

ACTA
Bannockburn Composting Depot



7. Depot Maintenance

The following items are included in the depot maintenance program:

Depot Sign

The sign at the entrance will be kept in good condition at all times. Damage to the sign and/or signwriting will be repaired within 7 days of the damage occurring.

Fencing

Perimeter fences and gates will be kept in good condition; any damage will be repaired within 7 days.

Gates will be kept locked whenever the depot is unattended.

Drainage

The basin will be desilted as required to ensure 90% of its design capacity is always available.

Plant and Equipment

All plant and equipment at the depot will be maintained in good working order and will be fit for the purpose for which it is to be used.

8. Composting Trials

From time to time, ACTA will need to undertake a composting trial to determine whether material that is not included on the list of approved materials is suitable for composting. Whenever this situation arises ACTA will seek EPA approval to undertake a trial, having provided the EPA with the following information:

- A description of the purpose and intended outcomes of the trial
- A description of the site location and conditions
- Details of community consultation (if community consultation is to be included in the trial)
- The feedstock proposed for the trial, including details of its physical and chemical characteristics and its source (taking into consideration whether the material is classified as a "listed" waste)
- The quantities of individual feedstock proposed for the trial and the total quantity of materials that will be included in the trial
- The duration of the trial
- A detailed description of the composting process/technology to be used in the trial and the design and layout of the trial area and associated infrastructure
- A detailed description of all processes that will be undertaken during the trial from receipt of feedstock to achieving final product

January 2019 - Rev 1

13

ACTA
 Bannockburn Composting Depot



- A detailed description of the environmental risks associated with the trial (including feedstock, processes, final products) and measures proposed for the management and monitoring of these risks
- A detailed description of monitoring proposed for the composting process, including any milestones or hold points for specific testing and reporting, and details of the testing and reporting requirements
- Details of how the environmental performance of the trial will be assessed
- Details of how complaints will be recorded and managed
- Details of the information that will be reported to the EPA at the completion of the trial, including applications for the composted product (for both the trial material and future markets) and the environmental performance of the trial

9. Record Keeping

Written records are kept of the following activities:

Daily

- details of raw material received i.e.:
 - source of material
 - date received
 - quantity received
- details of any incidents/non-compliance with the requirements of the EMP; refer to Appendix C for further details.
- details of any complaints received, and corrective action taken; refer to Appendix H for further details.

Monthly

- summary of weekly reports
- condition of working surfaces and trafficable areas

10. Performance Indicators

ACTA's aim is for its activities to have a positive environmental outcome. The following performance indicators will be adopted to ensure this outcome is achieved:

10.1 Odour and Dust

No complaints of odour and/or dust nuisance will be received.

All complaints will be recorded in accordance with the requirements set out in Appendix E. Details of all complaints, and corrective action taken, will be forwarded to the EPA within 7 days of corrective action being completed.

10.2 Water Quality

No surface water from the composting depot will leave the site.

January 2019 Rev 1



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Bannockburn Composting Depot



10.3 Compost Quality

Compost produced at the site will meet the relevant requirements of Australian Standard AS4454.

January 2019 - Rev 1





APPENDIX A

Certificate of Title Details





APPENDIX B

Surface Water Runoff Calculations



ICFA
 Rannochburn Composting Depot



Surface Water Runoff Calculations

The runoff coefficients used in the following calculations are based on:
 a) observed results at similar facilities, and
 b) composting pile configuration.

Compost Area

Catchment Area: 20,000m²

Storm Recurrence: 1 in 25 year ARI

Rainfall Intensity: 7.6mm/hour

Storm Duration: 24 hours

Runoff Coefficient: 0.40

Total Runoff: 20,000m² x 0.0076m x 24 x 0.40 = 1,460m³

Water Storage Capacity = 1,812m³



APPENDIX C
Odour Modelling Report



TO: [illegible] FROM: [illegible] DATE: [illegible]



APPENDIX D

Fire Safety Report



ACCA
Bannockburn Composting Depot



Fire Safety Report

Fire Protection Measures

This is a summary of the fire protection measures that will be installed to control any outbreaks of fire from within or outside of the site, a detailed description of CFA requirements is attached to this appendix.

- controlling pile dimensions to control internal pile temperature
- monitoring pile temperature to ensure it is kept below 80° C to avoid risk of spontaneous combustion
- maintaining a 6m wide buffer area free of vegetation around the composting area.
- mains water is available at the site
- provision of fire fighting infrastructure consisting of:
 - 11kL trailer mounted tank fitted with a high pressure, petrol driven pump
 - 2 x 48kL water tanks connected to the local water authority supply main
 - a 25L/sec petrol driven pump fitted to the tank outlet
 - two twin head hydrant outlets supplied from the fire water storage tanks via a 50mm diameter pipe
 - four fire hose reels, 50m long, supplied from the fire water storage tanks via a 50mm diameter pipe

Fire Risk Assessment

An assessment of the fire risk associated with each of the materials to be received at the site is set out below:

- **Shredded green organics**

This assessment is based on the fact that the green organics have gone through a sorting and shredding process before being delivered to the site, thereby reducing the risk of contaminants like dry cell batteries, rags and paper being present that might pose a combustion risk. Another important factor is that 500m³ is the maximum volume of green organics to be stored at the site.

On this basis, the green organics pose a medium fire risk.

- **Activator**

The moisture content of the activator is approximately 30 – 35%, which means there is the potential for spontaneous combustion. However, as the maximum amount to be stored on site is 100m³, the fire risk of the activator is assessed as low.

- **Grease Trap Waste**

Grease trap waste consists of about 95% water and is therefore assessed as not being a fire risk.

- **Hatchery Waste**

Hatchery waste consists of water, eggs and dead hatchlings. Based on its high moisture content, it has been assessed as not being a fire risk.

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- **Abattoir Waste**

Abattoir waste has a moisture content of 60 – 65% and is therefore assessed as being low risk.

- **Compost Windrows**

Compost windrows will have a moisture content of 25 – 40%, depending on feedstock moisture content. This means the piles can be categorised as having the potential for spontaneous combustion. The temperature monitoring data from the recent RD&D trial shows that pile temperatures rarely exceeded 70°C, and never exceeded 75°C, well below the 90°C the EPA considers a trigger for rapid self heating that may result in spontaneous combustion.

However, spontaneous combustion has never occurred elsewhere where ACTA's static pile composting system was being used. The best example of this is the Cleanaway site at Wingfield, South Australia, where there were two windrows in place, one of 4,000m³ windrow was in place that accepted 11,000m³ of industrial waste over a year and a second windrow that accepted 7,000m³ of organic waste also over a year.

On this basis, the fire risk from windrows is assessed as low.

Storage

The only materials stored at the site not directly involved in composting activities will be 100m³ of activator and 500m³ of shredded green waste. All other materials will be processed immediately they are received.

Internal Fire Hazard Risk Minimisation

The following measures will be adopted to minimise the risk of a fire emanating from site activities:

- The total volume of green organics stored on site will not exceed 500m³. It will be stored in piles not exceeding 100m³ and a separation distance of 3m will be maintained between the windrows
- The total volume of activator stored on site not exceed 100m³ and it will be stored in a windrow less than 2m high and 4m wide to prevent internal heat building up. A separation distance of 3m will be maintained around the windrow.
- All feedstock arriving on site (other than green organics) will be processed immediately it is unloaded
- A separation distance of 3m will be maintained between all windrows within the site and there will be a minimum separation distance of 5m around the perimeter of the windrows

External Fire Hazard Risk Minimisation

A 6m wide fire break will always be maintained around the perimeter of the composting site.

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Bannockburn Composting Depot



Fire Emergency Management Plan

The following factors were considered in preparation of the emergency management plan:

- The nature of site activities (composting)
- Material characteristics (organic)
- Size of operation (2Ha)
- Number of employees (1)
- Persons authorised to access the site (drivers of authorised vehicles)
- No public access
- Fire risk (minimal)

Based on the above factors, the plan focuses on precautionary measures and measures to be taken if a fire occurs.

Precautionary Measures

On days of declared high or extreme fire danger, the following measures will be implemented:

- Check fire water tanks are full, and all valves are operational
- Check hose reels are operational
- Check trailer mounted tank is full, and pump is operational
- Check front end loader fuel tank is full
- Check buffers around all windrows are clear of organic matter
- Check fire break is clear of vegetation
- Measure internal windrow temperatures and reduce volume of any windrows where temperature exceeds 70°C

Fire Control Measures

If a fire within the site occurs, the following actions will be taken:

- Ring 000 and provide fire and location details (607 Bannockburn-Sheffield Road, Bannockburn)
- Depending on the location and size of the fire:
 - Small fire, smother with soil using front end loader
 - Medium fire, ditto
 - Large fire, wet down using fire hose reels
 - Failing these measures, wait for CFA to arrive.
- If a fire external to the site occurs, ring 000 and provide fire and location details (607 Bannockburn-Sheffield Road, Bannockburn)

Fire Emergency Information Book

A fire emergency information book will be prepared and stored in a Fire Emergency Information Container at the entrance to the site.

The book will contain a site map with the fire water storage tanks and hydrants prominently marked. The container will be painted red with the words 'Emergency Information' in white lettering, 40mm high.

Attachment: CFA fire safety requirements



APPENDIX E

Incident Recording Form


Bannockburn Composting Depot



Date:

Raw Materials Received:

Type of Material:

Source:

Quantity Received:

Summary of Activities Undertaken:

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Details of any incidents/non compliance with the requirements of the EMP and corrective action taken:

.....
.....
.....
.....
.....
.....

Name & signature of person completing the report:

.....



APPENDIX F

Complaint Resolution Forms

ACTA
Bannockburn Composting Depot



COMPLAINTS FORM

Attention: EPA Licence Coordinator:

ACTA
Bannockburn Composting Depot

COMPLAINT DETAILS

Date: 12/09/2019 Time: 10:30

Name and Address of Person Lodging

Complaint:

Tel. No:

Complaint Details:

.....

.....

.....

.....

.....

Complaint Received by:

Signature:

Completed Complaints Form Received by Site Supervisor:

(Name)

Date: 12/09/2019 Time: 10:30

Signature:

1671
Rancho Abasco Composting Depot



COMPLAINTS ACTION FORM

Attention: EPA Licence Coordinator

Date: 12/1/2019

Name and Position of Person Investigating Complaint: [Redacted]

Date Complaint Received: 12/1/2019

Brief Details of Complaint: [Redacted]

[Redacted]

[Redacted]

Issues/Items to be Investigated: [Redacted]

[Redacted]

[Redacted]

[Redacted]

Results of Investigation: [Redacted]

[Redacted]

[Redacted]

Details of Corrective Action Being Taken: [Redacted]

[Redacted]

[Redacted]

Complainant Advised of Corrective Action being Taken: Yes / No

Site Supervisor: [Redacted] Date: 12/1/2019

1074
Bannockburn Composting Depot



CORRECTIVE ACTION IMPLEMENTATION DETAILS

Details of Corrective Action (including date implementation to be completed):

.....
.....
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.....
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.....

