National Integrated Creative Solutions

ABN 54 877 348 873

Aim to Excel in all Aspects of Business

Appendix B

Air Quality Impact Assessment

STATE WASTE SERVICES (NSW) PTY LTD

AIR QUALITY IMPACT ASSESSMENT
STATE WASTE SERVICES (NSW) PTY LTD
9 KENOMA PLACE ARNDELL PARK

Prepared for: Stimson & Baker Planning
State Waste Services (NSW) Pty Ltd

Prepared by: Nicolas Israel, Director
Reviewed by: Nicolas Israel, Director

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We Speak your Environmental Language

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ABBREVIATIONS & GLOSSARY OF TERMS

AHD	Australian Height Datum
Appropriate Regulatory Authority (ARA)	Generally, the appropriate regulatory authority is the EPA for licensed premises and local Council for non-licensed premises. There are exceptions to this definition as stated in Clause 6 of the POEO Act.
AS	Australian Standard
AWS	Automatic Weather Station
BCA	Building Code of Australia
BOM	Bureau of Meteorology
Council	Blacktown City Council
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEC	NSW Department of the Environment and Conservation
DECC	NSW Department of Environment and Climate Change
Environment	As defined in the POEO Act, *"environment" means components of the earth, including:* *(a) land, air and water, and* *(b) any layer of the atmosphere, and* *(c) any organic or inorganic matter and any living organism, and* *(d) human-made or modified structures and areas,* *and includes interacting natural ecosystems that include components referred to in paragraphs (a)-(c).*
EPA	NSW Environment Protection Authority
Harm	As defined in the POEO Act, *"harm" to the environment includes any direct or indirect alteration of the environment that has the effect of degrading the environment and, without limiting the generality of the above, includes any act or omission that results in pollution.*
Immediately	Promptly and without delay.
Material risk of harm	"Material risk of harm to the environment" is defined under Section 147 of the POEO Act as: *(a) harm to the environment is material if:* *(i) It involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or* *(ii) It results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations), and* (b) *loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and*

	practicable measures to prevent, mitigate or make good harm to the environment.
mg	Milligram (g x 10^{-3})
µg	Microgram (g x 10^{-6})
µm	Micrometre or micron (metre x 10^{-6})
m^3	Cubic metre
NEPC	National Environment Protection Council
NHMRC	National Health and Medical Research Council
Occupier	As defined under the POEO Act, *"occupier" of premises means the person who has the management or control of the premises.*
OU	Odour Units; concentration of odorous mixtures in odour units. The number of odour units is the concentration of a sample divided by the odour threshold or the number of dilutions required for the sample to reach the threshold. This threshold is equivalent to when 50% of a testing panel correctly detect an odour
OUV	Odour Unit Volumes; odour units are not concentrations but are a ratio. As such, they may not be used to represent an odour emission. It is necessary to multiply the source odour level (OU) by the volume of air emitted per second, to produce an odour emission rate. Typically odour emission rates may be expressed as OUV/s (point/volume sources) and OUV/m^2/s (area sources) with units of OU.m^3/s and OU.m^3/m^2/s respectively.
PM_{10}	Particulate matter less than 10 microns in aerodynamic diameter
$PM_{2.5}$	Particulate matter less than 2.5 microns in aerodynamic diameter
Pollution	As defined under the POEO Act*, "pollution" means:* *(a) water pollution, or* *(b) air pollution, or* *(c) noise pollution, or* *(d) land pollution.*
Pollution Incident	The *Environmental Guidelines: Preparation of pollution incident response management plans* defines a pollution incident as: "…an incident or set of circumstances during or as a consequence of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed of on premises, but it does not include an incident or set of circumstances involving only the emission of any noise."

Premises	As defined under the POEO Act*, "premises" includes:* *(a) a building or structure, or* *(b) land or a place (whether enclosed or built on or not), or* *(c) a mobile plant, vehicle, vessel or aircraft.*
Prevention of pollution	Use of processes, practices, materials or products that avoid, reduce or control pollution, which may include recycling, treatment, process changes, control mechanisms, efficient use of resources and material substitution. Note: The potential benefits of prevention of pollution include the reduction of adverse environmental impacts, improved efficiency and reduced costs.
Scheduled activity	"scheduled activity" means an activity listed in Schedule 1 of the POEO Act. Scheduled activities must be licensed under the POEO Act.
Site	Part of 1725 Elizabeth Drive, Kemps Creek NSW
Spill kit	A set of equipment used to isolate or control an accidental overflow or release of a substance or material.
SWS	State Waste Services (NSW) Pty Ltd which is the occupier of the site and operator of the business subject to this report. It is also referred to as the proponent.
TSP	Total Suspended Particulate
USEPA	United States Environmental Protection Agency
WHO	World Health Organisation

EXECUTIVE SUMMARY

National Integrated Creative Solutions (NICS) was engaged by Stimson & Baker Planning on behalf of the State Waste Services (NSW) Pty Ltd (proponent) to prepare an Air Quality Impact Assessment (AQIA) for the proposed increase in processing capacity from 650 tonnes to 3,000 per year at the waste management facility located at 9 Kenoma Place, Arndell Park NSW.

The nature of the waste types to be processed was and continues to be mainly medical waste collected from hospitals, medical centres, etc. Due to the type of activities and the manner the clinical wastes are collected and processed onsite, it was clearly evident that the only potential air quality aspect that was and continues to be of any relevance for this facility is odour generated at different stages of the process. Hence, dust emissions were considered negligible and did not warrant any further assessment. This observation is based on our extensive experience with similar activities and processes and was also confirmed during our inspections of the facility at different times and stages of the process.

We understand that the increase in processed materials is associated mainly with the closure of other similar facilities in NSW and the increase in the generation of such waste due to increase in population.

The currently approved capacity is based on the plant being operated 5 short days per week despite the fact that the Development Consent permits the activities to operate Monday to Saturday from 7.00 am to 7.00 pm. The proposed increase will not change the current hourly air emissions from the activities but rather the overall daily emissions due to the fact that the Autoclave can process only one (1) tonne load per hour. The approved hours being 7.00 am - 7.00 pm Monday to Saturday may change to 7.00 am – 7.00 pm seven days per week.

It should be noted that the facility has been operating for over there (3) years now and no complaints about any aspect of the activities have been received by any Government Department. In general, this is a very good indication of the minimal impact of the facility on the surrounding environment including residential, commercial and industrial premises.

This report presents all information associated with the odour emission assessment of different scenarios of the operations. This includes scenarios that involve the potential of a broken bag being ripped open during its transfer from the sealed bin into the processing bin (called also drawer) and prior to being treated in the autoclave. It includes also a comprehensive methodology of calculating all odour emission rates and considering internal fugitive odour emissions as a volume source.

The proposal involves the operation of one (1) autoclave, processing materials storage bin, processed materials shredder and a finished products (processed materials) bin. The main system that comprises the steam management includes the pipes that transfer the steam from the autoclave into a water tank, a steam dissipater, a water storage tank, a filtering system and a closed loop water recycling system. This system is part of the facilities odour mitigation measures since it was initially considered that the main potential odour emission point was the steam released from the autoclave during the treatment of waste. A steam relief valve is also installed at

the high point of the autoclave as an emergency measure in case of increased pressure and to avoid serious incidents. This scenario was also included in the modelling.

The AQIA has been prepared in accordance with the NSW EPA guidelines "*Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales"*, "*Technical framework - Assessment and management of odour from stationary sources in NSW"* and "*Technical notes - Assessment and management of odour from stationary sources in NSW*". The assessment was undertaken by adopting the methodologies outlined within these guidelines, including the selection of meteorological data, the collection of appropriate odour emission data, calculation/estimation of odour emission rates, and the set-up and use of a NSW EPA-approved dispersion model to accurately simulate the emissions from the subject site.

Due to the fact that reliable odour emission data from similar activities could not be found in the literature, it was determined that the most appropriate methodology is to collect samples from different stages of the process where odour emissions are likely to be emitted to the atmosphere. These samples were delivered to a NATA accredited laboratory for olfactometry testing (Odour Research Laboratories Australia). This is the most accurate and representative method of obtaining real time odour emission values for the activities.

Odour modelling was undertaken using AERMOD, which is a NSW EPA-approved air dispersion modelling program. Output from the modelling provides prediction of ground level odour concentrations at the nearest potentially affected receptors from the subject site, which are typically residential premises. Considerations were also made to surrounding commercial/industrial premises which might find the potential odour impacts from the facility to be a nuisance.

All scenarios including worst case scenario demonstrated clear compliance with the 2 ODU criteria at all potentially sensitive residential receptors without the need to implement any additional mitigation measures other than those already installed on site. Despite the fact that compliance with the 6 ODU criteria at nearby commercial/industrial premises was achieved and to provide the authorities with greater confidence that under any adverse operating, weather and/or environmental conditions the activities will comply with even lower limits, we have recommended the implementation of additional mitigation measures at the most potentially odour generating sources.

The proposed operations will satisfy the acceptable odour levels. Approval is requested.

Nicolas Israel
Director

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Attachment 3: Samples of Odour Impact Modelling Contours
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Attachment 5: Manufacturers Specifications for Odour Mitigation Measures

1. INTRODUCTION

National Integrated Creative Solutions (NICS) was engaged by Stimson & Baker Planning on behalf of the State Waste Services (NSW) Pty Ltd (proponent) to prepare an Air Quality Impact Assessment (AQIA) for the proposed increase in processing capacity from 650 tonnes to 3,000 per year at the waste management facility located at 9 Kenoma Place, Arndell Park NSW. This AQIA is required to support a Development Application (DA).

The nature of the waste types to be processed was and continues to be mainly medical waste collected from hospitals, medical centres, etc. Due to the type of activities and the manner the clinical wastes are collected and processed onsite, it was clearly evident that the only potential air quality aspect that was and continues to be of any relevance for this facility is odour generated at different stages of the process. Hence, dust emissions were considered negligible and did not warrant any further assessment. This observation is based on our extensive experience with similar activities and processes and was also confirmed during our inspections of the facility at different times and stages of the process.

The proposed development includes the increase of processed waste materials from 650 to 3,000 tonnes per year. No other changes are required since the site has been operating for over three (3) years now without any issues of concern or complaints from the community. Greater details of the proposed development and activities undertaken on the site are presented in the main Environmental Impact Statement.

This report presents also a brief description of the existing site and its various activities, including the surrounding environment, and an assessment of potential odour impacts of the proposed development. The assessment has been carried out, as practically and reasonably possible in accordance with the requirements listed in the document, "*Approved Methods for the Modelling and Assessment of Air Pollutants in NSW"* published by the Department of Environment and Climate Change NSW (DECC NSW 2005) as well as other guidelines that are listed in the reference section. However, the assessment outlines the air quality assessment criteria based also on:

- The Protection of the Environment Operations Act 1997
- The Protection of the Environment Operations Regulation 2009
- Identifying potentially sensitive receptors
- Analysing potential odour generation from the activities
- The appropriate control measures, if any, needed to ensure compliance

It should be noted that due to the fact that the proposed activities and the machinery used have been previously assessed and approved by relevant authorities, it was considered appropriate to utilise the air quality-related information obtained from these assessments rather than re-do the same assessments for the same activities and machinery. However, we were unable to locate reliable data specific for this site, to utilise in our assessment including modelling, we considered it necessary to obtain real time odour emission concentrations from these activities by taking air samples from the potentially odour emission locations and stages of the activities.

1.1 Scope

The odour impact assessment has included the following scope of works:

- A review of the proposed site operations,
- Undertake research to obtain emissions data that best represents the potential odour emissions from the site,
- Take air samples from the different stages of the process, in particular where potential odour emissions are likely,
- Provide comprehensive and detailed calculations of all required values including odour emission rates,
- Modelling of the proposed operations of the facility to determine the worst-case potential odour impacts at the nearest potentially affected sensitive receptors,
- An assessment of the predicted levels of odour against NSW EPA guidelines,
- The compilation of a report containing a summary of methods and a statement of the potential odour impacts from the proposed development,
- Provide a statement of potential air quality impacts, as well as recommendations if necessary.

1.2 The Proponent

The proponent is State Waste Services (NSW) Pty Ltd (SWS) with an ABN 90 122 623 170. Based on an ASIC search the Company was established in 2006. SWS supply products and services to meet the strictest infection control standards in the handling, treatment and disposal of clinical waste. SWS clinical waste bins and sharps collectors meet relevant standards, and SWS clinical waste treatment facility, including its processes, is approved by NSW Health and the Environment Protection Authority.

SWS supply clean, fully lined clinical waste bins that are collected on a tailored schedule and transported to its licenced waste treatment facility. Waste is then treated using state of the art steam sterilisation technology before being shredded and disposed. SWS focus is on infection control at every stage during the process; protecting the integrity of its clients' accreditation commitments.

The proponent's details are provided below.

Physical address:	9 Kenoma Place, Arndell Park NSW 2171
Postal address:	PO Box 7363 Baulkham Hills NSW 2153
Current applicant contact details are:	
Phone:	1300 462 720
Website:	statewaste.com.au
Grid reference:	303933E and 6259038N (Middle of site)
(DGA94 – MGA 56)	303933E and 6259062N (Street address)
Zone:	56 (Blacktown LEP 2015)
Elevation:	53 m
Local Government Area:	Blacktown City Council
Land Use Zoning:	IN1 – General Industrial

SWS is an Australian owned and operated company which was established in 2006.

2. SITE DESCRIPTION

A brief outline of the subject site has been provided below.

2.1 Description of Site and Surrounds

The land which is the subject of this application is known as being **Lot 14, DP 786328, H/N 9 Kenoma Place, Arndell Park** in the Local Government Area of Blacktown City Council and in the State of New South Wales.

The subject site is located within an existing industrial area at Lot 14, DP 786328, H/N 9 Kenoma Place, Arndell Park. The site is surrounded by other industrial and commercial activities, such as metals sales, motor vehicle repairs, forklift hires & repairs and general storage operations. The subject site is zoned IN1 General Industrial pursuant to Blacktown Local Environmental Plan (BLEP) 2015.

The site has an area of approximately 1,492 m^2, having a road frontage of 25.5m to the cul-de-sac head of Kenoma Place and a depth of 38m. The site enjoys vehicular access to the surrounding well serviced local road network, with access to the regional road network of the Great Western Highway, M4 and M7 via Doonside Road and Eastern Road.

The existing industrial premises have a floor area of approximately 570 m^2 and include 2 offices and a conference room, two small kitchens and staff amenities. In the front building elevation, there are two roller shutter door openings, which will allow for direct loading and unloading access to the internal ground floor area. A site plan and floor layout plan are provided in **Figure 2-9** (and **Attachment 4**).

The site is surrounded by the following sites:

- North – Kenoma Place
- South – Lot 222 DP 786329 (23 Lidco Street) and Lot 223 DP 786329 (25 Lidco Street)
- West – SP 85841
- East – Lot 15 DP 786328 (7 Kenoma Place)

The site's driveway starts at street level (Kenoma Place) with an approximate elevation of 53 m. The driveway has a slight incline of about 0.2 m along its entire length until it reaches the front yard of the site where vehicles load empty bins and unload full bins. This fully concreted area is also used for vehicle maneuvering and a car park for employees and visitors. A summary of site details are provided in **Table 2-1**.

Table 2-1: Summary of Site Details

Location	Lot 14, DP 786328, H/N 9 Kenoma Place, Arndell Park
Land Dimensions (Approximate)	Northern Boundary: 25 m Eastern Boundary: 19 m North Easter Boundary : 31 m Southern Boundary: 44 m Western Boundary: 39 m
Total Area (Approximate)	Approximately 1,492m^2 or 0.1492 Ha
Grid Reference (GDA94 – MGA56)	Middle of Site = Easting: 303933 Northing: 6259038 Elevation: 53 Street Address = Easting: 303933 Northing: 6259062 Elevation: 53
Driveways	Existing Driveway = length: 13 m width: 8 m
Local Government Area	Blacktown City Council
Existing Land Use	The site is surrounded by commercial and industrial activities as permitted within the land use zone
Current Land Zoning	IN1 – General Industrial
Proposed Development	Increase of clinical waste processing from 650 to 3,000 tonnes per year

To give the reader a better understanding of the location of the site, **Figures 2-1, 2-2 and 2-3** show aerials view of the site in the local context including the surrounding activities/developments.

Extract from the land zoning map showing the subject site location is presented in **Figure 2-4**.

Figure 2-1: Aerial View of the Site including Surrounding Areas – Closer View

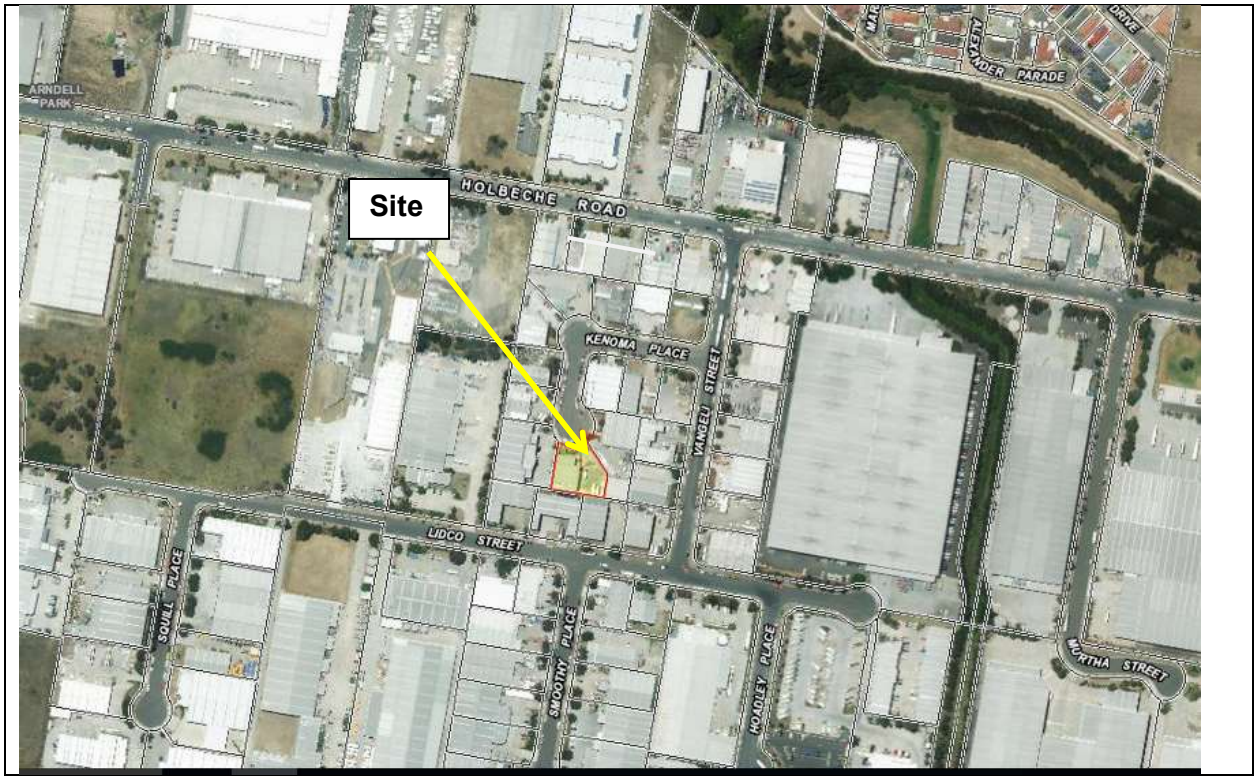


Figure 2-2: Aerial View of the Site including Surrounding Areas – Closer View

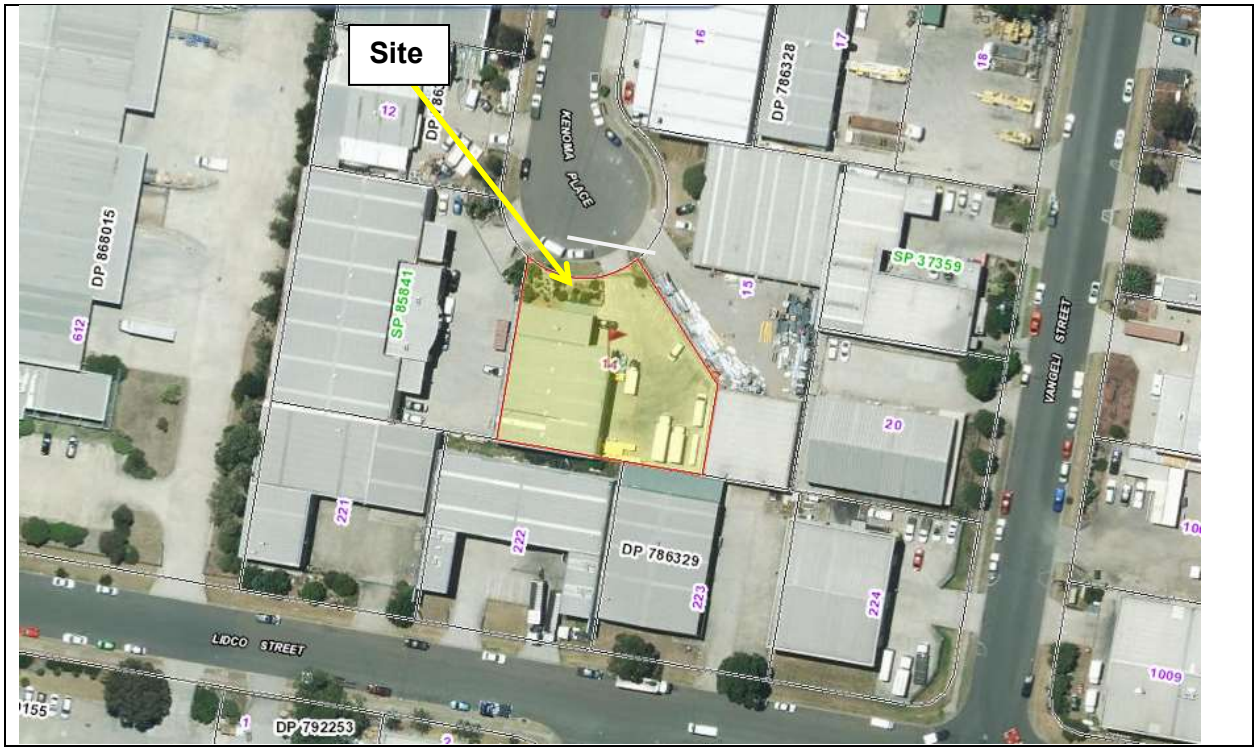


Figure 2-3: Aerial View of the Site – Closer View

Figure 2-4: Location of the Site within the Zone IN1 – General Industrial

As previously stated, the site is located within an existing industrial area in Arndell Park. The subject site is zoned IN1 General Industrial pursuant to Blacktown Local Environmental Plan (BLEP) 2015. The proposed development complies with the provisions of Blacktown Development Control Plan (DCP) 2015. The proposal has also been assessed against the objectives and provisions within State Environmental Planning Policy (SEPP) No. 33 – Hazardous and Offensive Development. In this regard the proposal satisfactorily addresses the matters listed under Clause 13 of the SEPP, including compliance with the relevant circulars and guidelines produced by the Department of Planning and Environment, consultation with public authorities, consideration of feasible alternatives and consideration of any likely future surrounding land use. The assessment under SEPP 33 has concluded that the proposal is neither hazardous nor offensive development. The proposed "waste management facility" is therefore a permissible land use under Council's IN1 General Industrial zoning with development consent.

