m
 299750.m
 30000.m
 300250.m
 300500.m
 300750.m
 301000.m

and these y-values (or northings):

6238500.m 6238750.m 6239000.m 6239250.m 6239500.m 6239750.m 6240000.m 6240250.m 6240500.m 6240750.m 6241000.m 6241250.m 6241500.m 6241750.m 6242000.m 6242250.m 6242500.m 6242750.m 6243000.m 6243250.m 6243500.m 6243750.m 6244000.m 6244250.m 6244500.m 6244750.m 624500.m 6245250.m 6245500.m 6245750.m 6246000.m 6246250.m 6246500.m 6246750.m 62477000.m 6247250.m 6247500.m 6247750.m

METEOROLOGICAL DATA : DECCW Bringelly AWS Data BoM SydneyAP Clouds (SRPGT M

1	Peak values for the 100 worst cases	(in Odour_Units)
	Averaging time = 1 hour	

Rank	Value	Time Red	corded	Coordinates
	ho	ur,date	(* der	notes polar)

1	5.99E+02	24,22/02/08	(298000, 6242000,	0.0)
2	4.97E+02	23,05/02/07	(298000, 6242000,	0.0)
3	4.81E+02	22,26/10/08	(298000, 6242000,	0.0)
4	4.63E+02	24,21/02/07	(298000, 6242000,	0.0)
5	4.61E+02	24,06/02/07	(298000, 6242000,	0.0)
6	4.35E+02	02,03/03/07	(298000, 6242000,	0.0)
7	4.33E+02	22,06/02/07	(298000, 6242000,	0.0)
8	4.30E+02	01,23/02/07	(298000, 6242000,	0.0)
9	4.26E+02	22,02/03/07	(298000, 6242000,	0.0)
10	4.25E+02	24,22/03/07	(298000, 6242000,	0.Ó)
11	4.14E+02	23,04/01/07	(298000, 6242000,	0.0)
12	4.10E+02	01,17/03/07	(298000, 6242000,	0.0
13	4.06E+02	03,23/03/07	(298000, 6242000,	0.0)
14	4.03E+02	22,14/03/08	(298000, 6242000,	0.0)
15	4.03E+02	01,19/03/07	(298000, 6242000,	0.0)
16	4.01E+02	21,15/03/07	(298000, 6242000,	0.0)
17	3.93E+02	23.16/03/07	(298000, 6242000,	0.0)
18	3 91F+02	11.04/04/07	(295750, 6245750,	0.0)
19	3 90E+02	04 20/02/07	(298000 6242000	0.0)
20	3.86F+02	24,23/03/07	(298000, 6242000,	0.0)
21	3.83E+02	24 16/03/07	(298000 6242000	0.0)
22	3.82E+02	04 03/03/07	(298000 6242000	0.0)
23	3.80E+02	21 11/10/07	(295750 6245750	0.0)
24	3 78E±02	21,11,10,07	(295750, 6245750	0.0)
25	3.78E+02	21,02/10/00	(298000 6242000	0.0)
26	3 78E±02	23,22/03/07	(298000, 6242000,	0.0)
27	3 75E+02	11 25/10/08	(295750 6245750	0.0)
27	3.65E±02	0/ 10/02/07	(208000 6242000	0.0)
20	2 65E 1 02	24,13/02/07	(290000, 0242000,	0.0)
27	3.05L+02	02 10/03/07	(298000, 0242000,	0.0)
21	2 545 L 02	22,19/03/07	(290000, 0242000,	0.0)
27	3.50L+02	23,23/02/08	(298000, 0242000,	0.0)
ວ∠ 22	3.50E+02	20 10/02/07	(298000, 6242000,	0.0)
24	3.54L+02	20,19/03/07	(298000, 0242000,	0.0)
34	3.52E+02	02,21/03/07	(290000, 0242000,	0.0)
30	3.50E+02	21,02/03/07	(298000, 6242000,	0.0)
30	3.50E+02	04,17/03/07	(298000, 6242000,	0.0)
37	3.48E+02	21,18/03/08	(298000, 6242000,	0.0)
38	3.40E+02	22,04/12/07	(298000, 6242000,	0.0)
39	3.40E+02	02,05/03/07	(298000, 6242000,	0.0)
40	3.45E+02	21,03/01/07	(298000, 6242000,	0.0)
41	3.42E+02	01,24/03/07	(298000, 6242000,	0.0)
42	3.40E+02	24,25/02/08	(298000, 6242000,	0.0)