Amendments Required to Management Plan: Yes / No

Details of Amendments Required:

.....
.....
.....
.....

Date Amendments Forwarded to EPA:/...../.....

Name of EPA Officer Receiving Amendments:

Site Supervisor: **Date:**/...../.....



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VOLUME 01217 FOLIO 795

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LAND DESCRIPTION

Lots 1, 2 and 3 on Title Plan 552584B,
PARENT TITLES
Volume 01217 Folio 714 Volume 02945 Folio 011
Created by instrument 0824936 30/06/1910

REGISTERED PROPRIETOR

Estate Fee Simple
Joint Proprietors



AJ51EB290 28/02/2012

ENCUMBRANCES, CAVEATS AND NOTICES

MORTGAGE AK010765B 08/11/2012
WESTPAC BANKING CORPORATION

Any encumbrances created by Section 88 Transfer of Land Act 1958 or Section 24 Subdivision Act 1988 and any other encumbrances shown or entered on the plan set out under DIAGRAM LOCATION below.

DIAGRAM LOCATION

SEE TP552584B FOR FURTHER DETAILS AND BOUNDARIES

ACTIVITY IN THE LAST 125 DAYS

NIL

DOCUMENT END





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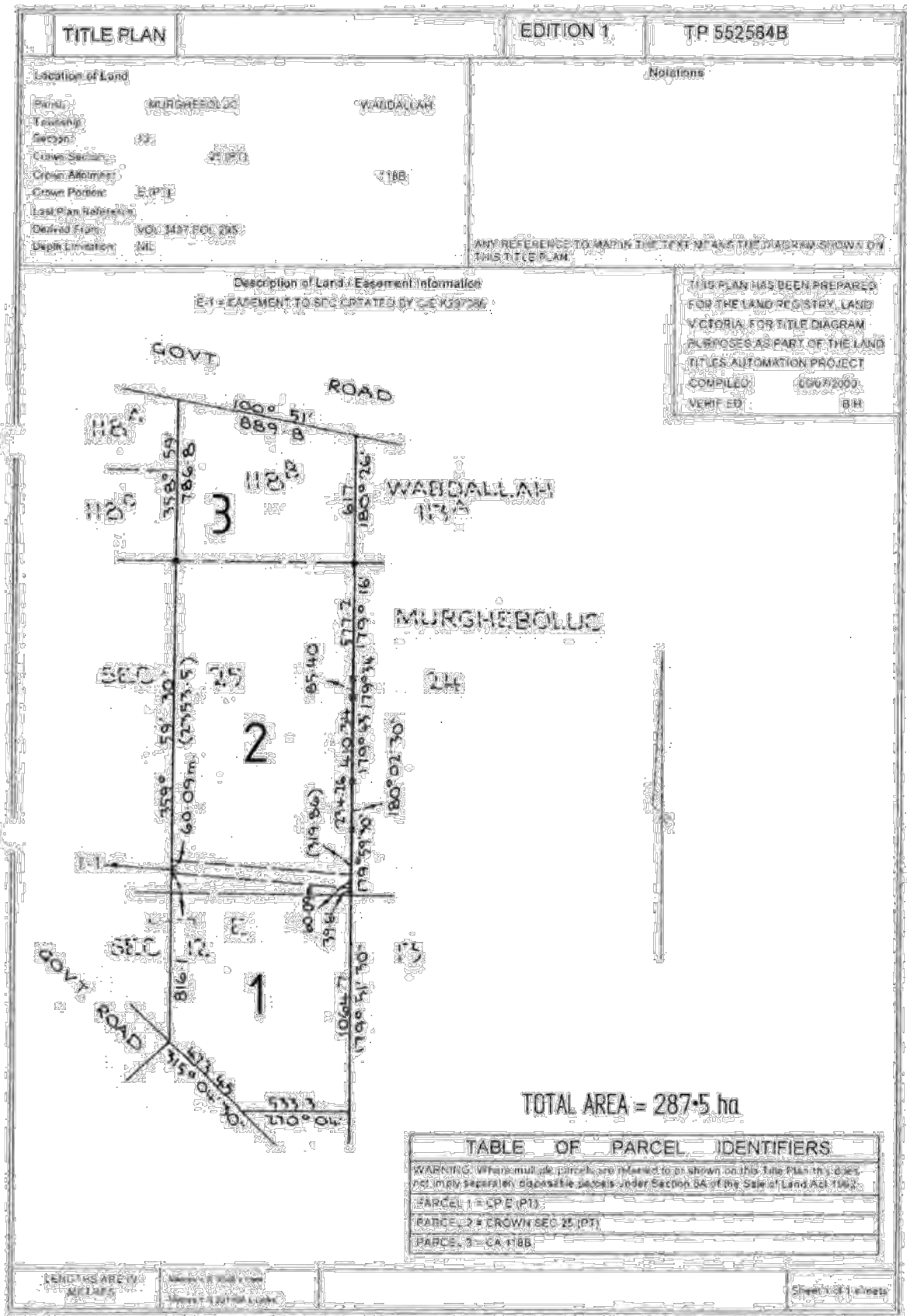
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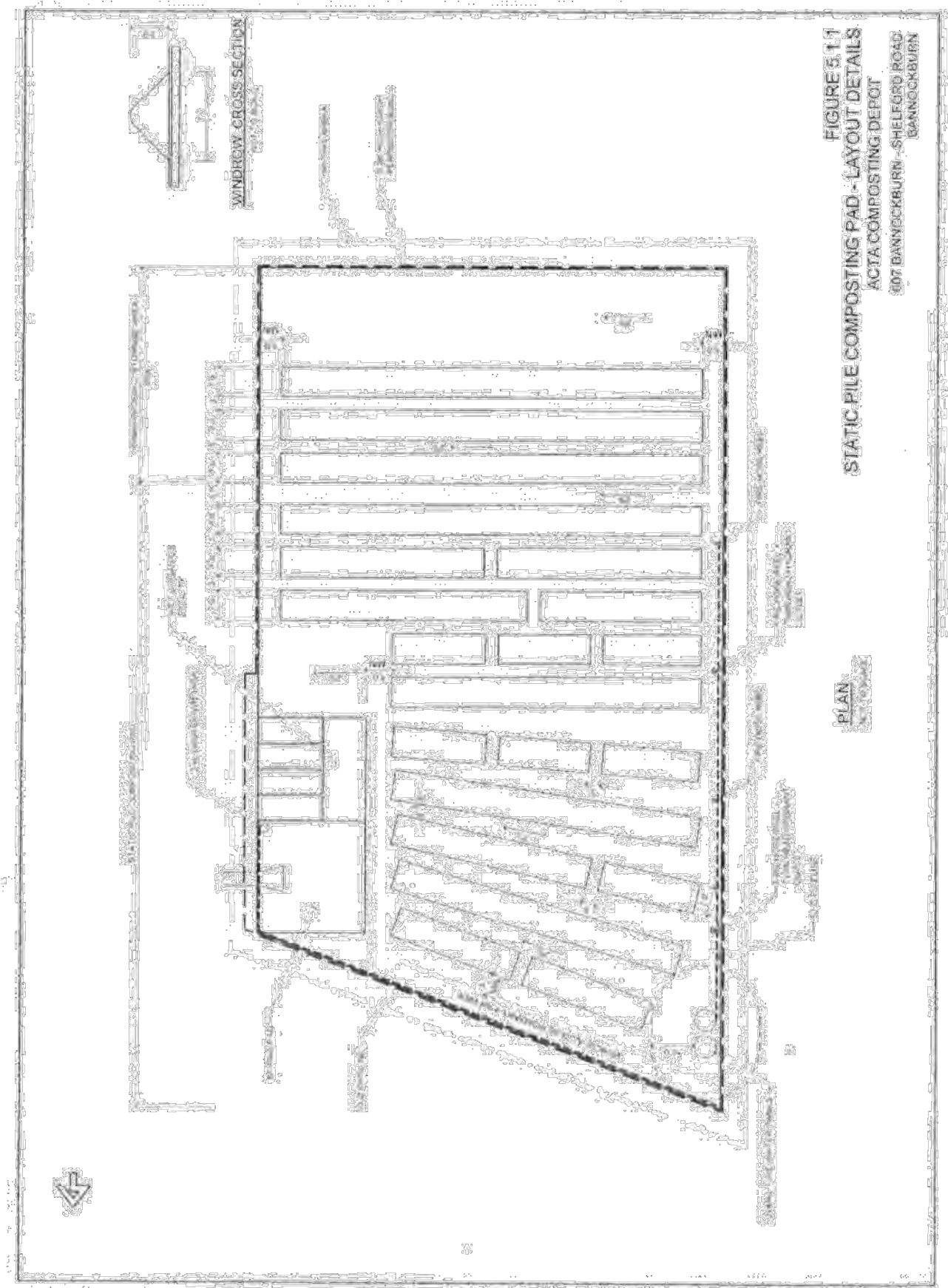
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**Green Waste Compost Odour Modelling
Bannockburn Site**

For

**Advanced Composting Technologies of
Australasia Pty Ltd**

Prepared by

Vic Natoli
V&C Environment Consultants Pty Ltd
82 Snell Grove
Oak Park VIC 3046
ABN 28 071 866 790

10th November 2017

V&C ENVIRONMENT CONSULTANTS PTY LTD

TABLE OF CONTENTS

1	OBJECTIVE	1
2	MODELS USED	1
3	ODOUR EMISSION SOURCES	1
3.1	COMPOST PILES	1
3.1.1	Number and Size of Piles	1
3.1.2	Odour Emissions	1
3.1.3	Odour Emission Rate Used in the Model	1
3.1.4	Conservativeness of Estimation	1
3.2	COMPOST STOCKPILE	1
3.2.1	Odour Emissions	1
3.2.2	Odour Emission Rate Used in the Model	1
3.2.3	Conservativeness of Estimation	1
3.3	LOADING OF FINISHED COMPOST FOR TRANSPORT	1
3.3.1	Odour Emissions	1
3.3.2	Odour Emission Rate Used in the Model	1
3.4	OTHER ODOUR SOURCES	1
4	MODEL PARAMETERS	6
5	MODEL RESULTS	7
5.1	SUMMARY	7
5.2	COMPARISON TO OBSERVATIONS	7
5.3	POTENTIAL FOR NUISANCE	7

Appendices

1. Ektimo Emission Test Report - Green Waste Compost Pile Flux Hood Test Results
2. Ausplume Odour Emission Estimation - Freshly Exposed Compost
3. Green Waste Composting Site Highest and 9th Odour Highest Contour Plots
4. Draft Ektimo Emission Test Report - Highly Odorous Waste Compost Pile Flux Hood Test Results

1 Objective

To determine the extent and impact of odours which may be emitted from the composting of green waste material on the proposed compost site. The site is located approximately 7 km west of Bannockburn on a privately owned farm.