2.2 LOCAL TERRAIN

Two three-dimensional views of the site have been provided as **Figure 2-5** and **Figure 2-6**, showing the location of the site and nearest identified receptors from the subject site. The first figure shows the terrain with the z-axis (i.e. vertical axis) exaggerated by a factor of 10 (i.e. a given distance on the x-axis or y-axis appears ten times as great on the z-axis) in order to provide a clearer description of the topography. The second figure, with all axes equally scaled, shows the terrain as it actually exists when viewed in a conventional three dimensional view. A coloured scale bar shows elevations corresponding to the colours used in the figures. It should be noted that these figures are an approximation of the actual terrain, based on terrain information obtained from satellite imagery.

As shown in these figures, the terrain is considered slightly undulating in nature but is not expected to heavily influence odour impacts from the subject site.

Figure 2-5: Three-Dimensional View of Terrain of the Region with an Exaggerated Z-Axis (Z-Axis Increased by Factor of 10)

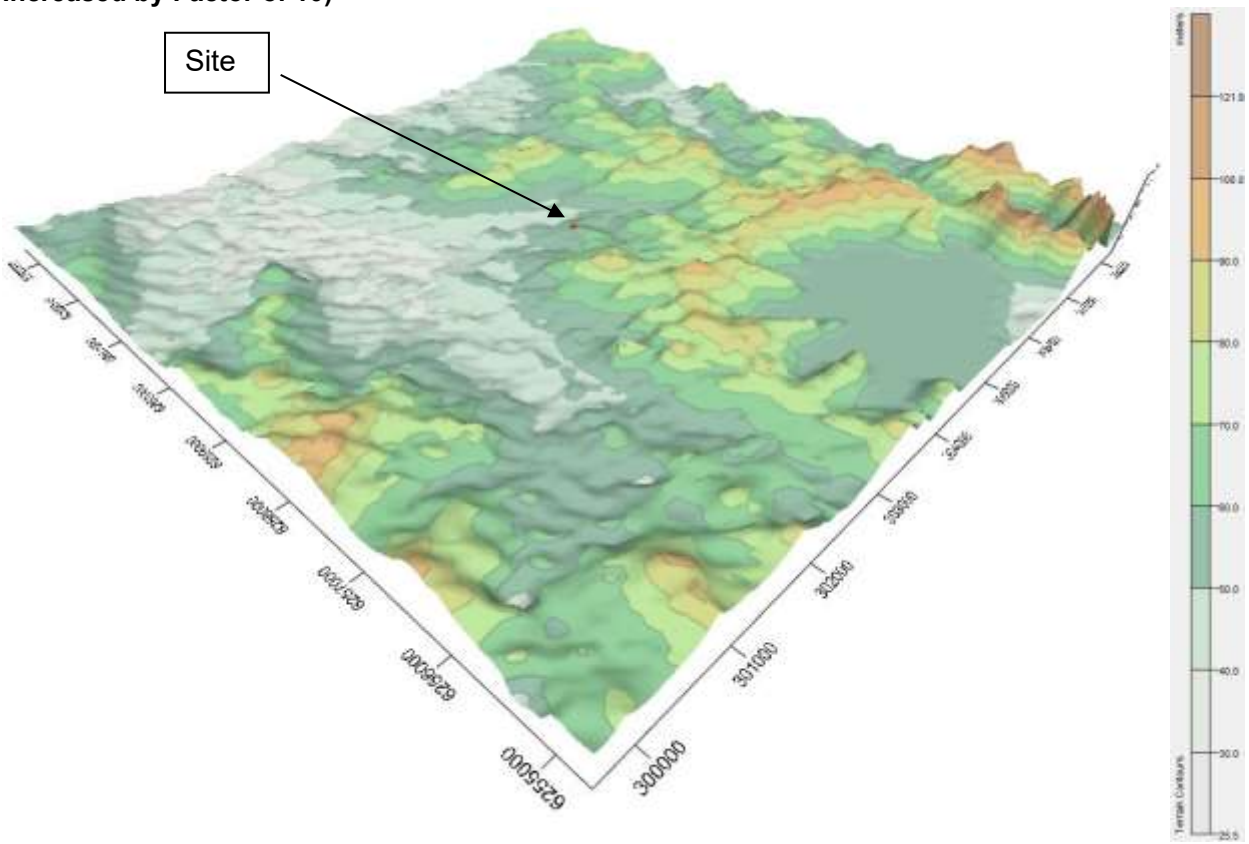
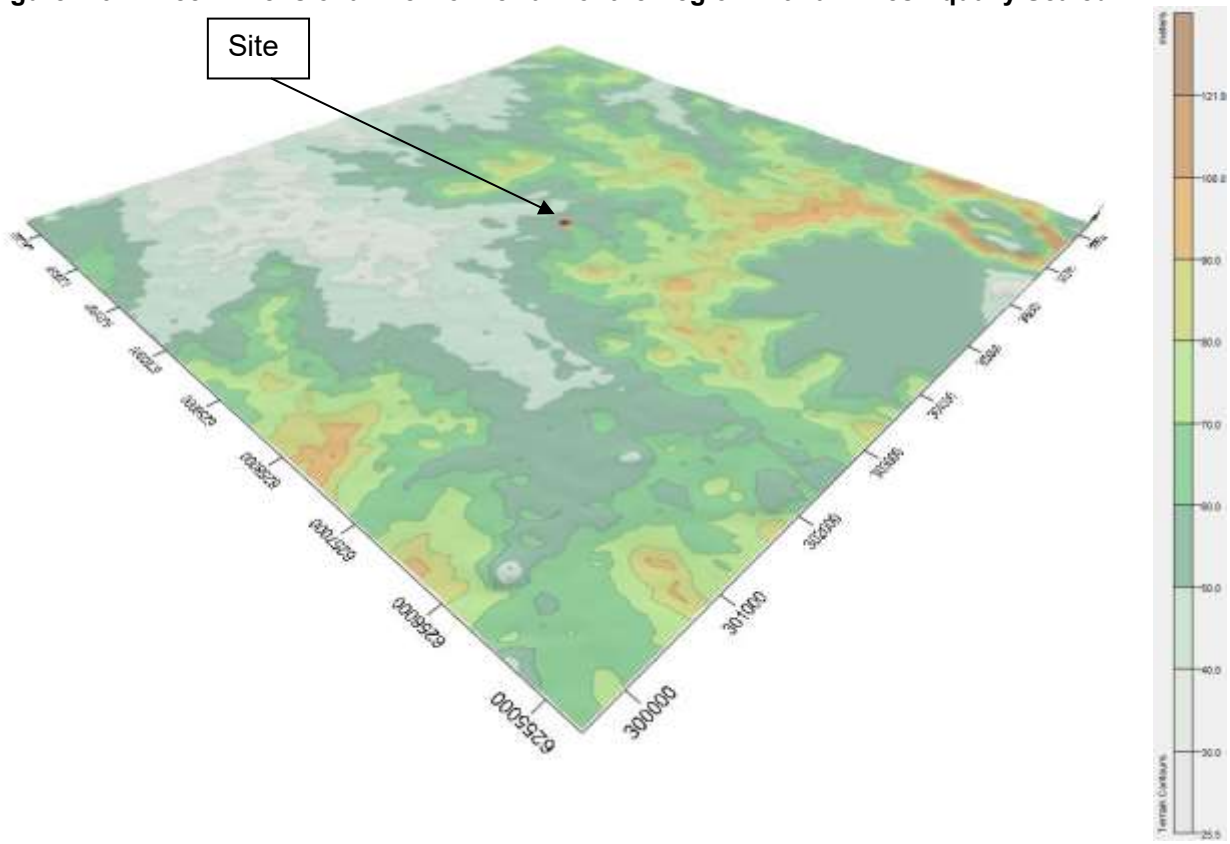


Figure 2-6: Three-Dimensional View of Terrain of the Region with all Axes Equally Scaled



2.3 Potentially Sensitive Residential Receptors

As previously stated, the site is surrounded by commercial/industrial premises and a number of nearby residential dwellings outside the industrial area.

The activities will be well shielded from the surrounding environment by the existing built environment such as the topography of the site, the fact that the activities will be conducted inside a building and the high and large neighbouring commercial and industrial buildings.

Based on the EPA's document "*NSW DEC (EPA) Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales – August 2005*", the following definition of sensitive receptor is provided: "***Sensitive Receptor -*** *A location where people are likely to work or reside; this may include a dwelling, school, hospital, office or public recreational area. ……".* However, as the site is located within a IN1 – General Industrial where a variety of activities are permitted, it was considered appropriate to pay a greater attention to the location of the site relative to the residential zoned areas.

In any case, based on our assessment during our inspections of the site and surrounding environment, the proposed activities are unlikely to have any adverse impact on any sensitive residential receptor under any adverse weather and operating conditions. Similarly, the proposed activities are unlikely to have any impact on the neighbouring commercial/industrial properties provided that the recommended mitigations measures are implemented and maintained at all times.

The closest potentially sensitive residential receptors are included in **Table 2-2** and shown in an aerial photo which is provided in **Figure 2-7** (and **Attachment 1**). However, the closest neighbouring and potentially affected commercial/industrial receptors are included in **Table 2-3** and shown in an aerial photo which is provided in **Figure 2-8** (and **Attachment 1**).

Table 2-2: Closest Potentially Sensitive Residential Receptors

Receptor ID	Address	Lot & DP	Approximate distance to site boundary (m)	Easting	Northing	Elevation
R1	170 Reservoir Road Arndell Park	Lot 201 DP 880404	1,100 E	305263	6258730	64
R2	61 Holbeche Road Blacktown	Lot 1 DP 832346	560 NE	304478	6259305	50
R3	92 Aliberti Drive Blacktown	Lot 63 DP 869788	500 NE	304386	6259319	50
R4	1 Mariko Place Blacktown	Lot 98 DP 869788	400 N	304142	6259408	49
R5	52 De Castella Drive Blacktown	Lot 242 DP 842110	690 N	303872	6259768	48
R6	15 Flemming Grove Doonside	Lot 10 DP 975002	1,140 NW	303188	6259965	44
R7	711 Great Western Highway Eastern Creek	Lot 1 DP 723384	1,980 W	301940	6258973	40
R8	47 Pikes Lane Eastern Creek	Lot 3E DP 436196	2,160 SW	301824	6258596	42
R9	50 Peter Brock Drive Eastern Creek	Lot 4 DP 1079897	1,370 S	303922	6257475	75

Table 2-3: Closest Neighbouring Commercial/Industrial Receptors

Receptor ID	Address	Lot & DP	Approximate distance to site boundary (m)	Easting	Northing	Elevation
R10	14 Kenoma Place Arndell Park	Lot 12 DP 786328	Immediately Surround Site NW	303883	6259092	53
R11	16 Kenoma Place Arndell Park	SP85841	Immediately surround Site W	303889	6259048	54
R12	21 Lidco Street Arndell Park	Lot 221 DP 786329	Immediately surround Site SW	303879	6259005	55
R13	23 Lidco Street Arndell Park	Lot 222 DP 786329	Immediately surround Site S	303918	6259007	54

R14	25 Lidco Street Arndell Park	Lot 223 DP 786329	Immediately surround Site SE	303953	6258994	54
R15	7 Kenoma Place Arndell Park	Lot 15 DP 786328	Immediately surround Site NE	303961	6259049	53

The discrete residential receptors listed in **Table 2-2** were considered in the computer modelling. Similarly, the discrete neighbouring commercial/industrial receptors listed in **Table 2-3** were also considered in the computer modelling.

Figure 2-7: Closest Potentially Sensitive Residential Receptors

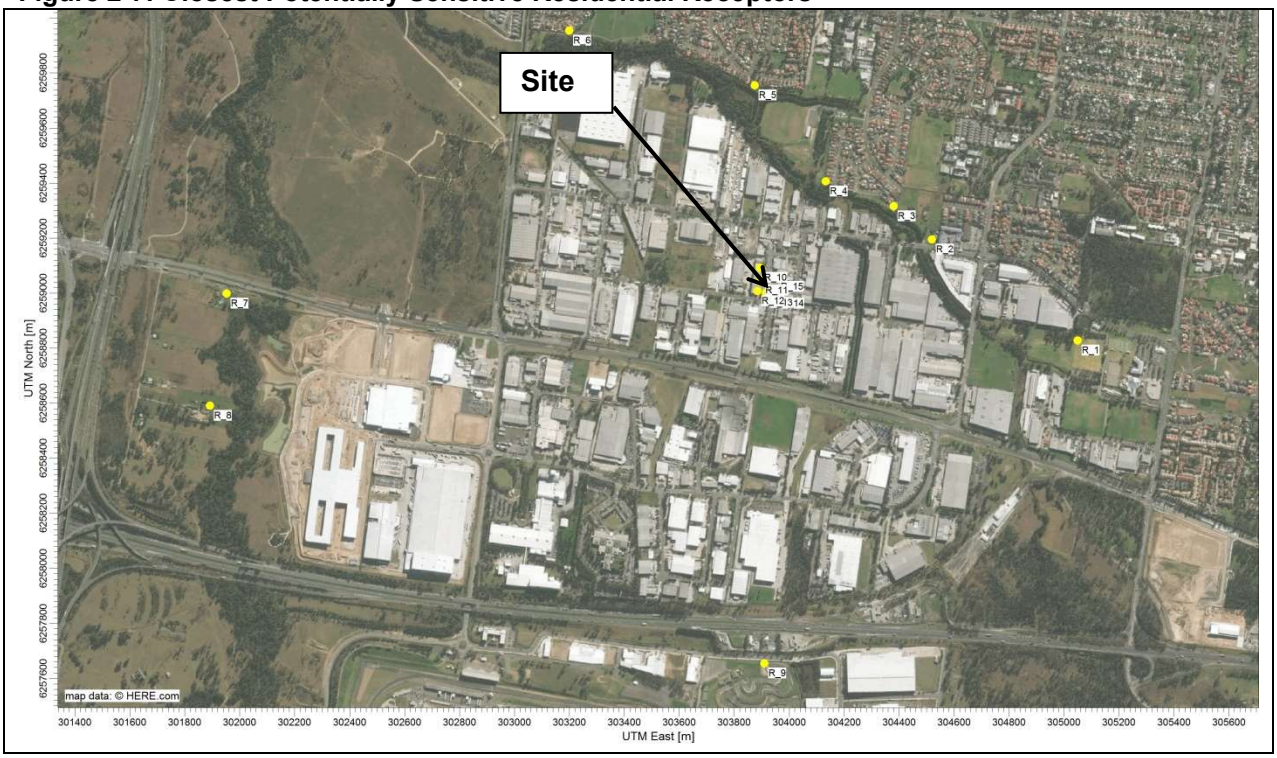


Figure 2-8: Closest Neighbouring Commercial/Industrial Receptors

2.4 Operations Review

2.4.1 Proposed Activities

Full details of the activities undertaken by SWS on site are included in the main EIS. In summary, the normal operations include the receiving of waste materials (medical waste) inside the double bagged/lined bins, weigh the bins, empty the bins into the processing bins which are lined with a special heavy duty plastic liner to ensure that the materials are fully sealed again during the treatment inside the autoclave. All bagged waste materials remain as they are inside the double bags until they are inside the autoclave. None of the waste materials is left in the open at any stage of the process. The processing bins are then wheeled into the autoclave which is locked and the treatment process commences. The treatment process takes approximately 1 hour to complete to ensure compliance with the NSW Department of Health and the NSW Environment Protection Authority's requirements. The temperature in the autoclave will rise to approximately 140^{o}C to ensure that the processed waste materials are subjected to complete destruction of all potentially infectious materials and rendered safe for disposal as General Solid Waste. The processed materials are then placed in the shredder to be shredded and then the shredded materials are placed in the final processed materials bin. This bin is taken on a weekly basis to a lawfully licensed facility which is licensed to accept this type of waste (General Solid Waste). **In summary, the process transforms medical waste into general solid waste without any incineration**. For this type of waste, this process is the most environmentally friendly and safest process currently exists not only in Australia but all across the world. It has been approved by the most relevant organisations worldwide.

All waste materials are processed on the same day to ensure that any potential health and/or environmental implications are prevented as a result of the storage of the waste materials overnight.

It should be noted that despite the fact that the waste materials are mostly dry solid materials, the whole building is fully bunded to prevent any potentially spilled materials from leaving the building under severe weather conditions.

The collected waste materials are classified by the EPA as being clinical and related waste and the waste code is R100.

2.4.2 List of Machinery and Processed Materials

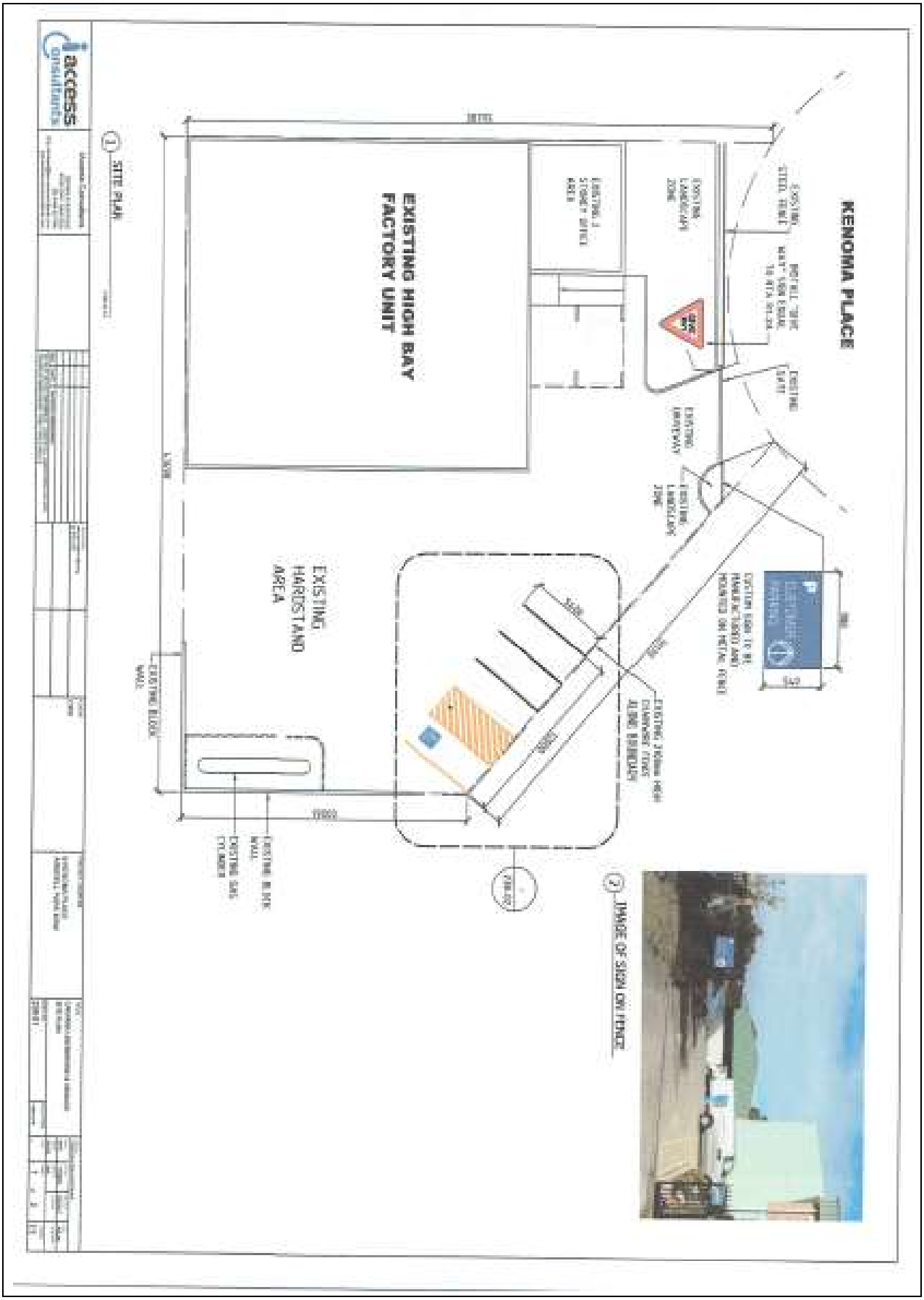
The list of machinery that is required to be used for the processing of waste materials is presented below.