43	3.40E+02	07,21/03/07	(295750, 6245750,	0.0)
44	3.35E+02	01,06/03/08	(298000, 6242000,	0.0)
45	3.35E+02	02,06/03/08	(298000, 6242000,	0.0)
46	3.34E+02	03.05/03/07	(295750, 6245750,	0.0)
47	3.34F+02	01,26/02/08	(298000, 6242000,	0.0)
48	3 32E±02	07 24/01/07	(295750 6245750	0.0)
40	2 20E 102	07,24/07/07	(208000 6243730,	0.0)
49	3.30E+02	02,24/03/07	(298000, 8242000,	0.0)
50	3.29E+02	03,22/02/07	(298000, 6242000,	0.0)
51	3.26E+02	07,05/03/07	(295750, 6245750,	0.0)
52	3.24E+02	09,02/10/08	(295750, 6245750,	0.0)
53	3.22E+02	04,21/03/07	(298000, 6242000,	0.0)
54	3.21E+02	03,21/03/07	(298000, 6242000,	0.0)
55	3.21E+02	23,07/01/07	(298000, 6242000,	0.0)
56	3.19E+02	10,03/03/08	(295750, 6245750,	0.0)
57	3.19E+02	02,23/03/07	(298000, 6242000,	0.0)
58	3.18E+02	01,10/01/07	(298000, 6242000,	0.0)
59	3.18E+02	03.13/02/08	(298000, 6242000,	0.0)
60	3 18E+02	12 10/03/07	(295750 6245750	0.0)
61	3 16E+02		(298000 6242000	0.0)
62	2 15E + 02	22 05/02/09	(208000, 6242000,	0.0)
62	3.15L+02	23,03/03/08	(298000, 0242000,	0.0)
03	3.15E+02	03,04/03/07	(298000, 6242000,	0.0)
04	3.11E+02	24,05/03/08	(298000, 6242000,	0.0)
65	3.10E+02	05,23/03/07	(298000, 6242000,	0.0)
66	3.08E+02	20,18/04/07	(298000, 6242000,	0.0)
67	3.07E+02	24,22/01/07	(298000, 6242000,	0.0)
68	3.06E+02	23,09/12/08	(298000, 6242000,	0.0)
69	3.05E+02	04,26/01/07	(298000, 6242000,	0.0)
70	3.05E+02	19,08/03/07	(298000, 6242000,	0.0)
71	3.04E+02	01,12/03/08	(298000, 6242000,	0.0)
72	3.04E+02	02,12/03/08	(298000, 6242000,	0.0
73	3.02E+02	22.22/03/07	(298000, 6242000,	0.0)
74	3 00F+02	23,21/03/07	(298000, 6242000,	0.0)
75	2 99E+02	05 01/03/07	(298000 6242000	0.0)
76	2.77E+02	05 20/02/07	(298000, 6242000,	0.0)
70	2.99L+02	22 16/02/07	(298000, 0242000,	0.0)
77	2.99L+02	23,10/02/07	(298000, 0242000,	0.0)
78	2.99E+02	03,03/03/07	(298000, 6242000,	0.0)
/9	2.96E+02	22,16/03/07	(298000, 6242000,	0.0)
80	2.95E+02	23,15/02/07	(298000, 6242000,	0.0)
81	2.94E+02	04,13/03/08	(298000, 6242000,	0.0)
82	2.93E+02	23,30/01/07	(298000, 6242000,	0.0)
83	2.90E+02	23,22/02/08	(298000, 6242000,	0.0)
84	2.90E+02	21,30/01/07	(298000, 6242000,	0.0)
85	2.88E+02	05,03/03/07	(298000, 6242000,	0.0)
86	2.87E+02	22,13/02/07	(298000, 6242000,	0.0)
87	2.87E+02	16,28/05/07	(295750, 6245750,	0.0)́
88	2.87E+02	01.27/01/07	(298000, 6242000,	0.0)
89	2.86E + 02	03 19/03/07	(298000 6242000	0.0)
90	2.84E±02	04 20/03/07	(298000 6242000	0.0)
01	2.01E+02	21 01/12/08	(298000 6242000	0.0)
02	2.042+02	21,01/12/00	(298000, 6242000,	0.0)
7Z	2.03E+02	24,03/03/07	(270000, 0242000, (20000, (20000))	0.0)
73 04	2.03E+U2		(298000, 6242000,	0.0)
94	2.83E+02	22,30/12/08	(298000, 6242000,	0.0)
95	2.82E+02	09,03/10/08	(295/50, 6245750,	0.0)
96	2.82E+02	21,22/03/07	(298000, 6242000,	0.0)
97	2.81E+02	21,03/04/07	(298000, 6242000,	0.0)
98	2.81E+02	19,16/04/07	(298000, 6242000,	0.0)
99	2.81E+02	02,04/03/07	(298000, 6242000,	0.0)
100	2.81E+02	24,22/10/07	(298000, 6242000,	0.0)