2 Models Used

The predicted odours were determined using the current Victorian EPA approved Gaussian plume dispersion model AERMOD with the AUSMOD GUI interface developed by pDs Consultancy.

Metrological data files for the location were developed by pDs Consulting. The five Bannockburn files (2012 – 2016) were generated using the CSIRO TAPM model, as the closest meteorological is located at the Lethbridge airpark, approximately 13.7 km to the north of the site.

Under advice from pDs Consultancy, the former AUSPLUME model was used to reverse calculate the odour emission rates from near field observations made during compost pile mixing and opening of the compost piles.

3 Odour Emission Sources

3.1 Compost Piles

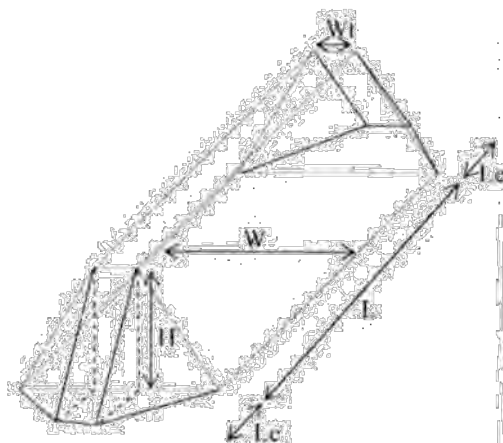
3.1.1 Number and Size of Piles

ACTA envisages the receipt of approximately 360 m³ of green waste per week which would be mixed with ACTA's proprietary activator mixture (40 m³/week) into two piles per week. The composting process will take approximately 12 weeks in total, therefore, there may be a maximum of 24 piles on the site at any one time.

The green waste would form piles of approximately 200 m³ each, which would reduce in volume by approximately 30% over the compost period, leaving a residual volume of approximately 140 m³ per pile.

The average size of each pile would be approximately 20m long, 5m wide and initially 3.1 m high after mixing (see volume calculation method below). This height would reduce to approximately 2.2 m high by the end of the composting process and produce approximately 140 m³ of composted material per pile and 280 m³ week from the site operations.

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The volume of the pile was determined by breaking it up into the following objects:

The main body of the pile is approximated by a prism with a trapezoid cross section. The volume is calculated by:

$$\text{Vol. of main body} = (W+Wt)/2 \times L$$

Each end of the pile is broken up into a triangular prism and a triangular pyramid. The volume is calculated by:

$$\text{Vol. of triangular prism} = H \times Le/2 \times Wt$$

$$\text{Vol of pyramid} = (1/3 \times Le \times (W-Wt) / 2 \times H)$$

$$\text{Vol. of each end} = \text{Triangular Prism} + \text{Pyramid}$$

Total Pile Volume =

$$\text{Volume of main body} + 2 \times \text{Volume of each end}$$

For modelling purposes, Wt was made equal to 1m and Le equal to 2m.

3.1.2 Odour Emissions

A green waste pile was mixed for the purpose of odour measurements on the 9th February 2017.

NOTE: This was not the same pile as the one used for testing waste and compost parameters, as ACTA did not initially intend composting green waste commercially.

Odour flux hood samples were carried out by the emission test firm Ektimo. Observations have found down wind odours from ACTA compost piles decrease over time, therefore, three odour samples were taken from the top of a green waste pile:

- Within 24 hours of the pile being mixed (9/2/17);
- Approximately 2-3 weeks after the pile was mixed (28/2/17); and
- After the pile typically would have pasteurised and the more odorous compounds will have broken down (14/3/17).

Refer to Ektimo Emission Test Report in Appendix 1.

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The testing found the following emission rates:

Table 1: Green waste pile odour emission rates

Date	Odour Emission Rate (ou/m ² /min)	Surface Temp. (°C)
9/2/17	31	45
28/2/17	29	45
14/3/17	45	60

Interestingly, the odour increased over time. In discussion with Ektimo staff, they suspect that the increase in the temperature immediately below the surface at the test location was responsible for the emissions increase. It is also suspected that as the temperature increases and the sides of the pile compact, the emission are primarily emitted from the top of the pile. This would explain the downwind observations (that the odour decreases over time) and the increase in the measured emissions at the top of the pile.

3.1.3 Odour Emission Rate Used in the Model

Even though it is suspected that the odour is preferentially discharged from the top of the pile, the odour emission rate measured by Ektimo was used across the entire footprint of the piles.

The piles on site will have a variety of ages, from fresh to nearing completion, therefore an average of the measured emission rates was used.

Average Odour Emission Rate: 34 ou/m²/min

As discussed above, the average pile size will be 18m x 5m = 90m². However, as the piles can vary in size depending on the green waste moisture content, the maximum envisaged pile size of 20m x 5m = 100m² has been used in the model.

As the piles will be placed across the entire site and the odour emissions will occur from an elevated position, it was decided to model the entire site as a volume source.

The total odour emissions from the site was calculated as follows:

Average odour emission rate x Footprint of each pile x maximum number of piles =

$$34 \text{ ou/m}^2/\text{min} \times 100\text{m}^2 \text{ per pile} \times 24 \text{ piles} = 81,600 \text{ ou/min (1,360 ou/sec)}$$

The area of the site which will contain compost piles is approximately 100m wide and the average pile height will be approximately 2.6 m high (3m initial height and 2.2 final height).

3.1.4 Conservativeness of Estimation

The value used is considered very conservative as it is assumed the same emission rate occurs over the entire footprint of the pile. This is a very conservative assumption given that the top of the pile (where the odour was measured) emits the greatest amount of odour.

3.2 Compost Stockpile

3.2.1 Odour Emissions

After the material has completed composting, it must be screened to remove larger pieces of wood that have not broken down before it can be sent out as a finished product. The material waiting to be screened will be stockpiled. Disturbing the mature compost piles will generate odour, with the greatest amount of odour being generated when stockpiling is complete (i.e. when there is the maximum surface area of freshly disturbed compost). Worst case, there will be approximately 200m³ of composted material each week which will be stockpiled for screening (based on 2 deliveries of green waste per week).

It was not possible to determine the odour generated by a freshly exposed pile of mature compost, however, downwind observations were made of a freshly exposed face during sampling of the green waste pile.

The observations made are as follows:

Date:	1/8/16
Wind Speed:	5 km/h (1.4m/s)
Temperature:	16°C
Wind Direction:	NW
Max Distance Odour Detectable:	30m

AUSPLUME modelling found an odour emission rate of 300 ou/s generated 1 odour unit at ground level at a 30m distance. Refer to Appendix 2 for Ausplume plot, output file and met file.

The excavation face was approximately 2.5m wide and 2 m high, i.e. 5 m² of exposed fresh compost. Therefore, the odour generated was 300 ou/s / 5 m² = 60 ouv/s/m².

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3.2.2 Odour Emission Rate Used in the Model

As stated in section 3.1.1 above, the maximum expected volume of mature composted material will be approximately 280m³ per week. A pile 30m long, 5m wide and 3.4m high would have a volume of 280m³ (using the method shown in section 3.1.1 above) and a surface area of approximately 267 m² (approximating the pile as a simple trapezoid without the base or ends).

The odour emission rate from the stockpile would be:

$$60 \text{ ou/s/m}^2 \times 267 \text{ m}^2 = 16,000 \text{ ou/s}$$

The stockpile was modelled as volume sources with a length of 30m and a height of 3.4 m.

3.2.3 Conservativeness of Estimation

It has been observed that the odour from newly moved mature compost is initially strong and decreases noticeably over a period of days, however, the maximum odour has been modelled as a constant source. The volume of the pile is also modelled as a constant size, even though it will decrease to zero as it is taken off-site for delivery to customers.

3.3 Loading of Finished Compost for Transport

3.3.1 Odour Emissions

The finished compost will be placed into tipper trucks for transport to the customer. The odour will increase as the truck is filled, with the largest amount of odour generated when a layer of compost is covering the entire area of the truck tray i.e. when the largest surface area of compost is exposed.

3.3.2 Odour Emission Rate Used in the Model

A truck tray is approximately 2m x 10m, which provides a surface area of 20m². Based on the emission rate for freshly exposed mature compost calculated in 3.2.1 above (60ou/m²/s), then the following emissions can be calculated from the truck tray:

$$20\text{m}^2 \times 60\text{ou/m}^2/\text{s} = 1200 \text{ ou/s}$$

The tray has been modelled as an area source and the source is represented by a rectangle 2m x 10m which is elevated 2.5m above ground level.

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3.4 Other Odour Sources

Odour will also be generated when green waste is delivered and moved across the site, when the compost is screened and when the piles are initially mixed. However, as there will only be one front end loader, only one operation can be carried out at any one time.

The loading of compost into the truck is likely to expose the largest area of freshly disturbed compost and therefore result in the greatest level of odour generation. Therefore, this was the operation that was modelled (section 3.3 above)

4 Model Parameters

Receptor Grid – a Cartesian 40m x 40m grid extending out to 1km around the site. The receptor grid was chosen in order to include the closest residential premises approximately 880m NW of the site

Meteorological Data File – There were 5 years of runs covering the years 2012 to 2016. The meteorological data files for the site were developed by pDs Consulting. The files were generated using the CSIRO TAPM model, as the closest meteorological monitoring site is located at the Leithbridge airpark approximately 13 km to the north of the site.

Averaging Time – The shortest averaging time AERMOD can produce is a 1 hour average, whereas the EPA odour criteria in the State Environment Protection Policy (Air Quality Management) is a 3 minute average. The results of the modelling have therefore been converted to a 3 minute average using the following formula:

$$C_t = C_{60} (60/t)^{0.2}$$

Where:

- ⇒ C_t is the concentration at an averaging time of t minutes
- ⇒ C_{60} is the concentration at an averaging time of 60 minutes
- t is the averaging time in minutes

The conversion factor from a 60 minutes to a 3 minute averaging time is therefore $(60/3)^{0.2} = 1.82$. Therefore, the predicted one hour average odour concentrations were multiplied by 1.82 before being presented in this report for discussion.

5 Model Results

5.1 Summary

The model results are summarized in the contour plots include in Appendix 3. There are two plots for each year, the highest concentration calculated at each receptor and the 9th highest (99.9th percentile) concentration calculated at each receptor. Two final plots are also included, which are the 2012-2016 highest contour plots overlain over each other for comparison purposes and the 9th highest contour plots overlain over each other.

The plots show that the predicted 1 odour unit contour (the limit of detection), just crosses the public roadway for the highest odour plots, while the 0.5 ou contour intersects the roadway for the 9th highest odour plot. The predicted odour at the closest residence to the north-west was approximately 0.5 – 0.6 ou using the highest concentrations and 0.3 – 0.4 ou for the 9th highest concentrations.