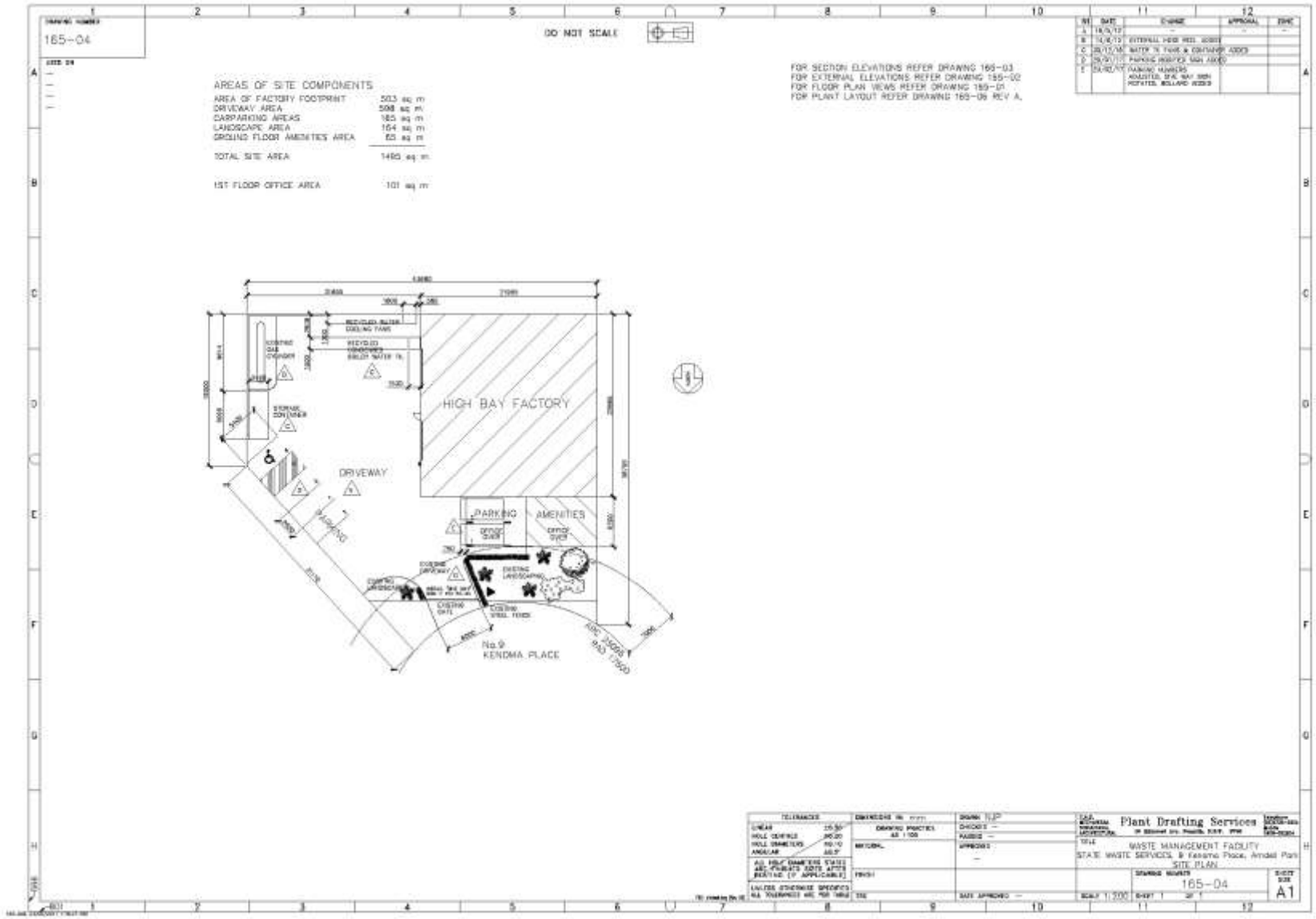
The site layout is shown in **Figure 2-9** and **Attachment 1**.

1 **Machinery list for processing of waste materials**
- Vans,
- Trucks,
- Waste collection bins,
- Scale,

- Waste processing bins,
- Processed waste bin,
- Autoclave,
- Small boiler,
- Pipes,
- High pressurised water cleaner.

Figure 2-9: Site Layout




165-04
DO NOT SCALE
AREAS OF SITE COMPONENTS
AREA OF FACTORY FOOTPRINT 503 sq m
DRIVEWAY AREA 598 sq m
CARPARKING AREAS 185 sq m
LANDSCAPE AREA 164 sq m
GROUND FLOOR AMENITIES AREA 63 sq m
TOTAL SITE AREA 1495 sq m
1ST FLOOR OFFICE AREA 101 sq m
FOR SECTION ELEVATIONS REFER DRAWING 165-03
FOR EXTERNAL ELEVATIONS REFER DRAWING 165-02
FOR FLOOR PLAN VIEWS REFER DRAWING 165-01
FOR PLANT LAYOUT REFER DRAWING 165-06 REV A.
HIGH BAY FACTORY
DRIVEWAY
PARKING
AMENITIES
No.9
KENDMA PLACE
Plant Drafting Services
WASTE MANAGEMENT FACILITY
STATE WASTE SERVICES, 9 Kendma Place, Arndell Park
SITE PLAN
165-04
A1

2.5 Hours of Operation

Under normal circumstances, the hours of operation would depend on demand. However, existing approved hours of operation are:

- Monday to Saturday 7:00am - 7.00pm

It is proposed that these hours could be reviewed in 12-18 months to ensure that the market demand do not cause additional constraints on the employees and the company. It is proposed that these hours be extended to seven days per week to provide the company with flexibility just in case there were any breakdowns in any plant or equipment to ensure that the materials are processed promptly as soon as the repairs are completed. There are also many other reasons why flexibility is extremely important in this business including the fact that in some cases, collection of such materials from emergency wards could be required on Sundays.

2.6 Photographic Section

It was considered appropriate to include photos of several structures and equipment used in the SWS facility as well as other aspects associated with the facility to give the reader a better view of the facility. **Figure 2-10** includes these photos.

Figure 2-10: Site Photos


Bins cleaning area
Lined & sealed waste processing bin
Autoclave

3. METEOROLOGY AND LOCAL AIR QUALITY

3.1 Local meteorology

The closest monitoring station to the subject site is the Horsley Park Equestrian Centre Automatic Weather Station (AWS) (Station No. 67119) operated by the Bureau of Meteorology (BoM). This monitoring station is located approximately 7.2 km south south west of the subject site. Data at this monitoring station are logged hourly and was used in accordance with the NSW EPA air dispersion modelling guidelines. The year selected for the assessment was 2015, which is the most complete and recent datasets available from the monitoring station that are compliant for use in the modelling in accordance with the NSW EPA guidelines.

Figure 3-1 shows the 2015 all-hours annual wind rose for Horsley Park. The annual wind climate in the area is dominated by flows from the southwest. To a lesser extent, winds from the south and south east are also prevalent. Winds from the northwest, northeast and southeast have the lowest frequency of occurrence.

It is the incidence of daytime winds that are of greatest concern with regards to the transport and dispersion of odour emissions from the site. Due to the nature of operations, the majority of odour generated at the site would be during operational hours when processing activities are undertaken, except from the water tank. **Figure 3-2** shows the annual and seasonal all hours wind climate. Odour movements can become significant under strong winds (greater than 5 m/s).

3.1.1 Atmospheric Stability

The “stability” of the atmosphere is a classification used to describe the structure of the atmosphere in terms of temperature, specifically, how temperature changes in the atmosphere with altitude. Classification is often done according to the Pasquill-Gifford classification system that consists of six stability class groups, shown in **Table 3-1**. The class “A” describes an atmosphere where the air is well-mixed and there is little hindrance of dispersion into the atmosphere. At the other end of the scale is class “F”, which describes conditions under which temperature inversions would occur, where winds are calm or absent and air close to the earth surface, cannot rise into the atmosphere due to the presence of warmer air layers above. The classes in between A and F indicate changing degrees of stability due to variations in temperature in the atmosphere.

Table 3-1: Pasquill-Gifford Stability Class System

Stability Class	Description
A	Extremely Unstable
B	Unstable
C	Slightly Unstable
D	Neutral
E	Slightly Stable
F	Very Stable

Worst case dispersion conditions for emissions would occur during F-class stability conditions – generally associated with still/light winds and clear skies during the night or early morning period (stable conditions).

Analysis of the referenced site-specific meteorological data indicates the F-class dispersion conditions were present for much less 10% of the time in the Horsley Park (2015) meteorological file, suggesting that there is a mild risk of enhanced impacts due to this weather condition.

Based on the Met files, it can be deduced that stability class frequencies in the meteorological file indicate the dominance of moderate still / stable conditions. Stability class D is the most frequent, with an occurrence of approximately 45%, which is to be expected as it is typically considered dominant during daytime, sunrise and sunset. Stability classes A, B and C, which offer the best dispersion conditions, occur with frequencies of approximately 10%, 8% and 14% respectively. This analysis suggests that less dispersive conditions predominantly occur or are to be expected to occur within the area throughout a typical year. Enhanced air emission impacts would then be expected.

3.1.2 Wind Rose Plots

Wind rose plots show the direction from which the wind is coming with triangles known as “petals”. The petals of the plots in the figure summarise wind direction data into 8 compass directions i.e. north, north-east, east, south-east, etc. The length of the triangles, or “petals”, indicates the frequency that the wind blows from the direction presented. Longer petals for a given direction indicate a higher frequency of wind from that direction. Each petal is divided into segments, with each segment representing one of the six wind speed classes. Thus, the segments of a petal show what proportion of wind for a given direction falls into each class. The proportion of time for which wind speed is less than speeds in the first class (i.e. 0.5 m/s), when speed is negligible, is referred to as calm hours or “calms”. Calms are not shown on a wind rose as they have no direction, but the proportion of time that constitutes the period under consideration is noted under each wind rose. The concentric circles in each wind rose are the axes that denote wind frequencies. In comparing the plots it should be noted that the axes vary between wind roses, although all wind roses are the same size. The frequencies shown in the first quadrant (top-left quarter) of each wind rose are stated beneath the diagram.

3.1.3 Local Wind Trends

Figure 3-1 and **Figure 3-2** present the wind rose plots for the Horsley Park AWS monitoring station (Station No. 67119). **Figure 3-1** contains the information prepared for the whole year 2015 (Annual all hours), while **Figure 3-2** contains the information prepared for the different seasons in year 2015 (Seasonal all hours).

At Horsley Park in 2015, **Figure 3-2** shows that winds from the south-west dominated over the course of the year, with a frequency of approximately 19%. All other directions contributed

wind with frequencies of approximately 11% or less. During the summer period, winds frequently blew from the south east and east at around 16% each. Other main wind directions included south (14%) and south west (12%), with winds least likely to blow from the west or north-west. Autumn shows slower winds, with south-westerly winds dominating at 26%, and all other directions contributing less than 13% each. The main wind direction continued to be from the south-west (22%) in winter, westerly winds contributing around 17%, with winds from north and north west at 12% or less. Winds were least likely to occur from the north-east, east or south east during winter. In spring though, winds were fairly equally represented, with the largest occurrence being south-westerlies (16%); all other wind directions contributed with frequencies of around 13% or less.

Figure 3-1: Annual wind rose (all hours) – Horsley Park 2015

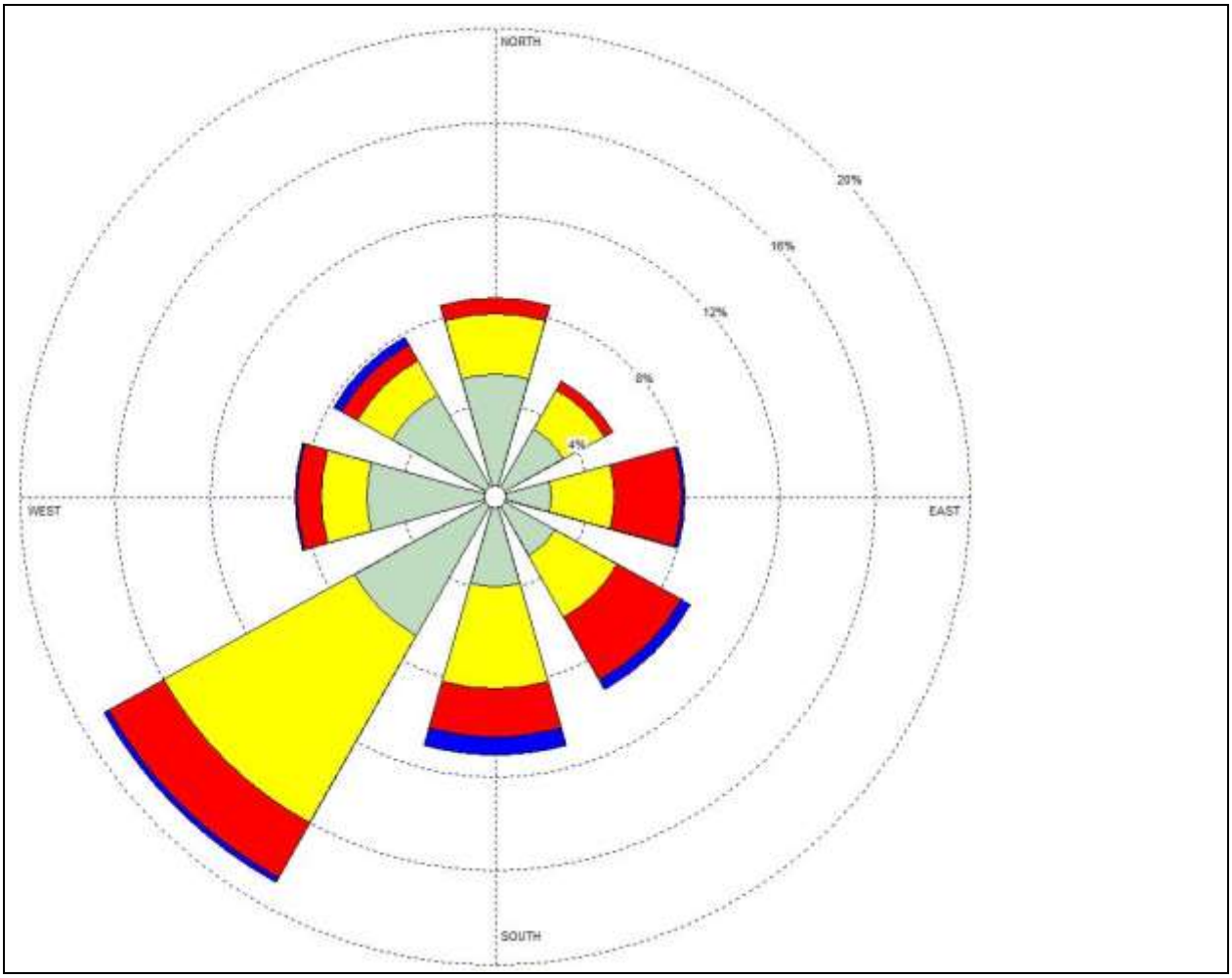
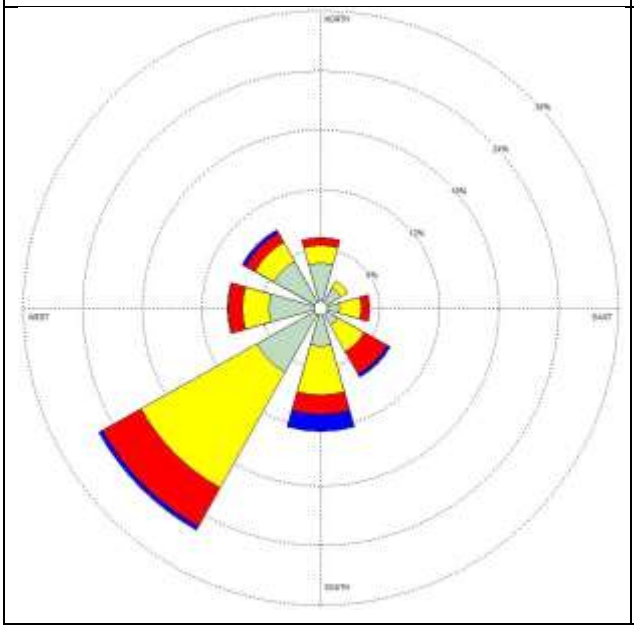
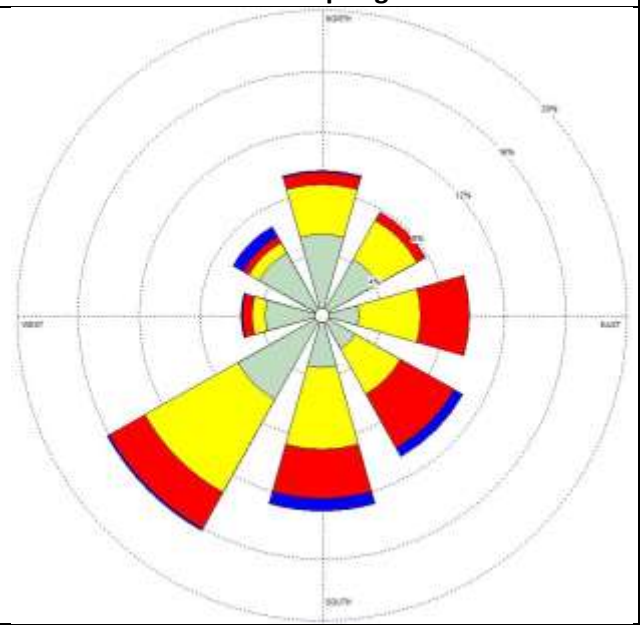
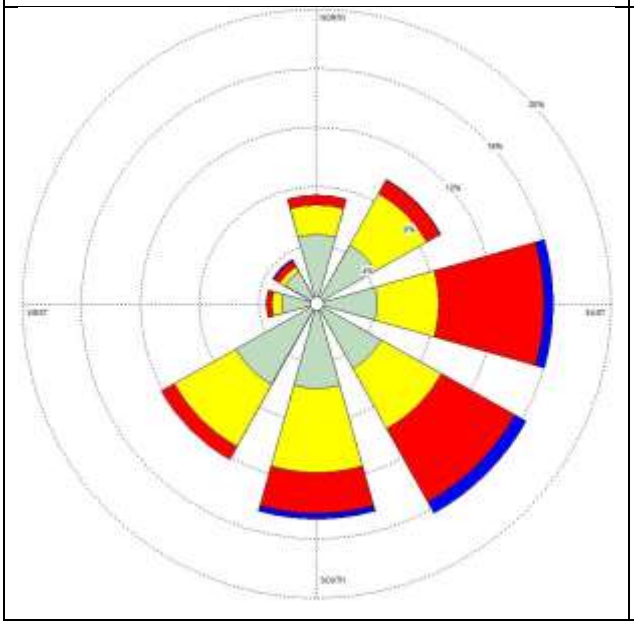
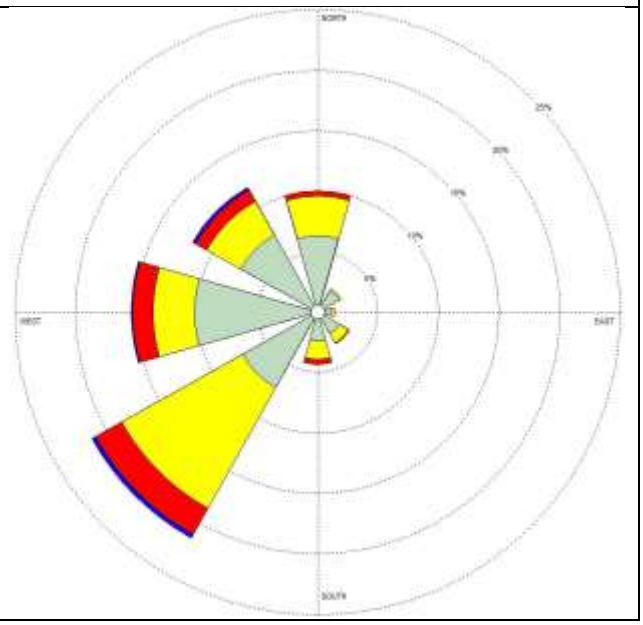


Figure 3-2: Seasonal all hours wind rose charts – Horsley Park 2015

Wind Rose 2015 Autumn – All hours	Wind Rose 2015 Spring – All Hours
	

Wind Rose 2015 Summer – All Hours	Wind Rose 2015 Winter – All Hours
	

3.1.4 Local Air Quality

Odour emissions attributable to businesses identified to be located within proximity to the subject site were determined to be minimal, given the nature of the businesses. There may be occasional odours observed from the waste management facilities at Eastern Creek. However it is envisaged to be infrequent and thus associated impacts would be minimal. There may be also very rare odours observed from the identified car repair business which is adjacent to the subject site. However the associated impacts would be minimal because the operation area is fully enclosed.