5.2 Comparison to Observations

ACTA has been trialling the composting of abattoir wastes, grease trap, chicken hatchery waste and chicken mortalities on the same property under its RD&D approval. As part of the approval, Ektimo, an independent and EPA approved organisation, has been retained to carry out downwind observations of the odour level from these highly odorous waste compost piles. The survey has yet to be concluded, however, discussion with personnel carrying out the survey indicates the detectable odour has been in the range of 250m – 350m from the site. In order to simulate a commercial operation, the site was nearing capacity at the time and included stockpiles of material which had completed the composting process. As noted in section 3.1.3, the average odour emission rate from the green waste pile was 34 ou/m²/min. This compares to the highly odorous waste compost piles which had average emission rates over the trial period of 32, 52, 82 and 44 ou/m²/min respectively for the wastes types listed above (refer to Ektimo draft emission test report in Appendix 4).

The odour observed by Ektimo was detectable at distances comparable to the 9th highest plots. Given the odour emissions from the highly odorous waste compost piles are higher than the odour emitted by the green waste piles, it is apparent that even the 9th highest predictions are an over-estimation of the odour impact. This is likely due to several conservative assumptions that were made in the modelling and detailed in section 3 above.

5.3 Potential for Nuisance

The 9th highest odour model predictions were the closest to observations made downwind of the site. This modelling predicts a safety factor of 2 before odours are just detectable at the closest roadway and a safety factor of approximately 3 before odour from the site is just detectable at the closest residential premises. Therefore, both the conservative modelling and actual observations indicate that the level of odour generated by the green waste composting process should not be detectable on public roadways or residential premises.

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APPENDIX I

EKTIMO EMISSION TEST REPORT
GREEN WASTE COMPOST PILE FLUX
HOOD TEST RESULTS



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Report Number R004009

Emission Testing Report
Advanced Composting Technologies of Australasia Pty Ltd

Document Information

Client Name: Advanced Composting Technologies of Australasia Pty Ltd
 Report Number: R004009
 Date of Issue: 13 April 2017
 Attention: Simon Atkinson
 Address: PO Box 489
 Meadows SA 5201
 Testing Laboratory: Ektimo (ETC) ABN 74-474 273 172

Report Status

Format	Document Number	Report Date	Prepared By	Reviewed By (1)	Reviewed By (2)
Preliminary Report					
Draft Report	R004009	13/04/2017	CBU	GSC	GTR
Final Report					
Amend Report					

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Amendment Record

Document Number	Initiator	Report Date	Section	Reason
Nil				

Report Authorisation

Greg Sceneay
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NATA Accredited Laboratory
No. 14601

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Accredited for compliance with ISO/IEC 17025, NATA is a signatory to the ILAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.



Memo 13 April 2019

Table of Contents

1	Executive Summary	4
2	Results	5
2.1	Event 1 – Pile 2	5
2.2	Event 2 – Pile 2	6
2.3	Event 3 – Pile 2	7
4	Plant Operating Conditions	8
5	Test Methods	8
6	Quality Assurance/ Quality Control Information	8
7	Definitions	9



1 EXECUTIVE SUMMARY

Ektimo was engaged by Advanced Composting Technologies of Australasia Pty Ltd to perform odour monitoring of a pile of green waste mixed into dried compost material. The odour monitoring program was performed over three test rounds commencing on day one where the 'green waste pile' was fresh, then at 2+ weeks and 5 weeks after pile first prepared.

Monitoring was performed as follows:

Test Round	Green Waste - Pile 2	Test Date	Test Parameters*
Event 1	Fresh	9 February 2017	Odour flux
Event 2	After 2+ weeks	28 February 2017	Odour flux
Event 3	After 5 weeks	14 March 2017	Odour flux

The methodologies chosen by Ektimo are those recommended by the Victorian Environment Protection Authority (as specified in A Guide to Sampling and Analysis of Air Emissions and Air Quality, December 2002).

All results are reported on a dry basis at STP (except odour wet - STP). Unless otherwise indicated, the methods cited in this report have been performed without deviation.



2 RESULTS

2.1 Event 1 - Pile 2

Client		Advanced Composting Technologies of Australasia Pty Ltd		Test Location	Pile 2 - Fresh Green Waste
Date		09/02/2017			
Report No.		R004000			
Ektimo Staff		Bronson Stoneham & Greg Scenery			
Test Location Details					
GPS coordinates	38°23'7"S, 144°16'16"E				
Location Description	South-western side of stockyard				
Surface Description	Fresh Green waste and activator				
Area Classification	Agricultural				
Source dimensions (L x W x H), m	6 x 6 x 2.2				
Source area, m ²	45				
Sampling Method	AS4323.4 (Flux)				
Sampling Results		Test 1		Test 2	
Sampling time, hrs	1333 - 1342		1344 - 1353		
Sample dilution	1		1		
Odour concentration, ou	1400		1600		
Hedonic tone	mildly unpleasant		mildly unpleasant		
Odour character	earth, compost, pine bark, stale air		earth, compost, pine bark, stale air		
Average Odour Concentration, ou	1500				
Odour Flux Rate, ou/m ² /min	31				
Odour mass rate, ou/min	1400				
Flux Testing Parameters					
Equilibration time, hrs	1308 - 1332				
Sweep Rate, L/min	5.04				
Penetration Depth, mm	0				
Surface temperature (°C)	45				
Chamber temperature (°C)	34				
Ambient temperature (°C)	36				
Oxygen (%VM)	1.4				
Carbon Dioxide (%VM)	16.3				
Hydrogen sulfide, ppm	0.2				



2.2 Event 2 - Pile 2

Client		Test Location	
Advanced Composting Technologies of Australasia Pty Ltd		Pile 2 - Green Waste - Aged 2+ weeks	
Date		Location & State	
28/02/2017		Bannockburn, VIC	
Report No.		Ektime Staff	
R004009		Greg Conway	
Test Location Details			
GPS co-ordinates	36°23'7"S, 144°8'16"E		
Location Description	South-western side of stockyard		
Surface Description	Green waste, compost mixture & actuator		
Area Classification	Agricultural		
Source dimensions (LxWxH), m	6x6x2.2		
Source area, m ²	45		
Sampling Method	AS4323.4 (Flux)		
Sampling Results		Test 1	Test 2
Sampling time, hrs		1155 - 1206	1207 - 1220
Sample dilution		1	1
Odour concentration, ou		760	960
Hedonic tone		neutral	neutral
Odour character		compost	compost
Average Odour Concentration, ou		870	
Odour Flux Rate, ou/m ² /min		29	
Odour mass rate, ou/min		1300	
Flux Testing Parameters			
Equilibration time, hrs		1119 - 1155	
Sweep Rate, L/min		5.00	
Penetration Depth, mm		0	
Surface temperature (°C)		45	
Chamber temperature (°C)		45	
Ambient temperature (°C)		33	



2.3 Event 3 - Pile 2

Client	Advanced Composting Technologies of Australasia Pty Ltd		Test Location	Pile 2 -Green Waste - Agard 5 weeks
Date	14/03/2017			
Report No.	R004009		Location & State	Bagnockburn, VIC
Ektimo Staff	Greg Scarsay			
Test Location Details				
GPS co-ordinates	38°2'37"S, 144°6'16"E			
Location Description	South-western side of stockyard			
Surface Description	Green waste, compost mixture & activator			
Area Classification	Agricultural			
Source dimensions (LxWxH), m	6x2			
Source area, m²	43			
Sampling Method	AS4323.4 (Flux)			
Sampling Results				
	Test 1		Test 2	
Sampling time, hrs	1331 - 1341		1342 - 1352	
Sample dilution	1		1	
Odour concentration, ou	1400		1200	
Hedonic tone	mildly unpleasant		mildly unpleasant	
Odour character	compost		compost	
Average Odour Concentration, ou			1300	
Odour Flux Rate, ou/m²/min			43	
Odour mass rate, ou/min			1800	
Flux Testing Parameters				
Equilibration time, hrs	1304 - 1330			
Sweep Rate, L/min	5.01			
Penetration Depth, mm	17			
Surface temperature (°C)	60			
Chamber temperature (°C)	45			
Ambient temperature (°C)	33			



4 PLANT OPERATING CONDITIONS

Unless otherwise stated, the plant operating conditions were normal at the time of testing. See Advanced Composting Technologies of Australasia Pty Ltd's records for complete process conditions.

5 TEST METHODS

All sampling and analysis was performed by Ektimo unless otherwise specified. Specific details of the methods are available upon request.

Parameter	Sampling Method	Uncertainty*	NATA Accredited	
			Sampling	Analysis
Temperature	ISO 10780	8%, 2%, 7%	✓	NA
Oxygen	USEPA 3A	1.3%	✓	✓
Odeur flux	AS4323.4	Analyte specific	✓	✓
Hydrogen sulfide	Ektimo (ETC) 500	not specified	✗	✗

* Uncertainty values cited in this table are calculated at the 95% confidence level (coverage factor = 2)

6 QUALITY ASSURANCE/ QUALITY CONTROL INFORMATION

Ektimo (EML) and Ektimo (ETC) are accredited by the National Association of Testing Authorities (NATA) for the sampling and analysis of air pollutants from industrial sources. Unless otherwise stated test methods used are accredited with the National Association of Testing Authorities. For full details, search for Ektimo at NATA's website www.nata.com.au

Ektimo (EML) and Ektimo (ETC) are accredited by NATA (National Association of Testing Authorities) to ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories. ISO/IEC 17025 requires that a laboratory have adequate equipment to perform the testing, as well as laboratory personnel with the competence to perform the testing. This quality assurance system is administered and maintained by the Compliance Manager.

NATA is a member of APLAC (Asia Pacific Laboratory Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through the mutual recognition arrangements with both of these organisations, NATA accreditation is recognised world-wide.

A formal Quality Control program is in place at Ektimo to monitor analyses performed in the laboratory and sampling conducted in the field. The program is designed to check where appropriate; the sampling reproducibility, analytical method, accuracy, precision and the performance of the analyst. The Laboratory Manager is responsible for the administration and maintenance of this program.



7 DEFINITIONS

The following symbols and abbreviations may be used in this test report:

STP	Standard temperature and pressure. Gas volumes and concentrations are expressed on a dry basis at 0°C, at discharge oxygen concentration and an absolute pressure of 101.325 kPa, unless otherwise specified.
Disturbance	A flow obstruction or instability in the direction of the flow which may impede accurate flow determination. This includes centrifugal fans, axial fans, partially closed or closed dampers, louvres, bends, connections, junctions, direction changes or changes in pipe diameter.
VOC	Any chemical compound based on carbon with a vapour pressure of at least 0.010 kPa at 25°C or having a corresponding volatility under the particular conditions of use. These compounds may contain oxygen, nitrogen and other elements, but specifically excluded are carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonate salts.
TOC	The sum of all compounds of carbon which contain at least one carbon to carbon bond, plus methane and its derivatives.
OU	The number of odour units per unit of volume. The numerical value of the odour concentration is equal to the number of dilutions to arrive at the odour threshold (50% panel response).
PM_{2.5}	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 2.5 microns (µm).
PM₁₀	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 10 microns (µm).
BSP	British standard pipe
NT	Not tested or results not required
NA	Not applicable
D₅₀	'Cut size' of a cyclone defined as the particle diameter at which the cyclone achieves a 50% collection efficiency (i.e. half of the particles are retained by the cyclone and half are not and pass through it to the next stage). The D ₅₀ method simplifies the capture efficiency distribution by assuming that a given cyclone stage captures all of the particles with a diameter equal to or greater than the D ₅₀ of that cyclone and less than the D ₅₀ of the preceding cyclone.
D	Duct diameter or equivalent duct diameter for rectangular ducts
<	Less than
>	Greater than
≥	Greater than or equal to
≈	Approximately
CEM	Continuous Emission Monitoring
CEMS	Continuous Emission Monitoring System
DER	WA Department of Environment & Regulation
DECC	Department of Environment & Climate Change (NSW)
EPA	Environment Protection Authority
FTIR	Fourier Transform Infra Red
NATA	National Association of Testing Authorities
RATA	Relative Accuracy Test Audit
AS	Australian Standard
USEPA	United States Environmental Protection Agency
Vic EPA	Victorian Environment Protection Authority
ISC	Intersociety committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
APHA	American public health association, Standard Methods for the Examination of Water and Waste Water
CARB	Californian Air Resources Board
TM	Test Method
OM	Other approved method
CTM	Conditional test method
VDI	Verein Deutscher Ingenieure (Association of German Engineers)
NIOSH	National Institute of Occupational Safety and Health
XRD	X-ray Diffractometry

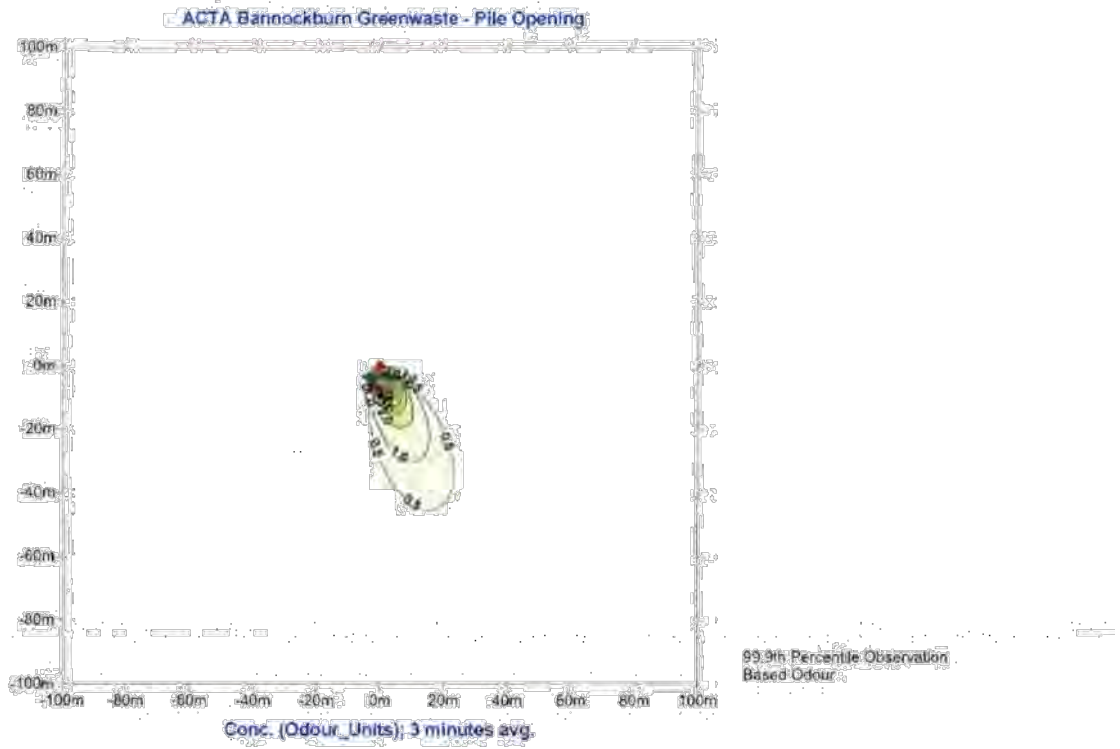


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APPENDIX 2

AUSPLUME ODOUR EMISSION ESTIMATION
FRESHLY EXPOSED COMPOST

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ACTA HANNOCKBURN GREENWASTE - PILE OPENING

CONCENTRATION OR DEPOSITION CONCENTRATION
 EMISSION RATE UNITS OUV/SECOND
 CONCENTRATION UNITS OOUR UNITS
 UNITS CONVERSION FACTOR 1.00E+00
 CONSTANT BACKGROUND CONCENTRATION 0.00E+00
 TERRAIN EFFECTS NONE
 SMOOTH STABILITY CLASS CHANGES? No
 OTHER STABILITY CLASS ADJUSTMENTS ("URBAN MODES") NONE
 IGNORE BUILDING WAKE EFFECTS? No
 DECAY COEFFICIENT (UNLESS OVERRIDDEN BY MET. FILE) 0.000
 ANEMOMETER HEIGHT 2-M
 ROUGHNESS HEIGHT AT THE WIND VANE SITE 0.300 M
 USE THE CONVECTIVE PDF ALGORITHM? No

DISPERSION CURVES

HORIZONTAL DISPERSION CURVES FOR SOURCES <100M HIGH PASQUILL-GIFFORD
 VERTICAL DISPERSION CURVES FOR SOURCES <100M HIGH PASQUILL-GIFFORD
 HORIZONTAL DISPERSION CURVES FOR SOURCES >100M HIGH BRIGGS RURAL
 VERTICAL DISPERSION CURVES FOR SOURCES >100M HIGH BRIGGS RURAL
 ENHANCE HORIZONTAL PLUME SPREADS FOR BUOYANCY? YES
 ENHANCE VERTICAL PLUME SPREADS FOR BUOYANCY? YES
 ADJUST HORIZONTAL P-G FORMULAE FOR ROUGHNESS HEIGHT? YES
 ADJUST VERTICAL P-G FORMULAE FOR ROUGHNESS HEIGHT? YES
 ROUGHNESS HEIGHT 0.100M
 ADJUSTMENT FOR WIND DIRECTIONAL SHEAR NONE

PLUME RISE OPTIONS

GRADUAL PLUME RISE? YES
 STACK TIP DOWNWASH INCLUDED? YES
 BUILDING DOWNWASH ALGORITHM: PRIME METHOD.
 ENTRAINMENT COEFF. FOR NEUTRAL & STABLE LAPSE RATES 0.60, 0.60
 PARTIAL PENETRATION OF ELEVATED INVERSIONS? No
 DISREGARD TEMP. GRADIENTS IN THE HOURLY MET. FILE? No

AND IN THE ABSENCE OF BOUNDARY-LAYER POTENTIAL TEMPERATURE GRADIENTS
 GIVEN BY THE HOURLY MET. FILE, A VALUE FROM THE FOLLOWING TABLE
 (IN K/M) IS USED:

WIND SPEED CATEGORY	STABILITY CLASS					
	A	B	C	D	E	F
1	0.000	0.000	0.000	0.000	0.020	0.035
2	0.000	0.000	0.000	0.000	0.020	0.035
3	0.000	0.000	0.000	0.000	0.020	0.035
4	0.000	0.000	0.000	0.000	0.020	0.035
5	0.000	0.000	0.000	0.000	0.020	0.035
6	0.000	0.000	0.000	0.000	0.020	0.035

WIND SPEED CATEGORIES

BOUNDARIES BETWEEN CATEGORIES (IN M/S) ARE: 1.54, 3.09, 5.14, 8.23, 10.80

WIND PROFILE EXPONENTS: "IRWIN URBAN" VALUES (UNLESS OVERRIDDEN BY MET. FILE)

AVERAGING TIME: 3 MINUTES.

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1

ACTIA BARROCKBURN GREENWASTE - PILE OPENING

SOURCE CHARACTERISTICS

VOLUME SOURCE: OPENIG

X (M)	Y (M)	GROUND ELEVATION DM	HEIGHT IN	HOR. SPREAD IN	VERT. SPREAD IN
0	0	0	0	0	0

(CONSTANT) EMISSION RATE = 3.00E+02 OUV/SECOND
 NO GRAVITATIONAL SETTLING OR SCAVENGING

1

ACTIA BARROCKBURN GREENWASTE - PILE OPENING

RECEPTOR LOCATIONS

THE CARTESIAN RECEPTOR GRID HAS THE FOLLOWING X-VALUES (OR EASTINGS):

-100.M	-95.M	-90.M	-85.M	-80.M	-75.M	-70.M
-65.M	-60.M	-55.M	-50.M	-45.M	-40.M	-35.M
-30.M	-25.M	-20.M	-15.M	-10.M	-5.M	0.M
5.M	10.M	15.M	20.M	25.M	30.M	35.M
40.M	45.M	50.M	55.M	60.M	65.M	70.M
75.M	80.M	85.M	90.M	95.M	100.M	

AND THESE Y-VALUES (OR NORTHINGS):

-100.M	-95.M	-90.M	-85.M	-80.M	-75.M	-70.M
-65.M	-60.M	-55.M	-50.M	-45.M	-40.M	-35.M
-30.M	-25.M	-20.M	-15.M	-10.M	-5.M	0.M
5.M	10.M	15.M	20.M	25.M	30.M	35.M
40.M	45.M	50.M	55.M	60.M	65.M	70.M
75.M	80.M	85.M	90.M	95.M	100.M	

METEOROLOGICAL DATA : METEOROLOGICAL FILE

1

PEAK VALUES FOR THE 100 WORST CASES (IN ODOUR UNITS)

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AVERAGING TIME = 3 MINUTES

RAIN	VALUE	TIME RECORDED HOUR, DATE	COORDINATES (* DENOTES POLAR)
1	8.97E+00	01,28/02/17	(0, -5, 0.0)
2	8.97E+00	02,28/02/17	(0, -5, 0.0)
3	8.97E+00	03,28/02/17	(0, -5, 0.0)
4	8.97E+00	04,28/02/17	(0, -5, 0.0)
5	8.97E+00	05,28/02/17	(0, -5, 0.0)
6	8.97E+00	06,28/02/17	(0, -5, 0.0)
7	8.97E+00	07,28/02/17	(0, -5, 0.0)
8	8.97E+00	08,28/02/17	(0, -5, 0.0)
9	8.97E+00	09,28/02/17	(0, -5, 0.0)
10	8.97E+00	10,28/02/17	(0, -5, 0.0)
11	8.97E+00	11,28/02/17	(0, -5, 0.0)
12	8.97E+00	12,28/02/17	(0, -5, 0.0)
13	8.97E+00	13,28/02/17	(0, -5, 0.0)
14	8.97E+00	14,28/02/17	(0, -5, 0.0)
15	8.97E+00	15,28/02/17	(0, -5, 0.0)
16	8.97E+00	16,28/02/17	(0, -5, 0.0)
17	8.97E+00	17,28/02/17	(0, -5, 0.0)
18	8.97E+00	18,28/02/17	(0, -5, 0.0)
19	8.97E+00	19,28/02/17	(0, -5, 0.0)
20	8.97E+00	20,28/02/17	(0, -5, 0.0)
21	8.97E+00	21,28/02/17	(0, -5, 0.0)
22	8.97E+00	22,28/02/17	(0, -5, 0.0)
23	8.97E+00	23,28/02/17	(0, -5, 0.0)
24	8.97E+00	24,28/02/17	(0, -5, 0.0)