It is expected that odour impacts that would be predominantly observed as background concentrations for the identified receptors would only be those from traffic movements on Kenoma Place, Vangeli Street and Lidco Street. Odours from these transport activities would be very minimal and short-lived.

3.2 Air Quality Criteria and Guidelines

3.2.1 Protection of Environment Operations Act 1997 (POEO Act)

The Protection of the Environment Operations Act 1997 (POEO Act) applies the following definitions relating to air pollution.

"Air pollution" *means the emission into the air of any air impurity.*

While "air impurity" includes smoke, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, mists, odours and radioactive substances.

The following clauses of this Act have most relevance to the site.

3.2.1.1 Clause 124 (Operation of Plant)

The occupier of any premises who operates any plant in or on those premises in such a manner as to cause air pollution from those premises is guilty of an offence if the air pollution so caused, or any part of the air pollution so caused, is caused by the occupier's failure:

a) to maintain the plant in an efficient condition, or
b) to operate the plant in a proper and efficient manner.

Where premises is defined within the POEO Act as including: (a) a building or structure, or (b) land or a place (whether enclosed or built or not), or a mobile plant, vehicle, vessel or aircraft.

3.2.1.2 Clause 126 (Dealing with Materials)

(1) The occupier of any premises who deals with materials in or on those premises in such a manner as to cause air pollution from those premises is guilty of an offence if the air pollution so caused, or any part of the air pollution so caused, is caused by the occupiers failure to deal with those materials in a proper and efficient manner.

(2) In this section:

a) deal with materials means process, handle, move, store or dispose of the materials.

b) materials include raw materials, materials in the process of manufacture, manufactured materials, by-products or waste materials.

3.2.1.3 Clause 127 Proof of causing pollution

To prove that air pollution was caused from premises within the meaning of Sections 124 – 126, it is sufficient to prove that air pollution was caused on the premises, unless the defendant satisfies the court that the air pollution did not cause air pollution outside the premises.

3.2.1.4 Clause 128 Standards of air impurities not to be exceeded

(1) The occupier of any premises must not carry on any activity, or operate any plant, in or on the premises in such a manner as to cause or permit the emission at any point specified in or determined in accordance with the regulations of air impurities in excess of:

a) The standard of concentration and the rate, or

b) The standard of concentration or the rate.

c) Prescribed by the regulations in respect of any such activity or any such plant.

(2) Where neither such a standard nor rate has been so prescribed, the occupier of any premises must carry on any activity, or operate any plant, in or on the premises by such practicable means as may be necessary to prevent or minimise air pollution.

The subject site would be required to adhere to the above listed legislative requirements.

3.2.2 NSW Waste Classification Guidelines

Since the waste received on site is classified as special waste under the NSW Waste Classification Guidelines – Part 1: Classifying waste, we provide the following definitions to assist the reader to get a better understanding of current waste classification of these materials.

Special waste is a class of waste that has unique regulatory requirements. The potential environmental impacts of special waste need to be managed to minimise the risk of harm to the environment and human health. Special waste means any of the following:

- clinical and related waste
- asbestos waste
- waste tyres
- anything classified as special waste under an EPA gazettal notice.

Generators of special waste do not need to make any further assessment of their waste if it falls within the definitions of special wastes.

The only exception to this is where special waste is mixed with restricted solid or hazardous waste. In these circumstances, the waste must be classified as special waste and restricted solid or hazardous waste (as applicable), and managed as both of those classifications.
The meanings of the terms clinical and related waste, asbestos waste, and waste tyres are detailed below.

Clinical and related waste

Clinical and related waste means:

- clinical waste
- cytotoxic waste
- pharmaceutical, drug or medicine waste
- sharps waste.

Clinical waste means any waste resulting from medical, nursing, dental, pharmaceutical, skin penetration or other related clinical activity, being waste that has the potential to cause injury, infection or offence, and includes waste containing any of the following:

- human tissue (other than hair, teeth and nails)
- bulk body fluids or blood
- visibly blood-stained body fluids, materials or equipment
- laboratory specimens or cultures
- animal tissue, carcasses or other waste from animals used for medical research

but does not include any such waste that has been treated by a method approved in writing by the Director-General of NSW Health.

Cytotoxic waste means any substance contaminated with any residues or preparations that contain materials that are toxic to cells principally through their action on cell reproduction.

Pharmaceutical, drug or medicine waste means waste that has been generated by activities carried out for business or other commercial purposes and that consists of pharmaceutical or other chemical substances specified in the Poisons List made under section 8 of the *Poisons and Therapeutic Goods Act 1966*.

Sharps waste means any waste collected from designated sharps waste containers used in the course of business, commercial or community service activities, being waste resulting from the use of sharps for any of the following purposes:

- human health care by health professionals and other health care providers
- medical research or work on cadavers
- veterinary care or veterinary research
- skin penetration or the injection of drugs or other substances for medical or non-medical reasons

but does not include waste that has been treated on the site where it was generated, and to a standard specified in an EPA gazettal notice.

Sharps means those things:

- ❖ that have sharp points or edges capable of cutting, piercing or penetrating the skin (such as needles, syringes with needles or surgical instruments)
- ❖ that are designed for the purpose of cutting, piercing or penetrating the skin
- ❖ that have the potential to cause injury or infection.

3.3 Adopted Criteria and Guidelines

The guidelines referenced in this assessment were the New South Wales Environment Protection Authority (NSW EPA) documents as follows:

- *"Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales"* (August 2005).
- *"Technical framework - Assessment and management of odour from stationary sources in NSW"* (November 2006) and
- *"Technical notes - Assessment and management of odour from stationary sources in NSW"* (November 2006).

Table 3-4 demonstrates how the odour criteria recommended by the NSW EPA varies with population.

Table 3-2: NSW EPA Odour Performance Criteria

Size of Affected Community	Odour Performance Criteria (Odour Units) (to be complied with for 99.0% of the time)
Urban (Population ≥ ≈ 2000)	**2.0 OU**
Population ≈ 500	3.0 OU
Population ≈ 125	4.0 OU
Population ≈ 30	5.0 OU
Population ≈ 10	6.0 OU
For single residential areas (≤ ≈ 2)	7.0 OU

Given the nature of the regional location of the site and the industrial area with surrounding well-established residential areas, it is appropriate to utilise an odour assessment criteria of 2.0 OU for all residential receptors.

The subject site is located within Arndell Park industrial area. We believe that the odour assessment criterion of 6.0 OU is the appropriate criterion for the commercial/industrial premises. Considering that these are not dwellings and given that the residential dwellings would be considered to be more sensitive when it comes to odour observations, the use of two levels of odour is appropriate.

The NSW EPA guidelines also set 7 odour units as an assessment criterion for the maximum odour level an individual should be exposed to.

The detection of odour is not an indication that criteria is being exceeded, rather the strength of the odour would be the basis of the exceedances.

4. ODOUR IMPACT ASSESSMENT

4.1 Adour Impact Modelling

The NSW EPA-approved air dispersion model, AERMOD, was used for the quantification of air impacts from the proposed development. The methods used to quantify the impacts through AERMOD have been conducted in accordance with the NSW EPA modelling guidelines.

AERMOD is a steady-state plume model accurately (if not conservatively) predicts ground level concentration impacts where local topography does not significantly and adversely affect plume migration. The model was used to estimate the concentration impacts on receptors for each hour of input meteorology. Within the AERMOD dispersion model, technical options are available to simulate plume behaviour affected by the presence of buildings. Atmospheric dispersion curves and surface roughness heights were selected which specifically represented the site conditions present.

Site-specific meteorological data was used (described in Section 3.1 in accordance with the NSW EPA modelling guidelines. Contribution due to the effects associated with the presence of buildings on and within proximity to the subject site was also accounted for in the AERMOD model. Emission rates were calculated for all potential odour sources based on the real time sampling results and were used conservatively using reasonable and/or practical assumptions.

4.1.1 Odour Sampling and Results

As previously stated due to the lack of reliable data associated with odour emissions from similar activities, it was considered necessary to obtain real time odour emission values to be used in the computer modelling. This would be the best and most accurate representation of the odour emissions of the activities undertaken on site.

As part of the air sampling regime it was considered necessary to take samples representative of the different stages of the process to ensure that all possible odour emission scenarios are included in the assessment (odour dispersion modelling).

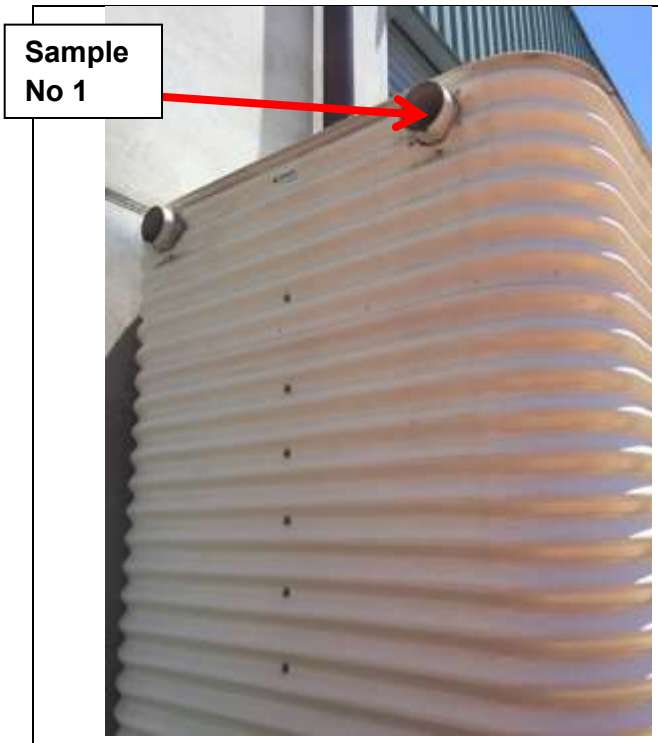
Despite the fact that the waste materials are contained within double bags while being transported from the collection bins to the processing bins, we considered that there could be a chance of the waste materials to be exposed. For that reason we decided to take a sample of a potentially broken bag. Similarly, we considered worst case scenarios in all our sampling locations and conditions. We believe that these conditions or scenarios will never occur.

All samples were collected in accordance with AS4323.3 and all sampling bags were placed in new black odourless heavy duty garbage bags. These bags were delivered to the testing laboratory as soon as (within one hour) sampling was completed to ensure that the sampling weather conditions were very similar to the weather conditions when the samples were delivered to the laboratory. The meteorological conditions obtained from a portable weather station are included in **Table 4-1** as well as the wind speed and direction which were obtained from the Horsley Park automatic Weather Station which is the closest to the site... Photos of air sampling locations are included in **Figure 4-1**.

Table 4-1: Meteorological Conditions on 1 December 2016

General	Sunny – fine – clear sky
Temperature (°C)	36.3
Relative Humidity (%)	23
Barometric Pressure (mbar)	1012
Wind Speed (Km/h)	22
Wind Direction	S

Figure 4-1: Photos of Air Sampling Locations



Water tank and openings where we took air sample No 1

Processed materials bin where we took air sample No 2

Open bag where we took air sample No 3

Waste procesing bin where we took sample No 4 and the duplicate sample

Air sampling locations and results of the olfactometry testing are included in **Table 4-2. Attachment 4** includes the full report of Olfactometry testing as provided by the odour testing company.

Table 4-2: Air sampling locations and results of olfactometry testing

Location	Sampling Date & Time	Analysis Date & Time	Panel	Sample Odour Concentration (OU)	Sample Odour Concentration (OU)	Odour Character & Hedonic Tone
Water Tank Air Space	01/12/2016 @ 12:06	02/12/2016 @ 10:30	4	8,200	8,200	Sour milk, raw meat, toilet cleaner, chlorine, bleach, paint, chocolate powder, menthol, minty, chocolate mint (+1.0)
Final Processed Waste Bin	01/12/2016 @ 12:27	02/12/2016 @ 11:00	4	1,500	1,500	Garbage, meat, chocolate, burnt plastic, minty (-3.5)
Open Bag of Raw Waste	01/12/2016 @ 12:35	02/12/2016 @ 11:30	4	900	900	Garbage, urinal deodorant blocks, hospital cleaning products, medicinal meat, fishy, burnt plastic, vinyl, menthol, swampy, earthy, rotten (-3.5)
Raw Waste Processing Bin	01/12/2016 @ 12:40	02/12/2016 @ 12:00	4	420	420	Hospital cleaning product, urinal deodorant block, soap, disinfectant, meat, butcher shop (-3.0)
Raw Waste Processing Bin - Duplicate	01/12/2016 @ 12:47	02/12/2016 @ 12:30	4	540	540	Vegetable, fruit, hospital cleaning product, urinal deodorant block, soap, disinfectant, meat, minty, musty, swampy (-2.0)

4.1.2 Qualitative Odour Assessment

Based on information obtained from the proponent, the activities were previously subjected to a qualitative odour assessment by an authorised officer of the EPA. The officer confirmed that no odour could be detected outside the building and most certainly outside the premises boundary. We also undertook similar qualitative odour assessment and found the same result. The only odour that could be detected was a mild pleasant disinfectant odour inside the building. We confirm that we were unable to detect any odours associated with the SWS activities outside the building.

The qualitative odour assessment was undertaken on 1 November 2016 and the meteorological conditions obtained from a portable weather station are included in **Table 4-3** as well as the wind speed and direction were obtained from the Horsley Park automatic Weather Station which is the closest to the site.

Table 4-3: Meteorological Conditions on 21 November 2016

General	Sunny – fine
Temperature (^{o}C)	30.5
Relative Humidity (%)	41
Barometric Pressure (mbar)	1014
Wind Speed (Km/h)	11
Wind Direction	Mostly SE

4.1.3 Odour Emission Rate (OER) Inputs

4.1.3.1 Source Configuration Technique

Fugitive odour sources have traditionally been modelled as volume sources. The EPA prefers that in this case similar approach be taken and that all fugitive odour emissions located within the building and outside should follow the volume source methodology. These sources are the incoming waste storage bins and the processed waste bin. However, for the steam released into the atmosphere through a stack via the emergency pressure relief valve, the source was considered as single odour emission point source at the stack. In addition the water tank unit which is fully enclosed with two (2) small openings was included as two (2) point source emissions; one for each opening. To the exception of all that is the clean water used to clean all used bins prior to being disinfected, dried, lined and stored for the next use. This water is discharged directly to sewer under a trade waste agreement with Sydney Water. In any case, there will be negligible odour emissions from clean water in comparison with the other sources and when considering the conservative approach used and the worst case scenarios considered in this assessment, it is clearly evident that the odour emissions from the clean water can be left out as it would have negligible contribution to the total fugitive odour emissions.

4.1.3.2 Identification of Emission Sources

Odours have been identified to be released from the following areas on site:

- Water tank unit where steam released from the outer skirt of the autoclave is directed into this water tank to remove odours. This water tank unit is fully enclosed with 2 small opening. Each opening was considered as a single point source (point odour emissions),
- Incoming waste processing bins (fugitive odour emissions),
- Processed waste bin (fugitive odour emissions), and
- Stack serving the steam released through the emergency pressure relief valve (point odour emissions).

Odour emissions from the operation of the water tank unit are expected to be significant and would dominate all other sources that have been found to be present on site. Therefore, it was necessary to include it as part of the assessment as the main source of odour. However, the impact from that odour source may not be of great importance due to the fact that the tank is practically fully enclosed except the 2 small openings.

Odours from storage bins of incoming and processed materials are expected to be low, given that the storage of these wastes would be fully enclosed and would be sealed appropriately. However, these odours may have greater impact on the overall odour contribution at the receptors due to the large size of the roller doors. The storage method would be in compliance with the appropriate waste guidelines and will be treated on a daily basis to ensure that odour releases are not caused unnecessarily. It would be in the best interest of site management to avoid release of odours from these bins and to treat all materials received on that day, due to the potential concern for occupational health and safety associated with the release of odours from these types of wastes, if they remain on site for long periods.

Odour emissions from the operation of vehicles on site were considered to be very minimal and were excluded in the assessment.

4.1.3.3 Peak-to-Mean Ratios

One of the parameters that need to be set to run in dispersion models is the averaging time parameter. In the case of odour, the NSW EPA Approved Methods require that an averaging time of one hour be used. This makes sense given that one hour is usually the shortest time spacing available for the meteorological data needed for modelling.

However, the modelling of odour faces a serious limitation in that human noses generally detect odour over a period of approximately one second or less. The comparatively long one hour model averaging time means that the peak odour concentrations of modelled plumes at levels that would cause annoyance would effectively be averaged during modelling to a point of being non-offensive. This makes a source seem less of a nuisance odour-wise, than it actually might be.

To compensate for this and allow more realistic predictions of odour impacts, peak-to-mean ratios, which relate long-term modelled averages to the short-term averages that would better approximate peak concentrations, are applied to odour emission rates.

Peak-to-mean ratios are dependent on the distance of the receptor to the source, the stability of weather during the transport of the odour through the air, the type of source, and length of the averaging time used in the model.

NSW EPA-recommended factors developed by Katestone Scientific are shown in **Table 5-9** reproduced from Section 6.6 of the NSW EPA Approved Methods.

The ratios for a wake-affected point were applied to the odour emission sources.

Table 5-9: Peak to Mean Ratio for Estimating Peak Odour Concentrations

Source Type	Pasquill-Gifford Stability Class	Near-field P/M60*	Far-field P/M60*
Area	A, B, C, D	2.5	2.3
	E, F	2.3	1.9
Line	A – F	6	6
Surface wake-free point	A, B, C	12	4
	D, E, F	25	7
Tall wake-free point	A, B, C	17	3
	D, E, F	35	6
Wake-affected point	A – F	2.3	2.3
Volume	A – F	2.3	2.3

Note: * Ratio of peak 1-second average concentrations to mean 1-hour average concentrations.
Source: NSW EPA Approved Methods, Section 6.6.

4.1.4 Scenarios and Assumptions

AERMOD Settings & Parameters

- Meteorological .SFC and .PFL files provided by the client based on Horsley Park 2015 data. Non-sequential Met Data option used.
- Model domain 3km x 3km from subject site centre coordinates
- Terrain SRTM 30m resolution
- Surface Station Primary Met Tower not specified so the Horsley Park AWS base elevation of 100 MLS was used.
- 99th Percentile impacts reported for 1 hour averaging periods for odour.
- Emissions from water tanks modelled 24/7. Emissions from all other sources modelled over site operational time Monday-Saturday 7am-7pm.
- Uniform Cartesian receptor grid spacing 50m x 50m over domain.

Modelling Inputs

Calculations are based on the result of the odour olfactometry analysis conducted by Odour Research Laboratories Australia (Stephenson Environmental).

The following assumptions were made:

- The standing water level in the water tank remains at 1.64m constantly and therefore do not need to adjust OU for the volume of air above the liquid,

- The volume of waste for a broken bag remains at 1.1m^3 and therefore do not need to adjust OU for the varying volume 'spills',
- The volume of processed waste is as was present during sampling including other non-processed domestic and office garbage, and therefore do not need to adjust OU for the varying volumes of waste types on site at any given time,
- Air sampled from the water tank is representative of the steam that would be released from the emergency pressure valve however is adjusted as steam will be released for a maximum of 5 minutes in an emergency whilst the steam released during the full cycle of operation is for a full hour,
- All emission rates peak to mean correction of 2.3 as per the AMMAAP for volume source and wake-affected point sources.

4.1.4.1 Odour Source Inventory

Details of the source inputs are given in **Table 4-4**.