WIND DIRECTION	WIND	WIND	WIND
17101901 10	1.1	315	B 100
17101902 10	1.1	315	B 100
17101903 10	1.1	315	B 100
17101904 10	1.1	315	B 100
17101905 10	1.1	315	B 100
17101906 10	1.1	315	B 100
17101907 10	1.1	315	B 100
17101908 10	1.1	315	B 100
17101909 10	1.1	315	B 100
17101910 10	1.1	315	B 100
17101911 10	1.1	315	B 100
17101912 10	1.1	315	B 100
17101913 10	1.1	315	B 100
17101914 10	1.1	315	B 100
17101915 10	1.1	315	B 100
17101916 10	1.1	315	B 100
17101917 10	1.1	315	B 100
17101918 10	1.1	315	B 100
17101919 10	1.1	315	B 100
17101920 10	1.1	315	B 100
17101921 10	1.1	315	B 100
17101922 10	1.1	315	B 100
17101923 10	1.1	315	B 100

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18

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APPENDIX 3

**GREEN WASTE COMPOSTING SITE HIGHEST AND 9TH HIGHEST
ODOUR HIGHEST CONTOUR PLOTS**

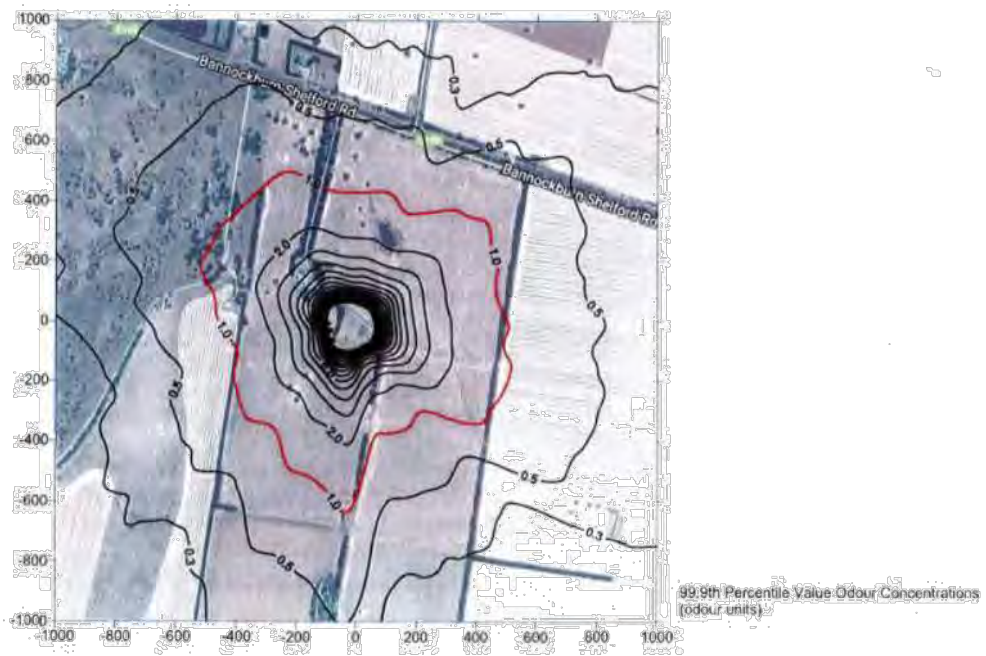
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ACTA Bannockburn Greenwaste Composting Odour Modelling
2012 Meteorological File

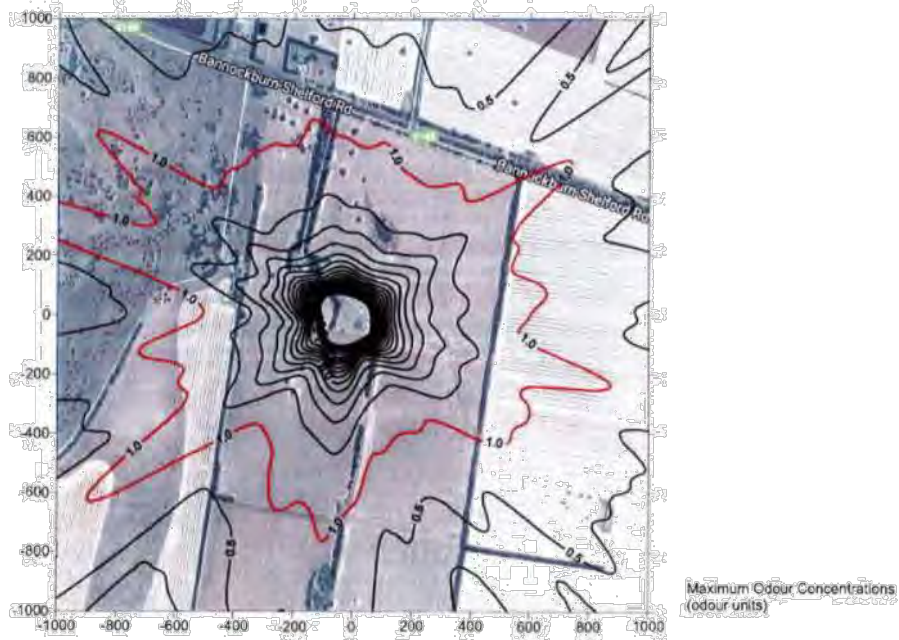


ACTA Bannockburn Greenwaste Composting Odour Modelling
2012 Meteorological File

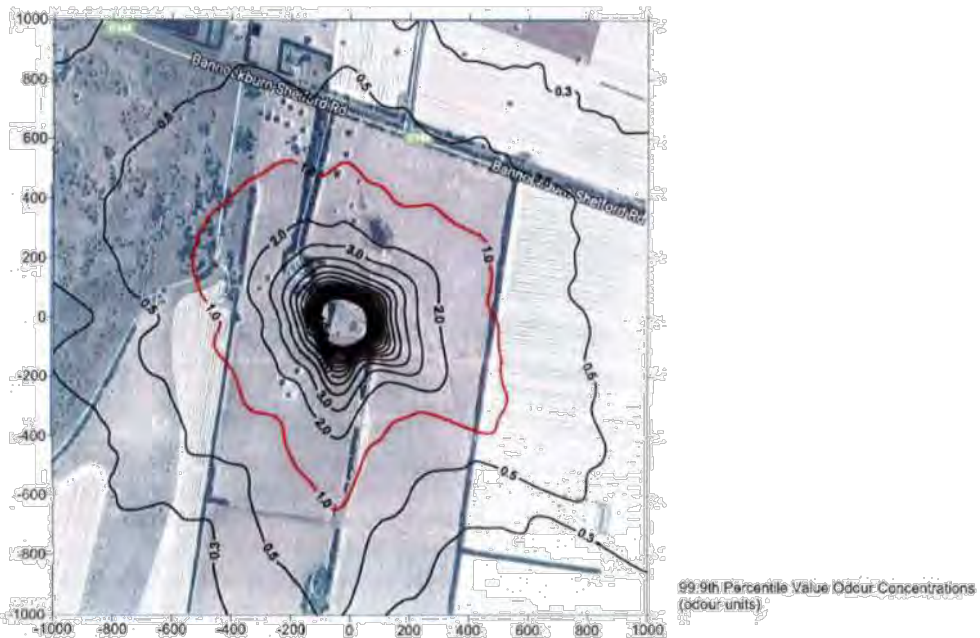


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**ACTA Bannockburn Greenwaste Composting Odour Modelling
2013 Meteorological File**