Table 4-4: Source Input Details

Source	Water Tank Vent 1 No Reduction	Water Tank Vent 1 50% Reduction	Water Tank Vent 1 90% Reduction
Eastings	303936	303936	303936
Northings	6259024	6259024	6259024
Type	Point	Point	Point
Release Height	2.45 m	2.45 m	2.45 m
Stack Diameter	0.1 m	0.1 m	0.1 m
Discharge Temperature	40^{0}C	40^{0}C	40^{0}C
Exit Velocity	0.1 m/s	0.1 m/s	0.1 m/s
Emission Rate	14.81 OU/s	7.41 OU/s	1.48 OU/s

Source	Water Tank Vent 2 No Reduction	Water Tank Vent 2 50% Reduction	Water Tank Vent 2 90% Reduction
Eastings	303937	303937	303937
Northings	6259024	6259024	6259024
Type	Point	Point	Point
Release Height	2.45 m	2.45 m	2.45 m
Stack Diameter	0.1 m	0.1 m	0.1 m
Discharge Temperature	40^{0}C	40^{0}C	40^{0}C
Exit Velocity	0.1 m/s	0.1 m/s	0.1 m/s
Emission Rate	14.81 OU/s	7.41 OU/s	1.48 OU/s

Source	Processed Waste 2 Air Changes/Hour	Processed Waste 1 Air Change/Hour
Eastings	303931	303931
Northings	6259039	6259039
Type	Volume	Volume
Release Height	2.5 m	2.5 m
Length of Side	22.3 m	22.3 m
Initial Lateral Dimension	5.19 m	5.19 m

Initial Vertical Dimension	1.25 m	1.25 m
Emission Rate	6696.26 OU/s	3348.13OU/s

Source	Broken Bag 2 Air Changes/Hour	Broken Bag 1 Air Change/Hour
Eastings	303931	303931
Nothings	6259039	6259039
Type	Volume	Volume
Release Height	2.5 m	2.5 m
Length of Side	22.3 m	22.3 m
Initial Lateral Dimension	5.19 m	5.19 m
Initial Vertical Dimension	1.25 m	1.25 m
Emission Rate	4017.76 OU/s	2008.88 OU/s

Source	Emergency Release Valve
Eastings	303919
Northings	6259036
Type	Point
Release Height	7.5 m
Stack Diameter	0.05
Discharge Temperature	143^0C
Exit Velocity	93.7 m/s
Emission Rate	289.44 OU/s

4.1.5 Scenarios and Modelling Results

Seven (7) scenarios were considered and modelled to ensure that all possible operating conditions are included in the computer modelling predictions. **Table 4-5** includes the scenarios and results of the modelling for all scenarios.

Despite the fact that no mechanical ventilation is installed on site, the high building roof and the small number of employees, only one (1) air change per hour is more than sufficient. Based on our observations during the site inspections, we believe that less than 1 air change per hour is satisfactory. However, to get a better sensitivity analysis, we have assumed that there are two (2) air changes per hour for all scenarios except scenario 7. Scenario 7 is a more realistic worst case scenario.

Again, we have included scenarios 5 with 2 air changes and 50 % reduction of odour emissions at the water tank as a result of introducing an odour mitigation measure with 50% efficiency. Scenario 6 included 2 air changes per hour and an odour mitigation measure with 90% efficiency. This reduction is based on the manufacturers' specifications and many years of testing by the manufacturer.

The following tables summarise the results of the modelling for odour. Each table includes the result of each scenario modelled. Relevant isopleths modelling contours have been provided separately in **Attachment 3**.

Table 4-5: Scenarios and results

Scenario 1 considered normal operations without any incidents or near misses.

Scenario 1: Typical Operations (water tank and processed waste)

Receptor	Impact (OU)	AMMAAP Criteria (OU)
R1	0.021	2
R2	0.053	
R3	0.070	
R4	0.091	
R5	0.028	
R6	0.014	
R7	0.004	
R8	0.004	
R9	0.014	
R10	1.216	6
R11	5.158	
R12	1.693	
R13	3.102	
R14	2.483	
R15	6.610	

Scenario 2 considered normal operations with the addition of a possible bag fallen off during its transport from the collection bin to the storage bin. The bag was assumed to be open with higher odour emissions. We understand that this scenario has never occurred in the last three (3) years of operations and is unlikely to occur. We also considered necessary to model this scenario for another reason which is again unlikely to occur but we wanted to cover all possible scenarios. The other reason is that at hospitals, medical centres, etc.… there a very small chance that a bag is not fully sealed or tied properly. This is likely to generate additional odours.

Scenario 2: Typical operations + Broken Bag

Receptor	Impact (OU)	AMMAAP Criteria (OU)
R1	0.035	2
R2	0.084	
R3	0.112	
R4	0.0145	
R5	0.045	
R6	0.023	
R7	0.007	
R8	0.006	
R9	0.022	
R10	1.943	6
R11	8.252	
R12	2.707	
R13	4.940	
R14	3.955	
R15	10.575	

Scenario 3 considered normal operations at the facility and the emergency relief pressure valve opened due to increase in pressure above 50 PSI inside the autoclave. The steam was released into the atmosphere for 5 minutes until the system was shut down and the pressure was restored to normal.

Scenario 3: Typical operations + Emergency Pressure Valve Release

Receptor	Impact (OU)	AMMAAP Criteria (OU)
R1	0.023	2
R2	0.055	
R3	0.073	
R4	0.095	
R5	0.029	
R6	0.015	
R7	0.004	
R8	0.004	
R9	0.014	
R10	1.238	6
R11	5.216	
R12	1.778	
R13	3.217	
R14	2.572	
R15	6.600	

Scenario 4 considered worst case whereby the facility was operating normally but a bag was found open and the emergency relief pressure valve opened and released the steam for 5 minutes.

Scenario 4: Worst Case (All Potential Sources)

Receptor	Impact (OU)	AMMAAP Criteria (OU)
R1	0.0355	2
R2	0.086	
R3	0.115	
R4	0.149	
R5	0.046	
R6	0.023	
R7	0.007	
R8	0.006	
R9	0.023	
R10	1.952	6
R11	8.300	
R12	2.766	
R13	5.065	
R14	4.043	
R15	10.622	

Scenario 5 considered worst case whereby the facility was operating normally but a bag was found open and the emergency relief pressure valve opened and released the steam for 5

minutes. In addition, an odour mitigation measure was installed at the water tank to reduce odour emissions for that source by 50%.

Scenario 5: Worst Case (All Potential Sources) with 50% reduction of emissions from water tank

Receptor	Impact (OU)	AMMAAP Criteria (OU)
R1	0.035	2
R2	0.086	
R3	0.115	
R4	0.148	
R5	0.046	
R6	0.023	
R7	0.007	
R8	0.006	
R9	0.023	
R10	1.951	6
R11	8.300	
R12	2.759	
R13	5.049	
R14	4.026	
R15	10.614	

Scenario 6 considered worst case whereby the facility was operating normally but a bag was found open and the emergency relief pressure valve opened and released the steam for 5 minutes. In addition, an odour mitigation measure was installed at the water tank to reduce odour emissions for that source by 90%.

Scenario 6: Worst Case (All Potential Sources) with 90% reduction of emissions from water tank

Receptor	Impact (OU)	AMMAAP Criteria (OU)
R1	0.035	2
R2	0.086	
R3	0.115	
R4	0.148	
R5	0.046	
R6	0.023	
R7	0.007	
R8	0.006	
R9	0.023	
R10	1.944	6
R11	8.300	
R12	2.759	
R13	5.041	
R14	4.019	
R15	10.591	

Scenario 7 considered worst case whereby the facility was operating normally but a bag was found open and the emergency relief pressure valve opened and released the steam for 5

minutes. In addition, no odour mitigation measure was installed at the water tank to reduce odour emissions. For this scenario, we considered the most realistic worst case scenario which includes one (1) air change per hour from the building as stated above.

Scenario 7: Worst Case (All Potential Sources) assuming 1 air change

Receptor	Impact (OU)	AMMAAP Criteria (OU)
R1	0.018	2
R2	0.044	
R3	0.059	
R4	0.077	
R5	0.024	
R6	0.012	
R7	0.004	
R8	0.003	
R9	0.012	
R10	1.000	6
R11	4.219	
R12	1.454	
R13	2.600	
R14	2.094	
R15	5.371	

Due to the fact that the AERMOD output file for scenarios 1, 2, 3 and 4 is over 200 pages, we considered that it is more appropriate to provide only extracts from the file in **Attachment 2**. Similarly for the AERMOD output file for scenarios 5, 6 and 7. A copy of the full output files could be provided upon request.

4.2 Discussion of Results and Summary of Odour Impact

As previously stated, most of the scenarios considered in this assessment are more than worst case scenarios for the following reasons:

1. All collected bags are fully sealed and when placed in the waste processing bin they are sealed within minutes with another extra heavy duty liner that is designed to withstand high temperatures without being affected. This process will prevent the generation of odours for more than 5-10 minutes. However, we assumed that the waste bags are left for an hour before they are covered and sealed, and assumed that the odour is emitted for a full hour rather than 5-10 minutes. This assumption provides an additional hourly odour emission of 6-12 times more than the normal operations,

2. The broken open bag was assumed to be left open for 1 full hour rather than a few minutes which is the time that it may take the employees to clean and collect the broken bag, and re-seal it. Again, under normal operating conditions, the hourly odour emission from this source would be at least 10-20 times less than our assumed values,

3. The processed waste bin had several bags of what we believe to be unprocessed domestic and office waste. This unprocessed waste would give at least 40-60 % rise to the odour emissions from that source.

Based on the very conservative approach adopted in this odour assessment in particular in relation to the assumptions associated with the different scenarios, the comments outlined below are provided.

Most scenarios were modelled to ensure that the authorities have a better understanding of the most dominant odour source with the greatest contribution to the overall results (and impacts) on human health and the environment.

Results confirmed that under normal operating conditions and worst case scenario, the facility would comply very easily with the odour assessment criteria of 2.0 OU at all residential receptors.

The results of all scenarios which are more realistic and reflect normal operating conditions even without any odour mitigation measures demonstrate that the activities comply with the EPA's criteria at the residential receptors.

The results of the above scenarios provide the operator with options in relation to the preferred odour controls installed and operated on site. Of particular interest is the importance of having one of the roller shutter doors closed at all times except for vehicle access in and out. This option will provide more favourable results at all commercial/industrial receptors and will reduce the highest odour values at these receptors to below 4OU. However, this option may not be a practical one since the building has only natural ventilation and closure of this door may reduce natural ventilation by 40-50%.

In addition, it is not as important as it was initially thought that the proposed odour elimination technology be installed at the water tank unit. This was clearly demonstrated in both scenario 5 for 50% odour reduction and scenario 6 for 90% odour reduction. Hence, the installation of such technology is optional rather than mandatory.

The contours of all modelling scenario results are included in **Attachment 3**.

Based on our extensive experience with similar assessments for similar activities and in the vicinity of the proposed site, we believe that the proposed activities' odour emissions will comply very easily with the NSW criteria and this was demonstrated by the computer modelling undertaken and presented in this report.

4.3 Recommendations

Despite the fact that odour emissions criteria of 2 OU are easily complied with all residential receptors, one (1) odour elimination technology system with at least 50%-90% odour reduction efficiency to be installed in the water tank to reduce odour emissions from this odour generating source. This system, if operated at only 50 % efficiency, it will assist in reducing slightly the odour emissions at all neighbouring commercial/industrial properties with further odour reductions at all

residential receptors. The recommended system details are included in **Attachment 5**. Based on the manufacturers' specifications, this system can provide up to 90% odour reductions, if operated efficiently. This is an optional rather than mandatory mitigation measure.

It is recommended that the company refrain from disposing of unprocessed domestic and office waste into the processed waste bin to reduce odour generation further since this odour emission points had a great contribution to the overall odour emissions.

It is also recommended that the water stored in the water tank as part of the odour mitigation measures be replaced on a regular basis at least every six months to ensure that water is not saturated with odour which is re-emitted into the atmosphere through the two small openings. This measure is not of a great impact on the overall odour emissions but it would have a contribution to the reduction of odour emissions from the site into the surrounding environment. Again, this is not a mandatory but rather optional measure that the proponent may wish to consider.

5. STATEMENT OF POTENTIAL AIR IMPACTS

Given consideration of the activities undertaken on site, it is concluded that odour emissions from the subject site are highly unlikely due to the fact that all waste materials are contained within double bags which are in turns contained within a sealed extra heavy duty bag (Liner) inside the waste processing bin. None of the activities conducted on site are likely to generate any offensive odour at any stage of the process since the whole process has the waste materials fully sealed at all times in addition to the fact that all activities are undertaken within the building.

The NSW EPA guidelines "*Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales"*, "*Technical framework - Assessment and management of odour from stationary sources in NSW"* and "*Technical notes - Assessment and management of odour from stationary sources in NSW*" were utilised for the preparation of this Air Quality Impact Assessment report. This assessment has adopted the respective methodologies from these guidelines, including the selection of meteorological data, the collection of appropriate odour emissions data from real time activities during all stages of the process, calculations of odour emission rates, and the set-up of the AERMOD dispersion model to accurately simulate the emissions from the subject site.

The assessment has been prepared to assess the odour impacts of the proposed waste management facility on the neighbouring industrial properties and the nearest potentially affected residential receptors. A discussion of the outcomes from the modelling conducted and comparison with the relevant criteria have been established. Outcomes have led to a conclusion that odour emissions comply very easily with current EPA criteria at all potentially affected residential receptors without the need for any further odour mitigation measures. Odour mitigation measures are only optional rather than mandatory to ensure compliance with current EPA criteria at the adjacent industrial/commercial properties for the life of the development. These mitigation measures include an odour elimination technology installed at the water tank unit to ensure that odour nuisance is not caused at the nearest affected neighbouring industrial/commercial properties. In addition, other optional odour mitigation measures are also recommended to ensure that the facility will comply with EPA's odour emission criteria under any operating and weather conditions. The implementation of the above measures should provide all stakeholders including Government Authorities, community and the operator the confidence that the facility will operate with nil odour-related complaints.

6. LIMITATIONS

Our services for this Air Quality Impact Assessment (AQIA) are carried out in accordance with our current professional standards for the preparation of similar assessments. No guarantees are either expressed or implied.

This AQIA has been prepared solely for the use of Stimson & Baker Planning and State Waste Services (NSW) Pty Ltd, as per our agreement for providing environmental services. Only Stimson & Baker Planning and State Waste Services (NSW) Pty Ltd are entitled to rely upon the information provided in this AQIA within the scope of work described in this AQIA. Otherwise, no responsibility is accepted for the use of any part of the AQIA by another in any other context or for any other purpose.

Although all due care has been taken in the preparation of this AQIA, no warranty is given, nor liability accepted (except what otherwise is required by law) in relation to any of the information contained within this document. We accept no responsibility for the accuracy of any data or information provided to us by Stimson & Baker Planning and State Waste Services (NSW) Pty Ltd for the purposes of preparing this AQIA.

Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.

7. REFERENCES

1. Protection of the Environment Operations Act 1997

2. Protection of the Environment Operations (General) Regulation 2009

3. Protection of the Environment Operations (Waste) Regulation 2014

4. NSW DEC (EPA) Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales – August 2005

5. NSW DEC (EPA) Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales – January 2007

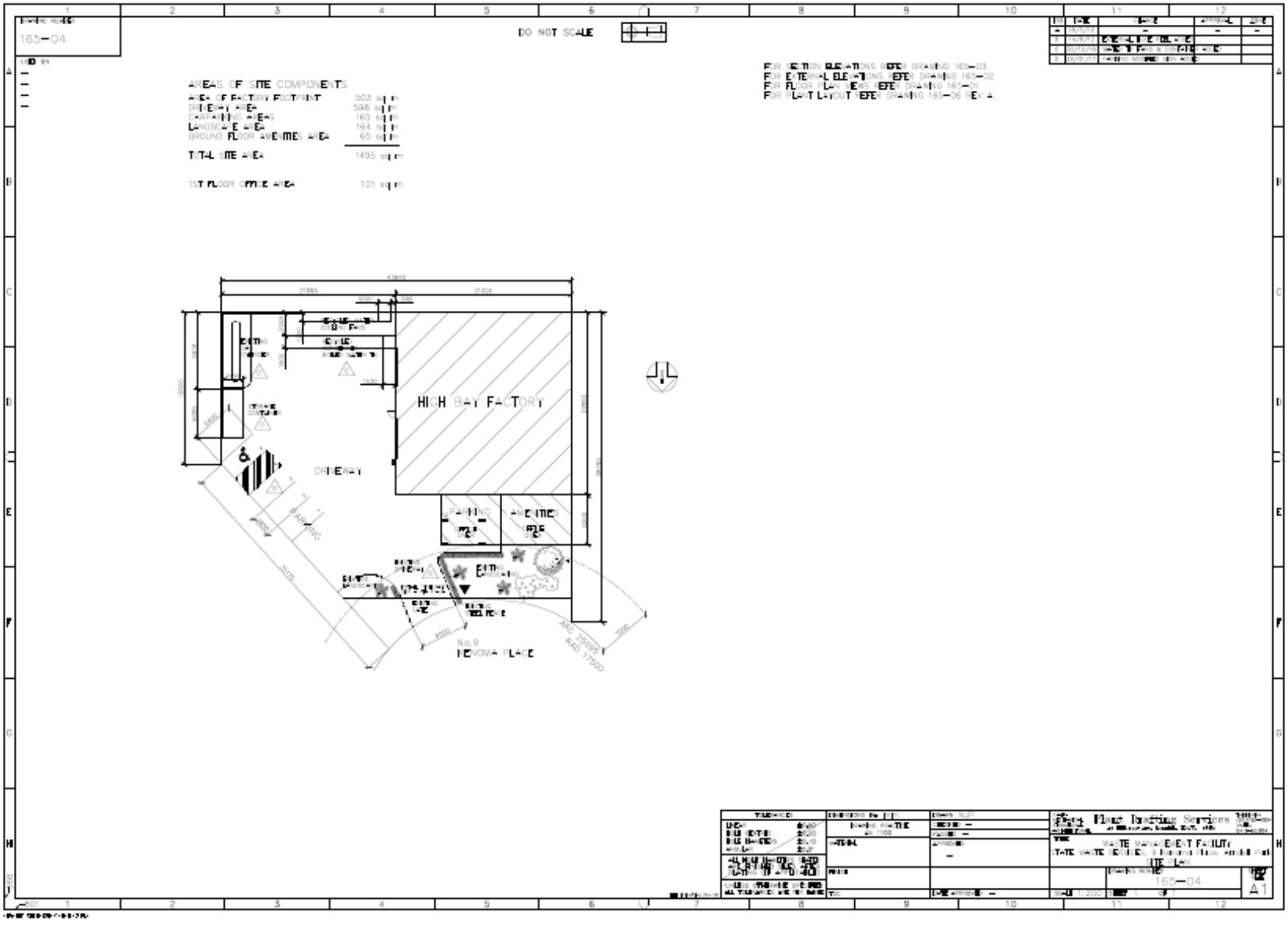
6. NSW DEC (EPA) Technical framework: Assessment and Management of Odour from Stationary Sources in NSW – November 2006

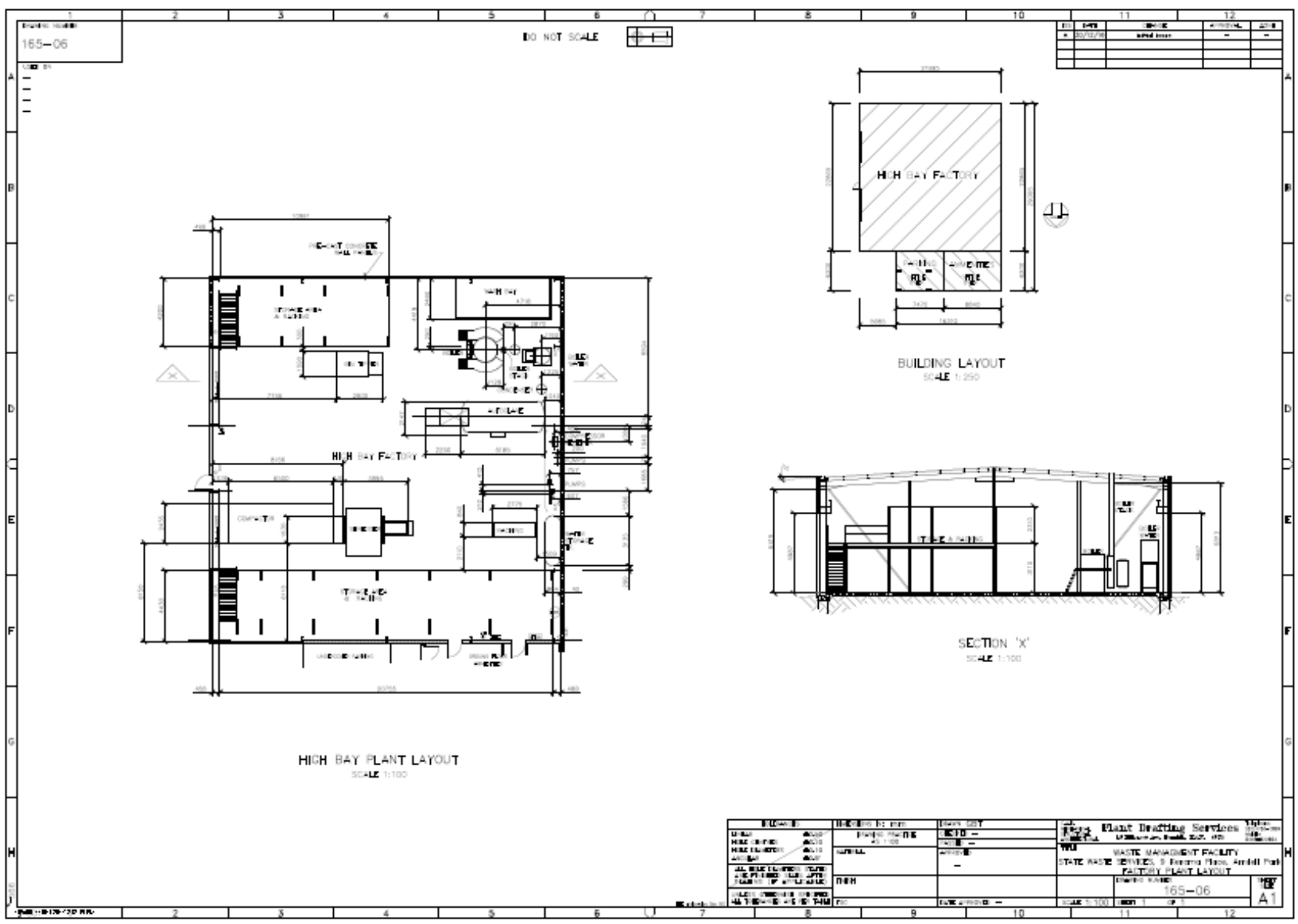
7. NSW DEC (EPA) Technical Notes: Assessment and Management of Odour from Stationary Sources in NSW – November 2006

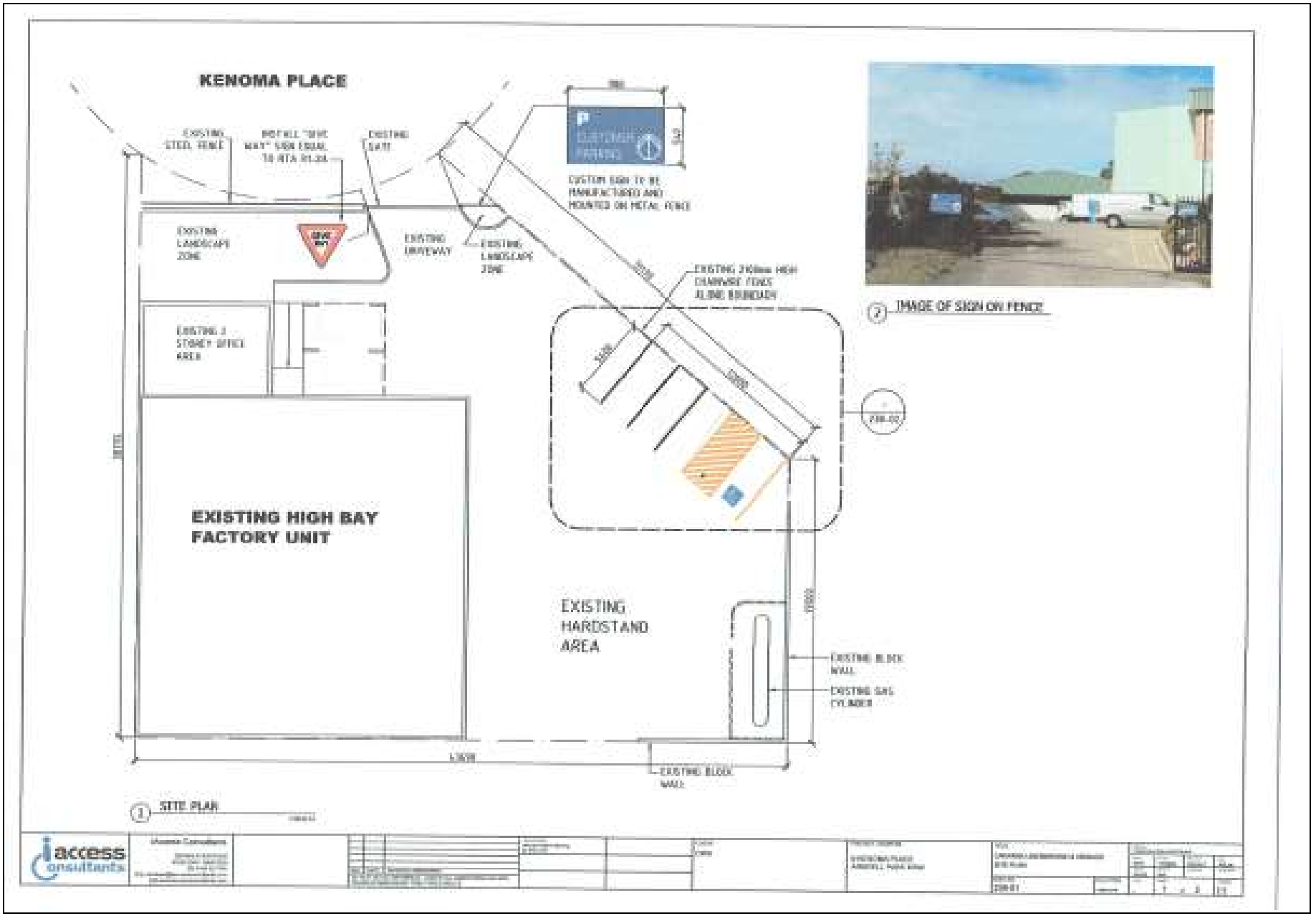
8. Ormerod R.J., D'Abreton P.C. Holmes G., "Buoyancy Effects Associated with Non-Point Odour Sources: Modelling Issues and Implications" – 2003

ATTACHMENTS

Attachment 1: Site Layout and Locations of Receptors


DO NOT SCALE
AREAS OF SITE COMPONENTS
HIGH BAY FACTORY
DRIVEWAY
No.9
HENKMA PLACE


DO NOT SCALE
165–06
HIGH BAY FACTORY
BUILDING LAYOUT
SCALE 1:250
HIGH BAY FACTORY
HIGH BAY PLANT LAYOUT
SCALE 1:100
SECTION 'X'
SCALE 1:100
Plant Drafting Services
WASTE MANAGEMENT FACILITY
STATE WASTE SERVICES, 9 Ranamo Place, Arndell Park
FACTORY PLANT LAYOUT
165–06
A1


KENOMA PLACE
EXISTING STEEL FENCE
EXISTING GATE
EXISTING LANDSCAPE ZONE
EXISTING DRIVEWAY
EXISTING LANDSCAPE ZONE
CUSTOM SIGN TO BE MANUFACTURED AND MOUNTED ON METAL FENCE
EXISTING 2400mm HIGH CHAINWIRE FENCE ALONG BOUNDARY
EXISTING 2 STOREY OFFICE AREA
EXISTING HIGH BAY FACTORY UNIT
EXISTING HARDSTAND AREA
EXISTING BLOCK WALL
EXISTING GAS CYLINDER
EXISTING BLOCK WALL
1 SITE PLAN
2 IMAGE OF SIGN ON FENCE

Closest Potentially Sensitive Residential Receptors

Closest Neighbouring Commercial/Industrial Receptors

Attachment 2: Sample AERMOD Output Files – Odour Impact Modelling

```
**************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 9.2.0
** Lakes Environmental Software Inc.
** Date: 9/01/2017
** File: T:\JOBS - ACTIVE\161211 - Nicolas Israel Pharmaceutical
Waste\Job\Technical\161211 air\161211 air.ADI
**
**************************************
**
**
**************************************
** AERMOD Control Pathway
**************************************
**
**
CO STARTING
  TITLEONE T:\JOBS - ACTIVE\161211 - Nicolas Israel Pharmaceutical Waste\Job\Te
  MODELOPT DFAULT CONC WARNCHKD
  AVERTIME 1
  POLLUTID OTHER
  RUNORNOT RUN
  ERRORFIL "161211 air.err"
CO FINISHED
**
**************************************
** AERMOD Source Pathway
**************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
  LOCATION PRESSUREV    POINT      303918.790  6259035.780       59.340
  LOCATION WATERTANK1   POINT      303935.620  6259024.300       59.530
  LOCATION WATERTANK2   POINT      303936.578  6259024.192       59.500
  LOCATION BROKENBAG    VOLUME     303931.470  6259038.960       58.690
  LOCATION PROCESSEDW   VOLUME     303931.470  6259038.960       58.690
** Source Parameters **
  SRCPARAM PRESSUREV       289.44     7.500   416.150  93.70000     0.050
  SRCPARAM WATERTANK1       15.0      2.450   313.150   0.10000     0.100
  SRCPARAM WATERTANK2       15.0      2.450   313.150   0.10000     0.100
  SRCPARAM BROKENBAG      4017.76     2.500     5.186     1.250
  SRCPARAM PROCESSEDW      6696.26     2.500     5.186     1.250

** Building Downwash **
  BUILDHGT PRESSUREV       6.00     6.00     6.00     6.00     6.00     6.00
  BUILDHGT PRESSUREV       6.00     6.00     6.00     6.00     6.00     6.00
  BUILDHGT PRESSUREV       6.00     6.00     6.00     6.00     6.00     6.00
  BUILDHGT PRESSUREV       6.00     6.00     6.00     6.00     6.00     6.00
  BUILDHGT PRESSUREV       6.00     6.00     6.00     6.00     6.00     6.00
  BUILDHGT PRESSUREV       6.00     6.00     6.00     6.00     6.00     6.00

  BUILDHGT WATERTANK1      6.00     6.00     6.00     6.00     6.00     6.00
  BUILDHGT WATERTANK1      6.00     6.00     6.00     6.00     6.00     6.00
  BUILDHGT WATERTANK1      6.00     6.00     6.00     6.00     6.00     6.00
  BUILDHGT WATERTANK1      6.00     6.00     6.00     6.00     6.00     6.00
  BUILDHGT WATERTANK1      6.00     6.00     6.00     6.00     6.00     6.00
```

```
BUILDHGT WATERTANK1      6.00    6.00    6.00    6.00    6.00    6.00

BUILDHGT WATERTANK2      6.00    6.00    6.00    6.00    6.00    6.00
BUILDHGT WATERTANK2      6.00    6.00    6.00    6.00    6.00    6.00
BUILDHGT WATERTANK2      6.00    6.00    6.00    6.00    6.00    6.00
BUILDHGT WATERTANK2      6.00    6.00    6.00    6.00    6.00    6.00
BUILDHGT WATERTANK2      6.00    6.00    6.00    6.00    6.00    6.00
BUILDHGT WATERTANK2      6.00    6.00    6.00    6.00    6.00    6.00

BUILDWID PRESSUREV      98.13  101.83  102.44   99.93   94.39   85.98
BUILDWID PRESSUREV      74.95   61.65   46.48   81.86   73.19   49.40
BUILDWID PRESSUREV      63.44   75.55   85.37   92.60   97.01   98.47
BUILDWID PRESSUREV      98.13  101.83  102.44   99.93   94.39   85.98
BUILDWID PRESSUREV      74.95   61.65   46.48   81.86   73.19   49.40
BUILDWID PRESSUREV      63.44   75.55   85.37   92.60   97.01   98.47

BUILDWID WATERTANK1      98.13  101.83  102.44   99.93   94.39   85.98
BUILDWID WATERTANK1      74.95   61.65   46.48   81.86   35.45   49.40
BUILDWID WATERTANK1      63.44   75.55   85.37   92.60   97.01   98.47
BUILDWID WATERTANK1      98.13  101.83  102.44   99.93   94.39   85.98
BUILDWID WATERTANK1      74.95   61.65   46.48   81.86   35.45   49.40
BUILDWID WATERTANK1      63.44   75.55   85.37   92.60   97.01   98.47

BUILDWID WATERTANK2      98.13  101.83  102.44   99.93   94.39   85.98
BUILDWID WATERTANK2      74.95   61.65   46.48   81.86   35.45   49.40
BUILDWID WATERTANK2      63.44   75.55   85.37   92.60   97.01   98.47
BUILDWID WATERTANK2      98.13  101.83  102.44   99.93   94.39   85.98
BUILDWID WATERTANK2      74.95   61.65   46.48   81.86   35.45   49.40
BUILDWID WATERTANK2      63.44   75.55   85.37   92.60   97.01   98.47

BUILDLEN PRESSUREV      30.91   35.45   49.40   63.44   75.55   85.37
BUILDLEN PRESSUREV      92.60   97.01   98.47   99.88  112.30  102.44
BUILDLEN PRESSUREV      99.93   94.39   85.98   74.95   61.65   46.48
BUILDLEN PRESSUREV      30.91   35.45   49.40   63.44   75.55   85.37
BUILDLEN PRESSUREV      92.60   97.01   98.47   99.88  112.30  102.44
BUILDLEN PRESSUREV      99.93   94.39   85.98   74.95   61.65   46.48

BUILDLEN WATERTANK1      30.91   35.45   49.40   63.44   75.55   85.37
BUILDLEN WATERTANK1      92.60   97.01   98.47   99.88  101.83  102.44
BUILDLEN WATERTANK1      99.93   94.39   85.98   74.95   61.65   46.48
BUILDLEN WATERTANK1      30.91   35.45   49.40   63.44   75.55   85.37
BUILDLEN WATERTANK1      92.60   97.01   98.47   99.88  101.83  102.44
BUILDLEN WATERTANK1      99.93   94.39   85.98   74.95   61.65   46.48

BUILDLEN WATERTANK2      30.91   35.45   49.40   63.44   75.55   85.37
BUILDLEN WATERTANK2      92.60   97.01   98.47   99.88  101.83  102.44
BUILDLEN WATERTANK2      99.93   94.39   85.98   74.95   61.65   46.48
BUILDLEN WATERTANK2      30.91   35.45   49.40   63.44   75.55   85.37
BUILDLEN WATERTANK2      92.60   97.01   98.47   99.88  101.83  102.44
BUILDLEN WATERTANK2      99.93   94.39   85.98   74.95   61.65   46.48

XBADJ   PRESSUREV     -42.32  -38.68  -44.36  -50.27  -54.66  -57.39
XBADJ   PRESSUREV     -58.37  -57.58  -55.04  -52.90  -58.83  -44.09
XBADJ   PRESSUREV     -38.49  -31.71  -23.98  -15.51   -6.58    2.56
XBADJ   PRESSUREV      11.42    3.24   -5.04  -13.17  -20.90  -27.99
XBADJ   PRESSUREV     -34.23  -39.43  -43.43  -46.98  -53.48  -58.35
XBADJ   PRESSUREV     -61.44  -62.67  -62.00  -59.44  -55.08  -49.04

XBADJ   WATERTANK1    -33.94  -33.65  -42.83  -52.29  -60.17  -66.22
```

```
  XBADJ   WATERTANK1   -70.26  -72.16  -71.87  -71.47  -68.10  -64.41
  XBADJ   WATERTANK1   -58.76  -51.33  -42.33  -32.06  -20.80   -8.92
  XBADJ   WATERTANK1     3.03   -1.80   -6.57  -11.15  -15.38  -19.15
  XBADJ   WATERTANK1   -22.34  -24.85  -26.60  -28.41  -33.74  -38.03
  XBADJ   WATERTANK1   -41.17  -43.06  -43.64  -42.90  -40.85  -37.56

  XBADJ   WATERTANK2   -34.00  -33.88  -43.21  -52.83  -60.84  -67.00
  XBADJ   WATERTANK2   -71.12  -73.09  -72.83  -72.43  -69.04  -65.29
  XBADJ   WATERTANK2   -59.57  -52.03  -42.91  -32.49  -21.08   -9.03
  XBADJ   WATERTANK2     3.09   -1.57   -6.19  -10.61  -14.72  -18.37
  XBADJ   WATERTANK2   -21.47  -23.92  -25.64  -27.45  -32.80  -37.15
  XBADJ   WATERTANK2   -40.37  -42.36  -43.07  -42.47  -40.57  -37.45

  YBADJ   PRESSUREV     2.08   -2.56   -7.13  -11.48  -15.48  -19.01
  YBADJ   PRESSUREV   -21.96  -24.25  -25.80   -1.39   -2.09  -19.66
  YBADJ   PRESSUREV   -18.55  -16.88  -14.70  -12.07   -9.08   -5.80
  YBADJ   PRESSUREV    -2.08    2.56    7.13   11.48   15.48   19.01
  YBADJ   PRESSUREV    21.96   24.25   25.80    1.39    2.09   19.66
  YBADJ   PRESSUREV    18.55   16.88   14.70   12.07    9.08    5.80

  YBADJ   WATERTANK1   20.65   17.18   13.19    8.79    4.13   -0.65
  YBADJ   WATERTANK1   -5.42  -10.02  -14.32    6.99  -15.93  -18.13
  YBADJ   WATERTANK1   -20.57  -22.39  -23.53  -23.96  -23.66  -22.63
  YBADJ   WATERTANK1   -20.65  -17.18  -13.19   -8.79   -4.13    0.65
  YBADJ   WATERTANK1    5.42   10.02   14.32   -6.99   15.93   18.13
  YBADJ   WATERTANK1    20.57   22.39   23.53   23.96   23.66   22.63

  YBADJ   WATERTANK2   21.62   18.12   14.07    9.60    4.83   -0.08
  YBADJ   WATERTANK2   -4.99   -9.75  -14.21    6.93  -16.15  -18.51
  YBADJ   WATERTANK2   -21.11  -23.06  -24.31  -24.82  -24.58  -23.59
  YBADJ   WATERTANK2   -21.62  -18.12  -14.07   -9.60   -4.83    0.08
  YBADJ   WATERTANK2    4.99    9.75   14.21   -6.93   16.15   18.51
  YBADJ   WATERTANK2    21.11   23.06   24.31   24.82   24.58   23.59


** Variable Emissions Type: "By Hour / Day (HRDOW)"
** Variable Emission Scenario: "Scenario 2"
** WeekDays:
  EMISFACT BROKENBAG   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
  EMISFACT BROKENBAG   HRDOW 1.0 1.0 1.0 1.0 1.0 1.0
  EMISFACT BROKENBAG   HRDOW 1.0 1.0 1.0 1.0 1.0 1.0
  EMISFACT BROKENBAG   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
** Saturday:
  EMISFACT BROKENBAG   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
  EMISFACT BROKENBAG   HRDOW 1.0 1.0 1.0 1.0 1.0 1.0
  EMISFACT BROKENBAG   HRDOW 1.0 1.0 1.0 1.0 1.0 1.0
  EMISFACT BROKENBAG   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
** Sunday:
  EMISFACT BROKENBAG   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
  EMISFACT BROKENBAG   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
  EMISFACT BROKENBAG   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
  EMISFACT BROKENBAG   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
** WeekDays:
  EMISFACT PRESSUREV   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
  EMISFACT PRESSUREV   HRDOW 1.0 1.0 1.0 1.0 1.0 1.0
  EMISFACT PRESSUREV   HRDOW 1.0 1.0 1.0 1.0 1.0 1.0
  EMISFACT PRESSUREV   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
** Saturday:
  EMISFACT PRESSUREV   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
```

```
   EMISFACT PRESSUREV    HRDOW 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PRESSUREV    HRDOW 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PRESSUREV    HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
** Sunday:
   EMISFACT PRESSUREV    HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PRESSUREV    HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PRESSUREV    HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PRESSUREV    HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
** WeekDays:
   EMISFACT PROCESSEDW   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PROCESSEDW   HRDOW 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PROCESSEDW   HRDOW 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PROCESSEDW   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
** Saturday:
   EMISFACT PROCESSEDW   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PROCESSEDW   HRDOW 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PROCESSEDW   HRDOW 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PROCESSEDW   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
** Sunday:
   EMISFACT PROCESSEDW   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PROCESSEDW   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PROCESSEDW   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PROCESSEDW   HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   CONCUNIT 1 OU/S OU/M**3
   SRCGROUP Typical  PROCESSEDW WATERTANK1 WATERTANK2
   SRCGROUP BrokenBa BROKENBAG PROCESSEDW WATERTANK1 WATERTANK2
   SRCGROUP Pressure PRESSUREV PROCESSEDW WATERTANK1 WATERTANK2
   SRCGROUP WorstCas PRESSUREV WATERTANK1 WATERTANK2 BROKENBAG
PROCESSEDW
   SRCGROUP ALL
SO FINISHED
**
**********************************************
** AERMOD Receptor Pathway
**********************************************
**
**
RE STARTING
   INCLUDED "161211 air.rou"
RE FINISHED
**
**********************************************
** AERMOD Meteorology Pathway
**********************************************
**
**
ME STARTING
   SURFFILE ..\ArndellPark2015.SFC
   PROFFILE ..\ArndellPark2015.PFL
   SURFDATA 11 2015
   UAIRDATA 99 2015
   SITEDATA 22 2015
   PROFBASE 100.0 METERS
ME FINISHED
**
**********************************************
** AERMOD Output Pathway
**********************************************
**
```

```
**
OU STARTING
  RECTABLE ALLAVE 1ST
  RECTABLE 1 1ST
** 1-Hour Binary POSTFILE for the Percentile/Rolling Average Option
  POSTFILE 1 ALL UNFORM "161211 air.AD\1HGALLUN.POS" 31
  POSTFILE 1 Typical UNFORM "161211 air.AD\1HG001UN.POS" 32
  POSTFILE 1 BrokenBa UNFORM "161211 air.AD\1HG002UN.POS" 33
  POSTFILE 1 Pressure UNFORM "161211 air.AD\1HG003UN.POS" 34
  POSTFILE 1 WorstCas UNFORM "161211 air.AD\1HG004UN.POS" 35
** Auto-Generated Plotfiles
  PLOTFILE 1 ALL 1ST "161211 air.AD\01H1GALL.PLT" 36
  PLOTFILE 1 Typical 1ST "161211 air.AD\01H1G001.PLT" 37
  PLOTFILE 1 BrokenBa 1ST "161211 air.AD\01H1G002.PLT" 38
  PLOTFILE 1 Pressure 1ST "161211 air.AD\01H1G003.PLT" 39
  PLOTFILE 1 WorstCas 1ST "161211 air.AD\01H1G004.PLT" 40
  SUMMFILE "161211 air.sum"
OU FINISHED

 *** Message Summary For AERMOD Model Setup ***

 --------- Summary of Total Messages --------

A Total of          0 Fatal Error Message(s)
A Total of          2 Warning Message(s)
A Total of          0 Informational Message(s)


   ******** FATAL ERROR MESSAGES ********
            ***  NONE  ***


   ********   WARNING MESSAGES   ********
SO W320      41       PPARM: Input Parameter May Be Out-of-Range for Parameter          VS
ME W396      230          MEOPEN: AERMET Version Out-dated or Non-standard; Version:
12345

 ***********************************
 *** SETUP Finishes Successfully ***
 ***********************************

 *** AERMOD - VERSION   15181 ***     *** T:\JOBS - ACTIVE\161211 - Nicolas Israel
Pharmaceutical Waste\Job\Te ***       01/09/17
 *** AERMET - VERSION  12345 ***   ***                                                ***
08:09:49
                                                                          PAGE   1
 **MODELOPTs:   RegDFAULT CONC      ELEV      WARNCHKD  RURAL

                              ***    MODEL SETUP OPTIONS SUMMARY      ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 **Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
 **Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
 **Model Uses NO WET DEPLETION.  WETDPLT  =  F
```

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.