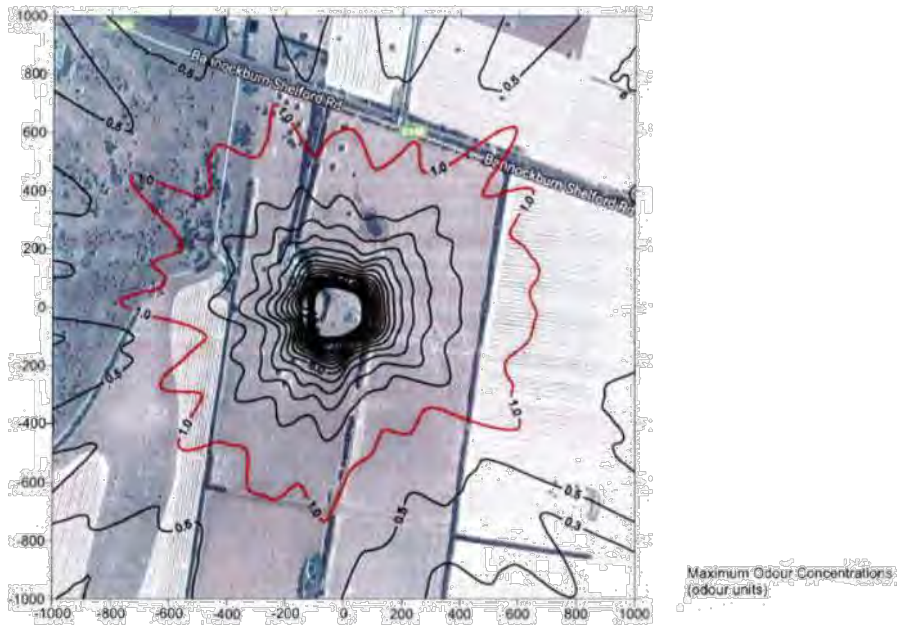


**ACTA Bannockburn Greenwaste Composting Odour Modelling
2013 Meteorological File**

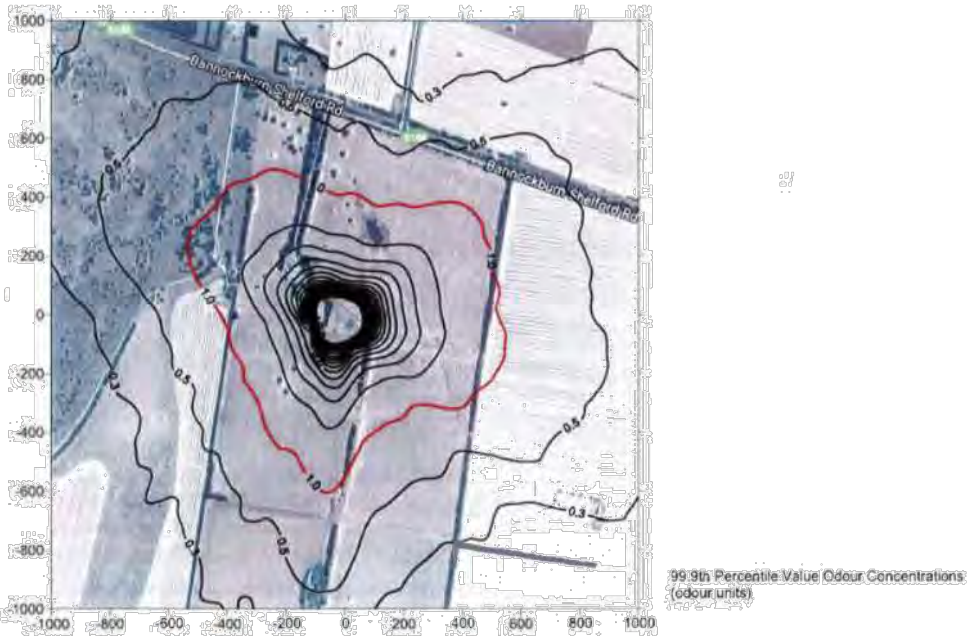


V&C ENVIRONMENT CONSULTANTS PTY LTD

ACTA Bannockburn Greenwaste Composting Odour Modelling
2014 Meterological File

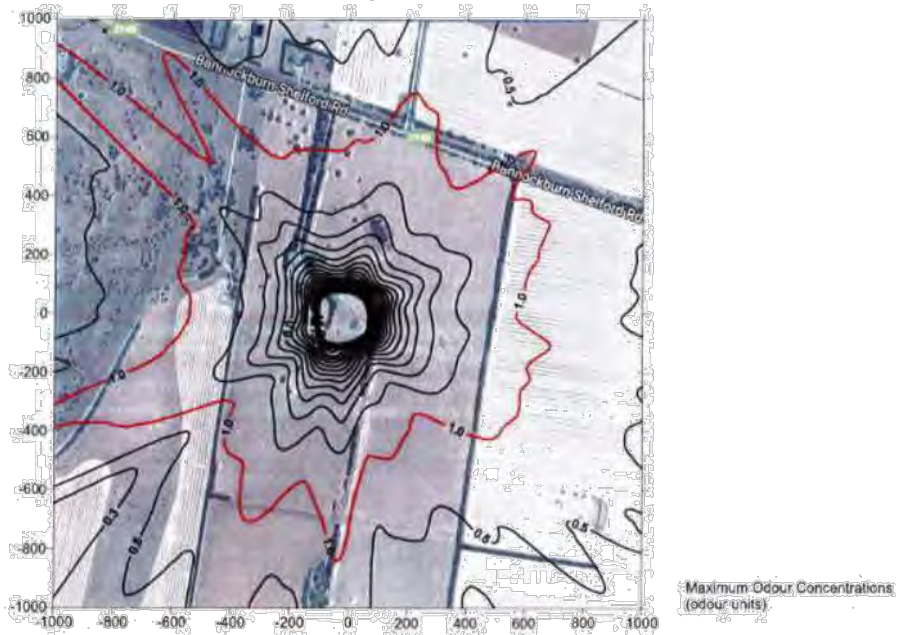


ACTA Bannockburn Greenwaste Composting Odour Modelling
2014 Meterological File

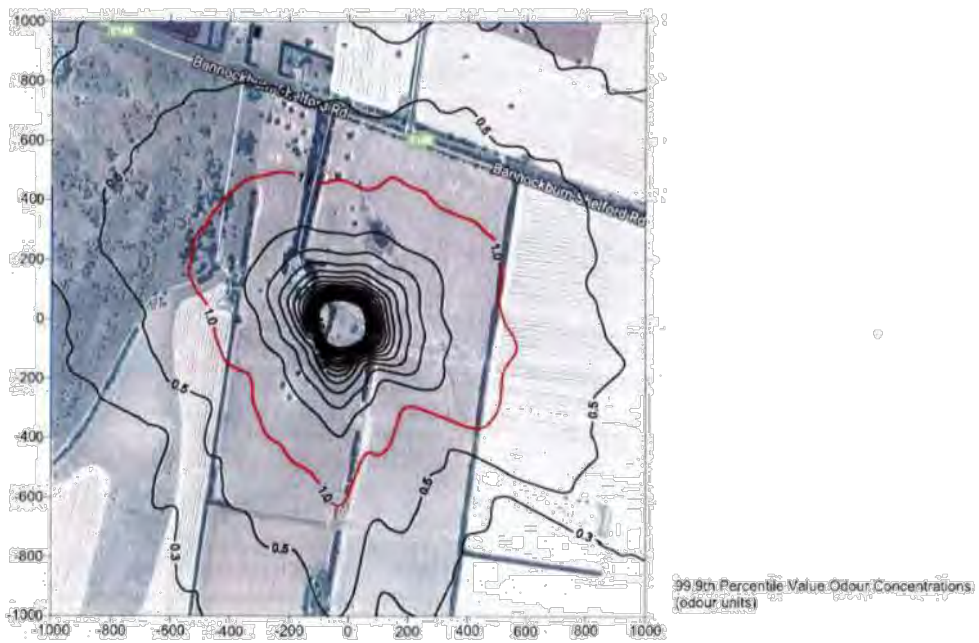


V&C ENVIRONMENT CONSULTANTS PTY LTD

ACTA Bannockburn Greenwaste Composting Odour Modelling
2015 Meteorological File

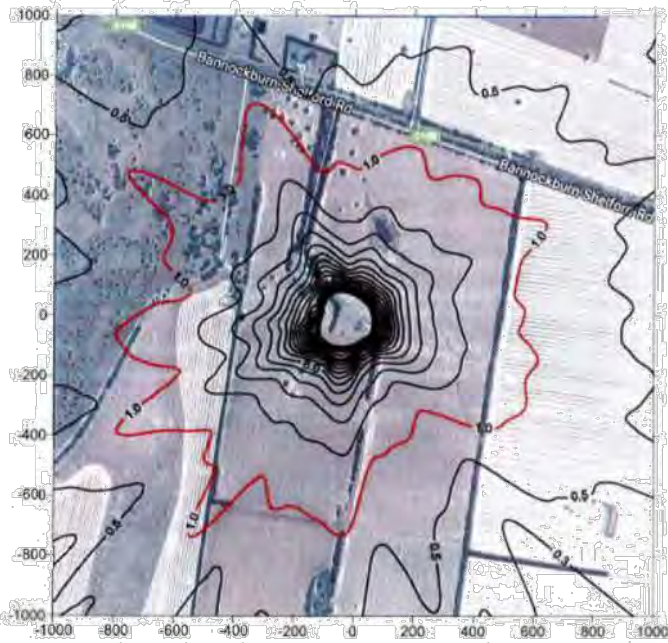


ACTA Bannockburn Greenwaste Composting Odour Modelling
2015 Meteorological File



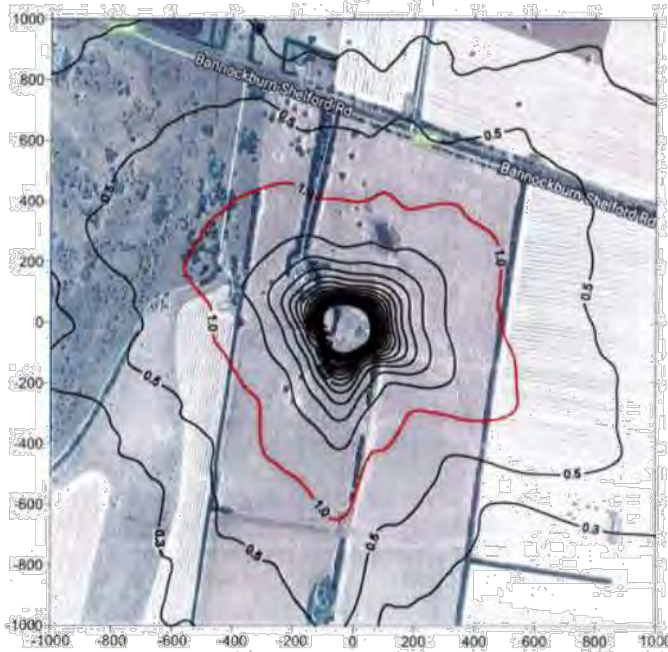
V&C ENVIRONMENT CONSULTANTS PTY LTD

ACTA Bannockburn Greenwaste Composting Odour Modelling
2016 Meteorological File



Highest Odour Concentrations
(ou/units)

ACTA Bannockburn Greenwaste Composting Odour Modelling
2016 Meteorological File



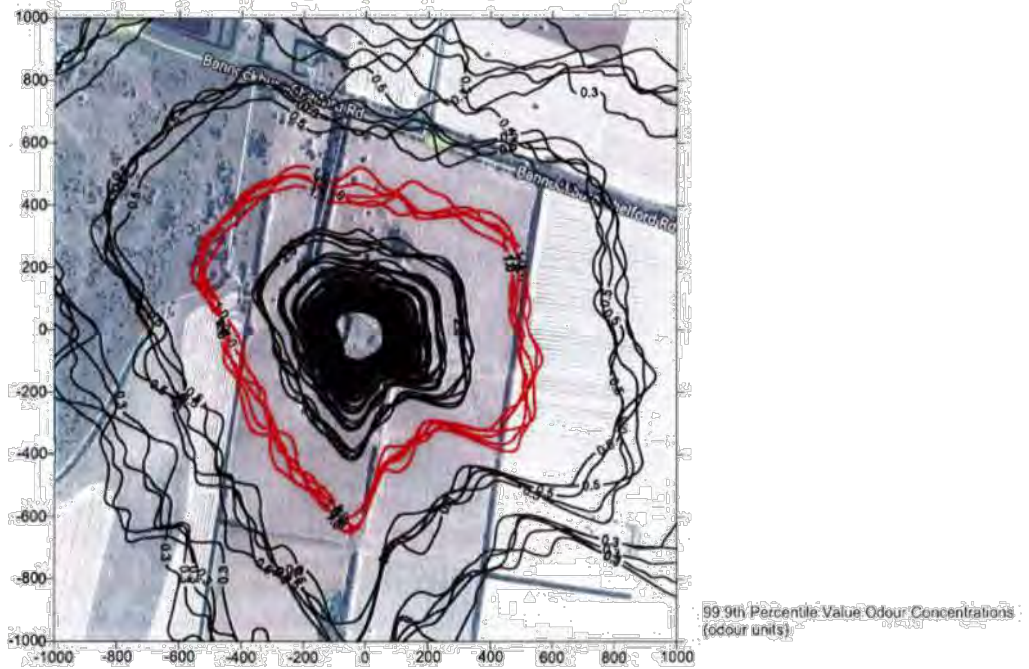
99.9th Percentile Value Odour Concentrations
(ou/units)

V&C ENVIRONMENT CONSULTANTS PTY LTD

ACTA Bannockburn Greenwaste Composting Odour Modelling
2012 - 2016 Meterological File Comparison



ACTA Bannockburn Greenwaste Composting Odour Modelling
2012 - 2016 Meterological File Comparison



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APPENDIX 4

**DRAFT EKTIMO EMISSION TEST REPORT
HIGHLY ODOROUS WASTE COMPOST PILE
FLUX HOOD TEST RESULTS**



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⊞



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Report Number R004009-1r [DRAFT]

Emission Testing Report
Bannockburn Project 2017
Advanced Composting Technologies of Australasia Pty Ltd

DRAFT

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 Attention: Simon Atkinson
 Address: PO Box 489
 Meadows SA 5201
 Testing Laboratory: Ektimo (ETC) ABN 74 474 273 172

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Preliminary Report					
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Revised Report					

Template Version: 170714

Amendment Record

Document Number	Initiate	Report Date	Section	Reason
R004009-1	Simon Atkinson	8/08/2017	2 - Results	Morts results were removed from report

Report Authorisation



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NATA Accredited Laboratory
No. 2732

Glenn Trenear
Ektimo Signatory

Accredited for compliance with ISO/IEC 17025. NATA is a signatory to the ILAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.