**Other Options Specified:
WARNCHKD - Issues warning messages for records out of sequence
in meteorology files

**Model Assumes No FLAGPOLE Receptor Heights.

**The User Specified a Pollutant Type of: OTHER

**Model Calculates 1 Short Term Average(s) of: 1-HR

**This Run Includes: 5 Source(s); 5 Source Group(s); and 10015 Receptor(s)

with: 3 POINT(s), including
0 POINTCAP(s) and 0 POINTHOR(s)
and: 2 VOLUME source(s)
and: 0 AREA type source(s)
and: 0 LINE source(s)
and: 0 OPENPIT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 12345

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
Model Outputs External File(s) of Concurrent Values for Postprocessing (POSTFILE Keyword)
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 100.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = OU/S ; Emission Rate Unit Factor = 1.0000
Output Units = OU/M**3

**Approximate Storage Requirements of Model = 6.4 MB of RAM.

**Detailed Error/Message File: 161211 air.err
**File for Summary of Results: 161211 air.sum

*** AERMOD - VERSION 15181 *** *** T:\JOBS - ACTIVE\161211 - Nicolas Israel Pharmaceutical Waste\Job\Te *** 01/09/17
*** AERMET - VERSION 12345 *** *** *** 08:09:49

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (USER UNITS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BLDG EXISTS	URBAN SOURCE	CAP/ HOR VARY BY	EMIS RATE SCALAR
PRESSUREV	0	0.28944E+03	303918.8	6259035.8	59.3	7.50	416.15	93.70	0.05	YES	NO	NO	HRDOW
WATERTANK1	0	0.15000E+02	303935.6	6259024.3	59.5	2.45	313.15	0.10	0.10	YES	NO	NO	
WATERTANK2	0	0.15000E+02	303936.6	6259024.2	59.5	2.45	313.15	0.10	0.10	YES	NO	NO	

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (USER UNITS)	X (METERS)	Y (METERS)	ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
BROKENBAG	0	0.40178E+04	303931.5	6259039.0	58.7	2.50	5.19	1.25	NO	HRDOW
PROCESSEDW	0	0.66963E+04	303931.5	6259039.0	58.7	2.50	5.19	1.25	NO	HRDOW

*** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID	SOURCE IDs
TYPICAL	WATERTANK1 , WATERTANK2 , PROCESSEDW ,

BROKENBA WATERTANK1 , WATERTANK2 , BROKENBAG , PROCESSEDW ,

PRESSURE PRESSUREV , WATERTANK1 , WATERTANK2 , PROCESSEDW ,

WORSTCAS PRESSUREV , WATERTANK1 , WATERTANK2 , BROKENBAG , PROCESSEDW ,

ALL PRESSUREV , WATERTANK1 , WATERTANK2 , BROKENBAG , PROCESSEDW ,

*** AERMOD - VERSION 15181 *** *** T:\JOBS - ACTIVE\161211 - Nicolas Israel Pharmaceutical Waste\Job\Te *** 01/09/17
*** AERMET - VERSION 12345 *** *** *** 08:09:49

**MODELOPTs: RegDFAULT CONC ELEV WARNCHKD RURAL

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: PRESSUREV

IFV	BH	BW	BL	XADJ	YADJ	IFV	BH	BW	BL	XADJ	YADJ
1	6.0,	98.1,	30.9,	-42.3,	2.1,	2	6.0,	101.8,	35.4,	-38.7,	-2.6,
3	6.0,	102.4,	49.4,	-44.4,	-7.1,	4	6.0,	99.9,	63.4,	-50.3,	-11.5,
5	6.0,	94.4,	75.5,	-54.7,	-15.5,	6	6.0,	86.0,	85.4,	-57.4,	-19.0,
7	6.0,	75.0,	92.6,	-58.4,	-22.0,	8	6.0,	61.6,	97.0,	-57.6,	-24.2,
9	6.0,	46.5,	98.5,	-55.0,	-25.8,	10	6.0,	81.9,	99.9,	-52.9,	-1.4,
11	6.0,	73.2,	112.3,	-58.8,	-2.1,	12	6.0,	49.4,	102.4,	-44.1,	-19.7,
13	6.0,	63.4,	99.9,	-38.5,	-18.6,	14	6.0,	75.5,	94.4,	-31.7,	-16.9,
15	6.0,	85.4,	86.0,	-24.0,	-14.7,	16	6.0,	92.6,	75.0,	-15.5,	-12.1,
17	6.0,	97.0,	61.6,	-6.6,	-9.1,	18	6.0,	98.5,	46.5,	2.6,	-5.8,
19	6.0,	98.1,	30.9,	11.4,	-2.1,	20	6.0,	101.8,	35.4,	3.2,	2.6,
21	6.0,	102.4,	49.4,	-5.0,	7.1,	22	6.0,	99.9,	63.4,	-13.2,	11.5,
23	6.0,	94.4,	75.5,	-20.9,	15.5,	24	6.0,	86.0,	85.4,	-28.0,	19.0,
25	6.0,	75.0,	92.6,	-34.2,	22.0,	26	6.0,	61.6,	97.0,	-39.4,	24.2,
27	6.0,	46.5,	98.5,	-43.4,	25.8,	28	6.0,	81.9,	99.9,	-47.0,	1.4,
29	6.0,	73.2,	112.3,	-53.5,	2.1,	30	6.0,	49.4,	102.4,	-58.3,	19.7,
31	6.0,	63.4,	99.9,	-61.4,	18.6,	32	6.0,	75.5,	94.4,	-62.7,	16.9,
33	6.0,	85.4,	86.0,	-62.0,	14.7,	34	6.0,	92.6,	75.0,	-59.4,	12.1,
35	6.0,	97.0,	61.6,	-55.1,	9.1,	36	6.0,	98.5,	46.5,	-49.0,	5.8,

SOURCE ID: WATERTANK1

IFV	BH	BW	BL	XADJ	YADJ	IFV	BH	BW	BL	XADJ	YADJ
1	6.0,	98.1,	30.9,	-33.9,	20.7,	2	6.0,	101.8,	35.4,	-33.6,	17.2,
3	6.0,	102.4,	49.4,	-42.8,	13.2,	4	6.0,	99.9,	63.4,	-52.3,	8.8,
5	6.0,	94.4,	75.5,	-60.2,	4.1,	6	6.0,	86.0,	85.4,	-66.2,	-0.7,
7	6.0,	75.0,	92.6,	-70.3,	-5.4,	8	6.0,	61.6,	97.0,	-72.2,	-10.0,
9	6.0,	46.5,	98.5,	-71.9,	-14.3,	10	6.0,	81.9,	99.9,	-71.5,	7.0,
11	6.0,	35.4,	101.8,	-68.1,	-15.9,	12	6.0,	49.4,	102.4,	-64.4,	-18.1,
13	6.0,	63.4,	99.9,	-58.8,	-20.6,	14	6.0,	75.5,	94.4,	-51.3,	-22.4,
15	6.0,	85.4,	86.0,	-42.3,	-23.5,	16	6.0,	92.6,	75.0,	-32.1,	-24.0,
17	6.0,	97.0,	61.6,	-20.8,	-23.7,	18	6.0,	98.5,	46.5,	-8.9,	-22.6,
19	6.0,	98.1,	30.9,	3.0,	-20.7,	20	6.0,	101.8,	35.4,	-1.8,	-17.2,
21	6.0,	102.4,	49.4,	-6.6,	-13.2,	22	6.0,	99.9,	63.4,	-11.2,	-8.8,
23	6.0,	94.4,	75.5,	-15.4,	-4.1,	24	6.0,	86.0,	85.4,	-19.2,	0.7,
25	6.0,	75.0,	92.6,	-22.3,	5.4,	26	6.0,	61.6,	97.0,	-24.9,	10.0,
27	6.0,	46.5,	98.5,	-26.6,	14.3,	28	6.0,	81.9,	99.9,	-28.4,	-7.0,

```
  29   6.0,   35.4,  101.8,  -33.7,   15.9,     30   6.0,   49.4,  102.4,  -38.0,   18.1,
  31   6.0,   63.4,   99.9,  -41.2,   20.6,     32   6.0,   75.5,   94.4,  -43.1,   22.4,
  33   6.0,   85.4,   86.0,  -43.6,   23.5,     34   6.0,   92.6,   75.0,  -42.9,   24.0,
  35   6.0,   97.0,   61.6,  -40.8,   23.7,     36   6.0,   98.5,   46.5,  -37.6,   22.6,


 SOURCE ID: WATERTANK2
  IFV    BH      BW      BL     XADJ    YADJ     IFV    BH      BW      BL     XADJ    YADJ
   1   6.0,   98.1,   30.9,  -34.0,   21.6,      2   6.0,  101.8,   35.4,  -33.9,   18.1,
   3   6.0,  102.4,   49.4,  -43.2,   14.1,      4   6.0,   99.9,   63.4,  -52.8,    9.6,
   5   6.0,   94.4,   75.5,  -60.8,    4.8,      6   6.0,   86.0,   85.4,  -67.0,   -0.1,
   7   6.0,   75.0,   92.6,  -71.1,   -5.0,      8   6.0,   61.6,   97.0,  -73.1,   -9.8,
   9   6.0,   46.5,   98.5,  -72.8,  -14.2,     10   6.0,   81.9,   99.9,  -72.4,    6.9,
  11   6.0,   35.4,  101.8,  -69.0,  -16.2,     12   6.0,   49.4,  102.4,  -65.3,  -18.5,
  13   6.0,   63.4,   99.9,  -59.6,  -21.1,     14   6.0,   75.5,   94.4,  -52.0,  -23.1,
  15   6.0,   85.4,   86.0,  -42.9,  -24.3,     16   6.0,   92.6,   75.0,  -32.5,  -24.8,
  17   6.0,   97.0,   61.6,  -21.1,  -24.6,     18   6.0,   98.5,   46.5,   -9.0,  -23.6,
  19   6.0,   98.1,   30.9,    3.1,  -21.6,     20   6.0,  101.8,   35.4,   -1.6,  -18.1,
  21   6.0,  102.4,   49.4,   -6.2,  -14.1,     22   6.0,   99.9,   63.4,  -10.6,   -9.6,
  23   6.0,   94.4,   75.5,  -14.7,   -4.8,     24   6.0,   86.0,   85.4,  -18.4,    0.1,
  25   6.0,   75.0,   92.6,  -21.5,    5.0,     26   6.0,   61.6,   97.0,  -23.9,    9.8,
  27   6.0,   46.5,   98.5,  -25.6,   14.2,     28   6.0,   81.9,   99.9,  -27.4,   -6.9,
  29   6.0,   35.4,  101.8,  -32.8,   16.2,     30   6.0,   49.4,  102.4,  -37.1,   18.5,
  31   6.0,   63.4,   99.9,  -40.4,   21.1,     32   6.0,   75.5,   94.4,  -42.4,   23.1,
  33   6.0,   85.4,   86.0,  -43.1,   24.3,     34   6.0,   92.6,   75.0,  -42.5,   24.8,
  35   6.0,   97.0,   61.6,  -40.6,   24.6,     36   6.0,   98.5,   46.5,  -37.4,   23.6,

 *** AERMOD - VERSION  15181 ***     *** T:\JOBS - ACTIVE\161211 - Nicolas Israel
Pharmaceutical Waste\Job\Te ***       01/09/17
 *** AERMET - VERSION  12345 ***    ***                                          ***
08:09:49
                                                                        PAGE   6
 **MODELOPTs:   RegDFAULT CONC      ELEV      WARNCHKD  RURAL

              * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY
OF WEEK (HRDOW) *

 SOURCE ID = PRESSUREV    ; SOURCE TYPE = POINT    :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                DAY OF WEEK = WEEKDAY
    1  .0000E+00     2  .0000E+00     3  .0000E+00     4  .0000E+00     5  .0000E+00     6
.0000E+00    7  .1000E+01    8  .1000E+01
    9  .1000E+01    10  .1000E+01    11  .1000E+01    12  .1000E+01    13  .1000E+01    14
.1000E+01    15  .1000E+01    16  .1000E+01
   17  .1000E+01    18  .1000E+01    19  .0000E+00    20  .0000E+00    21  .0000E+00    22
.0000E+00    23  .0000E+00    24  .0000E+00
                                DAY OF WEEK = SATURDAY
    1  .0000E+00     2  .0000E+00     3  .0000E+00     4  .0000E+00     5  .0000E+00     6
.0000E+00    7  .1000E+01    8  .1000E+01
    9  .1000E+01    10  .1000E+01    11  .1000E+01    12  .1000E+01    13  .1000E+01    14
.1000E+01    15  .1000E+01    16  .1000E+01
   17  .1000E+01    18  .1000E+01    19  .0000E+00    20  .0000E+00    21  .0000E+00    22
.0000E+00    23  .0000E+00    24  .0000E+00
                                DAY OF WEEK = SUNDAY
    1  .0000E+00     2  .0000E+00     3  .0000E+00     4  .0000E+00     5  .0000E+00     6
.0000E+00    7  .0000E+00    8  .0000E+00
```

9 .0000E+00 10 .0000E+00 11 .0000E+00 12 .0000E+00 13 .0000E+00 14 .0000E+00 15 .0000E+00 16 .0000E+00
17 .0000E+00 18 .0000E+00 19 .0000E+00 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00

*** AERMOD - VERSION 15181 *** *** T:\JOBS - ACTIVE\161211 - Nicolas Israel Pharmaceutical Waste\Job\Te *** 01/09/17
*** AERMET - VERSION 12345 *** *** *** 08:09:49

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**MODELOPTs: RegDFAULT CONC ELEV WARNCHKD RURAL

* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = BROKENBAG ; SOURCE TYPE = VOLUME :
HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR
- -
DAY OF WEEK = WEEKDAY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .1000E+01 8 .1000E+01
9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01 13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .1000E+01
17 .1000E+01 18 .1000E+01 19 .0000E+00 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00
DAY OF WEEK = SATURDAY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .1000E+01 8 .1000E+01
9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01 13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .1000E+01
17 .1000E+01 18 .1000E+01 19 .0000E+00 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00
DAY OF WEEK = SUNDAY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .0000E+00
9 .0000E+00 10 .0000E+00 11 .0000E+00 12 .0000E+00 13 .0000E+00 14 .0000E+00 15 .0000E+00 16 .0000E+00
17 .0000E+00 18 .0000E+00 19 .0000E+00 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00

*** AERMOD - VERSION 15181 *** *** T:\JOBS - ACTIVE\161211 - Nicolas Israel Pharmaceutical Waste\Job\Te *** 01/09/17
*** AERMET - VERSION 12345 *** *** *** 08:09:49

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**MODELOPTs: RegDFAULT CONC ELEV WARNCHKD RURAL

* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = PROCESSEDW ; SOURCE TYPE = VOLUME :
HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR
- -
DAY OF WEEK = WEEKDAY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .1000E+01 8 .1000E+01

9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01 13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .1000E+01
17 .1000E+01 18 .1000E+01 19 .0000E+00 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00

DAY OF WEEK = SATURDAY

1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .1000E+01 8 .1000E+01
9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01 13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .1000E+01
17 .1000E+01 18 .1000E+01 19 .0000E+00 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00

DAY OF WEEK = SUNDAY

1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .0000E+00
9 .0000E+00 10 .0000E+00 11 .0000E+00 12 .0000E+00 13 .0000E+00 14 .0000E+00 15 .0000E+00 16 .0000E+00
17 .0000E+00 18 .0000E+00 19 .0000E+00 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00

**MODELOPTs: RegDFAULT CONC ELEV WARNCHKD RURAL

*** GRIDDED RECEPTOR NETWORK SUMMARY ***

*** NETWORK ID: UCART1 ; NETWORK TYPE: GRIDCART ***

*** X-COORDINATES OF GRID ***
(METERS)

300938.8, 300988.8, 301038.8, 301088.8, 301138.8, 301188.8, 301238.8, 301288.8, 301338.8, 301388.8,
301438.8, 301488.8, 301538.8, 301588.8, 301638.8, 301688.8, 301738.8, 301788.8, 301838.8, 301888.8,
301938.8, 301988.8, 302038.8, 302088.8, 302138.8, 302188.8, 302238.8, 302288.8, 302338.8, 302388.8,
302438.8, 302488.8, 302538.8, 302588.8, 302638.8, 302688.8, 302738.8, 302788.8, 302838.8, 302888.8,
302938.8, 302988.8, 303038.8, 303088.8, 303138.8, 303188.8, 303238.8, 303288.8, 303338.8, 303388.8,
303438.8, 303488.8, 303538.8, 303588.8, 303638.8, 303688.8, 303738.8, 303788.8, 303838.8, 303888.8,
303938.8, 303988.8, 304038.8, 304088.8, 304138.8, 304188.8, 304238.8, 304288.8, 304338.8, 304388.8,
304438.8, 304488.8, 304538.8, 304588.8, 304638.8, 304688.8, 304738.8, 304788.8, 304838.8, 304888.8,
304938.8, 304988.8, 305038.8, 305088.8, 305138.8, 305188.8, 305238.8, 305288.8, 305338.8, 305388.8,
305438.8, 305488.8, 305538.8, 305588.8, 305638.8, 305688.8, 305738.8, 305788.8, 305838.8, 305888.8,

*** Y-COORDINATES OF GRID ***
(METERS)

6256394.2, 6256444.2, 6256494.2, 6256544.2, 6256594.2, 6256644.2, 6256694.2, 6256744.2, 6256794.2, 6256844.2,
6256894.2, 6256944.2, 6256994.2, 6257044.2, 6257094.2, 6257144.2, 6257194.2, 6257244.2, 6257294.2, 6257344.2,
6257394.2, 6257444.2, 6257494.2, 6257544.2, 6257594.2, 6257644.2, 6257694.2, 6257744.2, 6257794.2, 6257844.2,
6257894.2, 6257944.2, 6257994.2, 6258044.2, 6258094.2, 6258144.2, 6258194.2, 6258244.2, 6258294.2, 6258344.2,
6258394.2, 6258444.2, 6258494.2, 6258544.2, 6258594.2, 6258644.2, 6258694.2, 6258744.2, 6258794.2, 6258844.2,
6258894.2, 6258944.2, 6258994.2, 6259044.2, 6259094.2, 6259144.2, 6259194.2, 6259244.2, 6259294.2, 6259344.2,
6259394.2, 6259444.2, 6259494.2, 6259544.2, 6259594.2, 6259644.2, 6259694.2, 6259744.2, 6259794.2, 6259844.2,
6259894.2, 6259944.2, 6259994.2, 6260044.2, 6260094.2, 6260144.2, 6260194.2, 6260244.2, 6260294.2, 6260344.2,
6260394.2, 6260444.2, 6260494.2, 6260544.2, 6260594.2, 6260644.2, 6260694.2, 6260744.2, 6260794.2, 6260844.2,
6260894.2, 6260944.2, 6260994.2, 6261044.2, 6261094.2, 6261144.2, 6261194.2, 6261244.2, 6261294.2, 6261344.2,
**MODELOPTs: RegDFAULT CONC ELEV WARNCHKD RURAL

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

(305048.9, 6258828.2, 64.5, 64.5, 0.0); (304518.6, 6259195.5, 51.4, 51.4, 0.0);
(304379.7, 6259315.8, 48.2, 48.2, 0.0); (304132.8, 6259406.7, 47.7, 47.7, 0.0);
(303874.1, 6259755.7, 47.8, 47.8, 0.0); (303199.3, 6259953.5, 41.1, 41.1, 0.0);
(301951.8, 6258998.8, 41.6, 41.6, 0.0); (301891.5, 6258591.6, 42.3, 42.3, 0.0);
(303909.5, 6257655.4, 70.2, 70.2, 0.0); (303892.7, 6259092.8, 57.1, 57.1, 0.0);
(303898.1, 6259045.9, 59.9, 59.9, 0.0); (303884.0, 6259008.0, 60.2, 60.2, 0.0);
(303914.5, 6259001.0, 60.6, 60.6, 0.0); (303955.5, 6258998.8, 59.8, 59.8, 0.0);
(303952.7, 6259059.5, 57.2, 57.2, 0.0);

**MODELOPTs: RegDFAULT CONC ELEV WARNCHKD RURAL

* SOURCE-RECEPTOR COMBINATIONS FOR WHICH CALCULATIONS MAY NOT BE PERFORMED *
LESS THAN 1.0 METER; WITHIN OPENPIT; OR BEYOND 80KM FOR FASTAREA/FASTALL

SOURCE ID	- - RECEPTOR LOCATION - - XR (METERS)	YR (METERS)	DISTANCE (METERS)

**MODELOPTs: RegDFAULT CONC ELEV WARNCHKD RURAL

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: TYPICAL ***
INCLUDING SOURCE(S): WATERTANK1 , WATERTANK2 , PROCESSEDW ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN OU/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)
305048.90	6258828.21	0.14270	(15092107)	304518.60	6259195.50	0.26671	(15053008)
304379.72	6259315.82	0.22022	(15102907)	304132.85	6259406.72	0.25983	(15051808)
303874.09	6259755.68	0.11649	(15010907)	303199.33	6259953.50	0.10752	(15101407)
301951.77	6258998.81	0.04808	(15021708)	301891.53	6258591.58	0.06846	(15092907)
303909.51	6257655.43	0.10772	(15072808)	303892.72	6259092.75	3.63560	(15040918)
303898.15	6259045.87	10.92586	(15113018)	303884.03	6259007.99	5.23627	(15112418)
303914.48	6259000.95	6.34046	(15032318)	303955.53	6258998.83	5.93811	(15050517)
303952.66	6259059.48	11.77716	(15060117)				

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): PRESSUREV , WATERTANK1 , WATERTANK2 , BROKENBAG , PROCESSEDW ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN OU/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)
305048.90	6258828.21	0.23002	(15092107)	304518.60	6259195.50	0.43011	(15053008)
304379.72	6259315.82	0.35635	(15102907)	304132.85	6259406.72	0.42049	(15051808)
303874.09	6259755.68	0.18894	(15010907)	303199.33	6259953.50	0.17362	(15101407)
301951.77	6258998.81	0.07817	(15021708)	301891.53	6258591.58	0.11074	(15092907)

303909.51 6257655.43 0.17360 (15072808) 303892.72 6259092.75 5.87257 (15040918)
303898.15 6259045.87 17.60520 (15113018) 303884.03 6259007.99 8.48683 (15112418)
303914.48 6259000.95 10.37357 (15032318) 303955.53 6258998.83 9.60268 (15050517)
303952.66 6259059.48 18.91122 (15060117)

**MODELOPTs: RegDFAULT CONC ELEV WARNCHKD RURAL

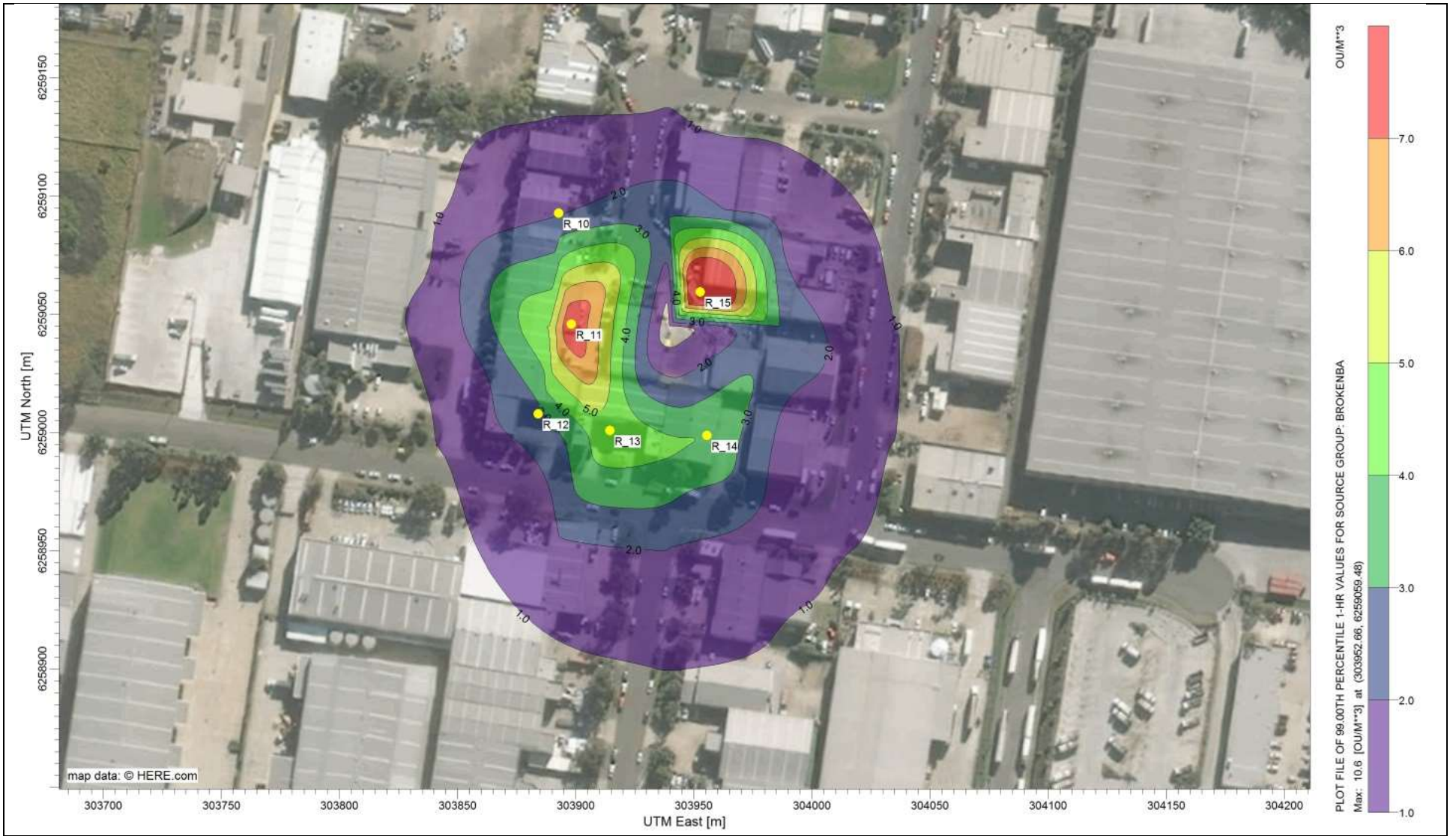
*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF OTHER IN OU/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	NETWORK RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	GRID-ID
TYPICAL	HIGH 1ST HIGH VALUE IS	11.77716	ON 15060117: AT (303952.66, 6259059.48, 57.17, 57.17, 0.00)	DC	
BROKENBA	HIGH 1ST HIGH VALUE IS	18.81895	ON 15060117: AT (303952.66, 6259059.48, 57.17, 57.17, 0.00)	DC	
PRESSURE	HIGH 1ST HIGH VALUE IS	11.86942	ON 15060117: AT (303952.66, 6259059.48, 57.17, 57.17, 0.00)	DC	
WORSTCAS	HIGH 1ST HIGH VALUE IS	18.91122	ON 15060117: AT (303952.66, 6259059.48, 57.17, 57.17, 0.00)	DC	
ALL	HIGH 1ST HIGH VALUE IS	18.91122	ON 15060117: AT (303952.66, 6259059.48, 57.17, 57.17, 0.00)	DC	

Attachment 3: Samples of Odour Impact Modelling Contours

SC1 – Scenario 1



SC2 - Scenario 2

SC3 – Scenario 3

SC4 – Scenario 4

SC5 – Scenario 5

SC6 – Scenario 6

SC7 – Scenario 7

Attachment 4: Results of Olfactometry Testing

ODOUR RESEARCH LABORATORIES AUSTRALIA

A Division of Peter W. Stephenson & Associates Pty Ltd
ACN 002 600 526 (Incorporated in NSW)
ABN 75 002 600 526

52A Hampstead Road
Auburn NSW 2144 Australia
Tel: (02) 9737 9991
E-Mail: pstephenson@orla.com.au

Olfactometry Test Report

The measurement was commissioned by SEMA on behalf of:

Client	Organisation:	National Integrated Creative Solutions
	Address:	PO Box 150 Seven Hills NSW 1730
	Contact:	Nicolas Israel
	Sampling Site:	9 Kenoma Pl, Arndell Park, NSW 2148
	Telephone:	0421 776 003
	Email:	20nicolas15@gmail.com
Project	ORLA Report Number:	5748/ORLA/01
	Project Manager:	Peter Stephenson
	Testing operator:	Ali Naghizadeh
	ORLA Sample number(s):	4633 to 4637 inclusive
	SEMA Sample number(s):	725922 to 725926 inclusive
Order	Analysis Requested:	Odour Analysis
	Order requested by:	SEMA on behalf of National Integrated Creative Solutions
	Date of order:	02 December 2016
	Order number:	4665
	Telephone:	02 9737 9991
	Signed by:	Ali Naghizadeh
	Order accepted by:	Ali Naghizadeh
Report	Date of issue:	13 December 2016

NATA accredited laboratory number 15043.

Accredited for Compliance with ISO/IEC 17025.

Investigated Item	Odour concentration in odour units 'ou' determined by Sensory odour concentration measurements, of an odour sample supplied in a sampling bag. All samples were received in good condition.
Analysis Method	The samples were analysed in accordance with AS/NZS4323.3:2001.
Identification	The odour sample bags were labelled individually. Each label recorded the testing laboratory, sample number, sampling location (or Identification) sampling date and time, dilution ratio (if dilution was used) and whether further chemical analysis was required.
Method	The odour concentration measurements were performed using dynamic olfactometry according to the Australian Standard 'Determination of Odour Concentration by Dynamic Olfactometry AS/NZS4323.3:2001. The odour perception characteristics of the panel within the presentation series for the samples were analogous to that for n-butanol calibration. Any deviation from the Australian standard is recorded in the 'Comments' section of this report.
Instrument Used	The Olfactometer used during this testing session was: AC'SCENT International Olfactometer
Measuring Range	The measuring range of the AC'SCENT International olfactometer is $12 \leq \chi \leq 76{,}000$ ou. If the measuring range was insufficient the odour samples will have been pre-diluted.
Environment	The measurements were performed in an air- and odour-conditioned room. The room temperature is maintained between ± 3°C.
Measuring Dates	The date of each measurement is specified with the results.
Instrument Precision	The precision of this instrument (expressed as repeatability) for a sensory calibration must be $r \leq 0.05$ in accordance with the Australian Standard AS/NZS4323.3:2001. AC'SCENT International Olfactometer: $r = 0.0054$ (February 2016) Compliance – Yes
Instrumental Accuracy	The accuracy of this instrument for a sensory calibration must be $A \leqq 0.20$ in accordance with the Australian Standard AS/NZS4323.3:2001. AC'SCENT International Olfactometer: $A = 0.027$ (February 2016) Compliance – Yes
Lower Detection Limit (LDL)	The LDL for the AC'SCENT International Olfactometer has been determined to be 12 ou
Traceability	The measurements have been performed using standards for which the traceability to the national standard has been demonstrated. The assessors are individually selected to comply with fixed criteria and are monitored every session to keep within the limits of the standard. The results from the assessors are traceable to primary standards of n-butanol in nitrogen.

13 December 2016

Peter Stephenson
Managing Director

Odour Olfactometry Results – 5748/ORLA/01

Sample Location	Sample ID No.	Sampling Date & Time	ORLA Sample No.	Analysis Date & Time (Completed)	Panel Size	Valid ITEs	Sample Pre-Dilution	Sample Odour Concentration (ou) [1 *]	Sample Odour Concentration (ou) [2 *]	Odour Character & Hedonic Tone [^ +]
Sample ID: 161503 - SWSA01 - Water Tank Air Space	725922	01-12-2016 12:06	4633	02-12-2016 10:30	4	8	Nil	8,200	8,200	Sour milk, raw meat, toilet cleaner, chlorine, bleach, paint, chocolate powder, menthol, minty, chocolate mint (+1.0)[^]
Sample ID: 161503 - SWSA02 - Final Product Bin	725923	01-12-2016 12:27	4634	02-12-2016 11:00	4	8	Nil	1,500	1,500	Garbage, meat, chocolate, burnt plastic, minty (-3.5)[^]
Sample ID: 161503 - SWSA03 - Open Bag of Waste	725924	01-12-2016 12:35	4635	02-12-2016 11:30	4	8	Nil	900	900	Garbage, urinal deodorant blocks, hospital cleaning products, medicinal, meat, fishy, burnt plastic, vinyl, menthol, swampy, earthy, rotten (-3.5)[^]
Sample ID: 161503 - SWSA04 - Raw Waste Bin	725925	01-12-2016 12:40	4636	02-12-2016 12:00	4	8	Nil	420	420	Hospital cleaning product, urinal deodorant block, soap, disinfectant, meat, butcher shop (-3.0)[^]

Odour Olfactometry Results – 5748/ORLA/01

Sample Location	Sample ID No.	Sampling Date & Time	ORLA Sample No.	Analysis Date & Time (Completed)	Panel Size	Valid ITEs	Sample Pre-Dilution	Sample Odour Concentration (ou) [1 *]	Sample Odour Concentration (ou) [2 *]	Odour Character & Hedonic Tone [^ +]
Sample ID: - SWSA05 - Raw Waste Bin Duplicate	725926	01-12-2016 12:47	4637	02-12-2016 12:30	4	8	Nil	540	540	Vegetable, fruit, Hospital cleaning product, urinal deodorant block, soap, disinfectant, meat, minty, musty, swampy (-2.0)[^]

Odour Panel Calibration Results – 5748/ORLA/01

Reference Odorant	ORLA Sample No.	Concentration of Reference Gas (ppm)	Reference Gas Measured Concentration (ou)	Panel Average Measured Concentration (ppb) [3]	Does this panel calibration measurement comply with AS/NZS4323.3:P2001 (Yes/No) [4]
n-butanol	4632	52	920	57	Yes

Comments: All samples were collected by National Integrated Creative Solutions and analysed by Odour Research Laboratories Australia at their

Sydney Laboratory. Notes from Odour Olfactometry Results:

[1] Sample Odour Concentration: as received in the bag

[2] Sample Odour Concentration: allowing for pre-dilution

[3] Panel Average Measured Concentration: indicates the sensitivity of the panel for the session completed

[4] Target Range for reference gas n-butanol is $20 \leq \chi \leq 80$ ppb and compliance with AS/NZ4323.3:2001 is based on the individuals rolling average and not on the panel average measured concentration. Panellist Rolling Average: SR = 59, PR = 54, GP = 57, TL = 57, PRA = 41

^ denotes the Average Hedonic Tone: describes the pleasantness of the odour being presented where (+5) represents Very Pleasant, (0) represents Neutral and (-5) represents Very Unpleasant and has been derived from the panellist responses at the recognition threshold.

+ This value is not part of our NATA Scope of Accreditation and AS4323.3

---------- END OF TEST REPORT----------

Attachment 5: Manufacturers Specifications for Odour Mitigation Measures

AirSolution 9304 Phantom - 4

Complex Odour Counteractant

Odour Eliminating Technology
Convert Odour Molecules Into Non-Volatile Compounds

Types of Odours Treated:

Organic Sewage Odours
Mercaptans
Amine Compounds
Phenol Odours
Organic Acid Odours
Grease Odours
Low Level H_2S (open areas)

AirSolution™ 9304 (Phantom - 4) Counteractant is a complex blend of essential oils, odiferous organic compounds found in plants. Phantom - 4 works through the process of odour counteraction to reduce odour complaints.

The odour counteraction of Phantom - 4 is a series of absorption and decomposition processes converting odour molecules into non-volatile compounds, reducing both their odour concentration and intensity. Phantom - 4 is optimised to eliminate the odours created by wastewater treatment and collection systems.

Phantom - 4 is non-toxic, non-corrosive in nature, making it ideal for a wide variety of applications. Phantom - 4 is safe to handle, fog or spray in areas where there will be human contact.

Specifications

Average Feed Rate Guideline

Topical:
Dilute RTU solution 100:1

Fogging Treatment:
9ml to 15ml of RTU per nozzle per hour

In-duct Treatment:
30ml of RTU per 43 - 85 m³ per minute air flow per hour

Misting Treatment:
1 x 20 litre drum of concentrate makes 200 litres RTU, then dilute 140:1 to 300:1

Guidelines for calculating chemical usage are estimates only. Actual usage is affected by odour concentration, environmental temperature, particulate levels etc. Contact your OCS sales representative to discuss your application.

Application Areas

- Municipal and Industrial Wastewater Operations
  - Grit and Screens Areas
  - Pump Stations
  - Collection Systems Areas
  - Sludge Processing and Storage Areas
- Municipal Solid Waste Operations
- Tanks, Ponds, Lagoons
- Foundry Operations
- Food Processing Exhaust

Application Systems

- AirStreme ™ AMS Misting System
- LMC ™ High Pressure Fogging System
- MistPro Chemical Dilution & Feed System
- QCID and VPS Systems

the odour management experts

Odour Control Systems (Aust) Pty Ltd
P O Box 179 Wingeon NSW 2296
P (02) 4961 6185 F (02) 4969 4218
www.odours.com.au

AS/NZS 4801:2001
OHS Management
Systems Certified

OCS

AirStreme™

AMS SYSTEM

ODOR COUNTERACTANT DELIVERY EQUIPMENT

- Integrated Controller Design
- Adjustable Touch-Pad Programming
- Weather Resistant Enclosure
- Internal Pressure Control
- Remote Control Ready

The Ecolo AMS System, combined with our effective odor specific AirSolutions is the most effctive method for eliminating odors in a broad range of industrial and environmental applications.

ECOLO®

ODOR CONTROL TECHNOLOGIES INC.

AMS System - Odor counteractant delivery system

A sophisticated automated misting system with features and versatility like no other competitively priced system in the industry. AirStreme AMS series Control Units integrate advanced electronics and durable mid-pressure pumps into one sleek and refined misting system. The AMS has the flexibility of digital programming with a back lit display and a 365-day calendar clock to accommodate even the most demanding range of programming options.

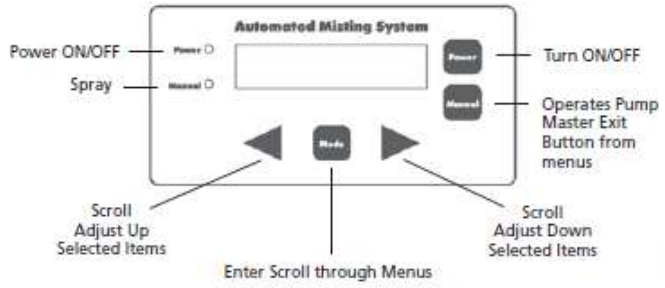
Whether used for misting water or chemical formulations, AirStreme AMS Control Units provide high quality and reliable service for many industrial and consumer applications. AMS Control Units set the standard for class, function and versatility.

- Trash Rooms
- Composting Plants
- Small Industrial Projects
- Processing Plants
- Transfer Stations
- Wastewater
- Exhaust Stacks
- Other Odorous Applications

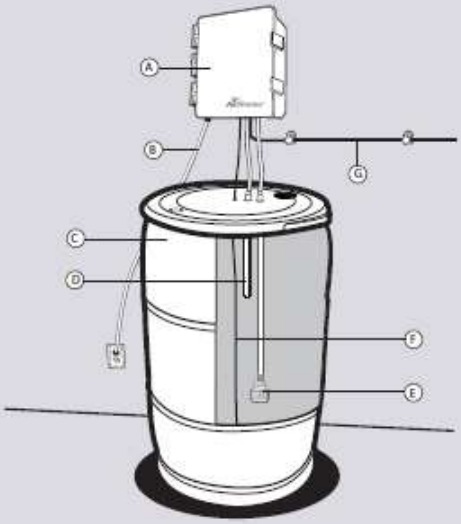
Controller Specifications:
Depth 18.54 cm/7.3"
Width 34.29 cm/13.5"
Height 37.03 cm/14.58"
Weight 13.15 kg/29 lbs

VOLTS	HZ	AMPS	HP	MAX AMB TEMP	NOZZLES
110/220	60	6.5	1/3	40°C (110°F)	≤ 80

The system is based on spray events. There can be up to 10 spray events in auto mode and up to 10 independent spray events in repeat mode. In auto mode the spray time is specified by the start time and the duration of spray. During the spray time the spray is continuous. In repeat mode the spray time is specified by the start time and stop time. In addition the spray pattern during the spray time is specified by the on cycle time and off cycle time.



Standard Install Configuration



PART	DESCRIPTION
A	AMS Controller
B	Power Cord
C	55 Gallon Drum
D	Return Line
E	Strainer
F	Tank Level Sensor
G	Discharge Line

FEATURES AND BENEFITS

- Integrated Controller Design
- Adjustable Touch-Pad Programming
- Weather Resistant Enclosure
- Internal Pressure Control
- Remote Control Ready
- 365-day Calendar Clock
- Large Backlit LCD display
- Non-Volatile Memory
- Battery Back-up
- Multiple Inputs
- Tamper Proof
- Easy to Install
- Electrically Certified

Ecolo Odor Control Technologies

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ISO 9001:2008 CERTIFIED

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