Table of Contents

1. Executive Summary 4

2. Results 5

 2.1. Event 1 – Grease Trap – Fresh 6

 2.2. Event 2 – Grease Trap – 2+ Weeks 6

 2.3. Event 2 – Abattoir – Fresh 7

 2.4. Event 2 – Hatchery – Fresh 8

 2.5. Event 3 – Abattoir – 2 Weeks 9

 2.6. Event 3 – Hatchery – 2 Weeks 10

 2.7. Event 4 – Grease Trap – 17 Weeks 11

 2.8. Event 4 – Abattoir – 15 Weeks 12

 2.9. Event 4 – Hatchery – 15 Weeks 13

3. Plant Operating Conditions 14

4. Test Methods 14

5. Quality Assurance/ Quality Control Information 14

6. Definitions 15



1 EXECUTIVE SUMMARY

Ektimo was engaged by Advanced Composting Technologies of Australasia Pty Ltd to perform odour monitoring of piles of waste materials (Grease Trap, Abattoir & Chicken Hatchery) mixed into dried compost material. The odour monitoring program was performed over four test events commencing in February and concluding in July 2017. Test dates are shown in the table below.

The "Grease Trap" waste pile was first prepared over 2 weeks ahead of the pile preparation for the other 2 waste materials.

Replicate odour samples obtained by isolation flux hood method were analysed for odour level by presentation to a panel of pre-screened members of the public. Odour results in odour units (OU) for each event date are included in the results section in the order shown in the table of contents.

Monitoring was performed as follows:

Event	Waste Type / Age	Pile	Test Date	Primary Test Parameter
Event 1	Grease Trap - Fresh	Pile 1	9 February 2017	Odour Flux
Event 2	Grease Trap - 2+ weeks *	Pile 1	28 February 2017	
	Abattoir - Fresh	Pile 4		
	Hatchery - Fresh	Pile 5		
Event 3	Abattoir - 2 Weeks *	Pile 4	14 March 2017	
	Hatchery - 2 Weeks	Pile 5		
Event 4	Grease Trap - 17 Weeks	Pile 1	14 June 2017	
	Abattoir - 15 Weeks	Pile 4		
	Hatchery - 15 Weeks	Pile 5		

The methodologies chosen by Ektimo are those recommended by the Victorian Environment Protection Authority (as specified in *A Guide to Sampling and Analysis of Air Emissions and Air Quality, December 2002*).

All results are reported on a dry basis at STP (except odour wet - STP). Unless otherwise indicated, the methods cited in this report have been performed without deviation.

* Gas analyser spot readings for oxygen, carbon dioxide and hydrogen sulphide were recorded for event 2 grease trap waste pile and event 3 abattoir waste pile. Refer to relevant results tables.



2 RESULTS

2.1 Event 1 - Grease Trap - Fresh

Client	Advanced Composting Technologies of Australasia Pty Ltd	Test Location	Pile 1 - Fresh Grease Trap
Date	8/2/2017		
Report No.	R004009		Bannockburn, VIC
Ekimo Staff	Bronson Stoneham & Greg Sweeney		
Test Location Details			
Location Description:	South-Western Side of Stockyard		
Surface Description:	Grease trap waste, compost mixture & activator		
Area Classification:	Agricultural		
Source dimensions (LxWxH), m	15 x 5.5 x 2.5		
Source area, m²	119		
Sampling Method	AS4323.4 (Flux)		
Sampling Results		Test 1	Test 2
Sampling time, hrs	1227 - 1235	1245 - 1253	
Sample dilution	1	1	
Odour concentration, ou	3900	4500	
Hedonic tone	mildly unpleasant	mildly unpleasant	
Odour character	compost, fertiliser, stale air, cabbage	compost, fertiliser, stale air, cabbage	
Average Odour Concentration, ou	4200		
Odour Flux Rate, ou/m²/min	140		
Odour mass rate, ou/min	17000		
Flux Testing Parameters			
Equilibration time, hrs	1148 - 1224		
Sweep Rate, L/min	4.39		
Penetration Depth, mm	2		
Surface temperature (°C)	47		
Chamber temperature (°C)	38		
Ambient temperature (°C)	37		



2.2 Event 2 - Grease Trap 2+ Weeks

Client	Advanced Composting Technologies of Australasia Pty Ltd	Test Location	Plot 11 - Grease Trap - Aged 2+ Weeks
Date	28/02/2017		
Report No.	R004009		Bannekeum, VIC
Ektimo Staff	Greg Scenway		
Test Location Details			
GPS co-ordinates	38°23'7"S - 144°16'16"E		
Location Description	South-Western Side of Stockyard		
Surface Description	Composting greenwaste covering mixture of grease trap waste, green waste & activator		
Area Classification	Agricultural		
Source dimensions (LxWxH), m	16x5.5x2.5		
Source area, m²	119		
Sampling Method	AS4323.4 (Flux)		
Sampling Results			
	Test 1	Test 2	
Sampling time, hrs	1045 - 1055	1056 - 1106	
Sample dilution	1	1	
Odour concentration, ou	360	420	
Hedonic tone	mildly unpleasant	mildly unpleasant	
Odour character	meat, fat	meat, fat	
Average Odour Concentration, ou	390		
Odour Flux Rate, ou/m²/min	13		
Odour mass rate, ou/min	1600		
Flux Testing Parameters			
Equilibration time, hrs	1002 - 1045		
Sweep Rate, L/min	4.32		
Penetration Depth, mm	7		
Surface temperature (°C)	47		
Chamber temperature (°C)	45		
Ambient temperature (°C)	29		
Gas Analyser Readings			
Oxygen (%V/V)	7.7		
Carbon Dioxide (%V/V)	12.9		
Hydrogen Sulfide (ppm)	0.06		



2.3 Event 2 - Abattoir - Fresh

Client	Advanced Composting Technologies of Australasia Pty Ltd	Test Location	Plot 4 - Fresh Abattoir Waste
Date	28/02/2017		
Report No.	R004009		Bennockburn, VIC
Ektimo Staff	Greg Sceneay		
Test Location Details			
GPS co-ordinates	38°23'7"S 144°6'18"E		
Location Description	North west side of stockyard		
Surface Description	Fresh abattoir waste, compost mixture & activator		
Area Classification	Agricultural		
Source dimensions (LxWxH), m	16 x 5.5 x 3		
Source area, m²	130		
Sampling Method	AS4323.4 (Flux)		
Sampling Results		Test 1	Test 2
Sampling time, hrs		1439 - 1451	1452 - 1502
Sample dilution		1	1
Odour concentration, ou		1800	2000
Hedonic tone		very unpleasant	very unpleasant
Odour character		meat, rancid	meat, rancid
Average Odour Concentration, ou		1900	
Odour Flux Rate, ou/m²/min		62	
Odour mass rate, ou/min		8100	
Flux Testing Parameters			
Equilibration time, hrs		1405 - 1438	
Sweep Rate, l/min		4.29	
Penetration Depth, mm		72	
Static Pressure, Pa		0	
Surface temperature (°C)		46	
Chamber temperature (°C)		46	
Ambient temperature (°C)		33	



2.4 Event 2 - Hatchery - Fresh

Client	Advanced Composting Technologies of Australasia Pty Ltd	Test Location	Pile 5 - Fresh Hatchery Waste
Date	28/02/2017		
Report No.	R004009		Barraboolm, VIC
Ektimo Staff	Greg Scerway		
Test Location Details			
GPS co-ordinates	38°23'5" S, 144°16'16"E		
Location Description	North west side of stockyard		
Surface Description	Fresh chicken hatchery waste, compost mixture & activator		
Area Classification	Agricultural		
Source dimensions (LxWxH), m	19.5x5x3		
Source area, m²	152		
Sampling Method	AS4323.4 (Flux)		
Sampling Results			
Sampling time, hrs	Test 1 1530 - 1542	Test 2 1543 - 1555	
Sample dilution	1	1	
Odour concentration, ou	3300	2200	
Hedonic tone	mildly unpleasant	mildly unpleasant	
Odour character	grain, rubbish	grain, rubbish	
Average Odour Concentration, ou	2700		
Odour Flux Rate, ou/m²/min	92		
Odour mass rate, ou/min	14000		
Flux Testing Parameters			
Equilibration time, hrs	1505 - 1530		
Sweep Rate, L/min	4.37		
Penetration Depth, mm	2		
Static Pressure, Pa	0		
Surface temperature (°C)	44		
Chamber temperature (°C)	44		
Ambient temperature (°C)	34		



2.5 Event 3 - Abattoir - 2 Weeks

Client		Test Location	
Advanced Composting Technologies of Australasia Pty Ltd		Pile 4 - Abattoir Waste - Aged 2 weeks	
Date		14/3/2017	
Report No.		R004009	
Erroma Staff		Greg Scrimney	
Erroma Staff		Bennoboom, MC	
Test Location Details			
GPS co-ordinates	38°23'7"S, 144°16'16"E		
Location Description	North west side of stockyard		
Surface Description	Abattoir waste, compost mixture & activator		
Area Classification	Agricultural		
Source dimensions (L x W x H) m	16 x 5.5 x 3		
Source area, m ²	130		
Sampling Method	AS4323.4 (Flux)		
Sampling Results		Test 1	Test 2
Sampling time, hrs		11:10 - 11:21	11:26 - 11:38
Sample dilution		1	1
Odour concentration, ou		690	690
Hedonic tone		mildly unpleasant	mildly unpleasant
Odour character		fertiliser	fertiliser
Average Odour Concentration, ou		690	
Odour Flux Rate, ou/m ² /min		23	
Odour mass rate, ou/min		3000	
Penetration Depth, mm		7	
Static Pressure, Pa		30	
Surface temperature (°C)		65	
Chamber temperature (°C)		49	
Ambient temperature (°C)		30	
Gas Analyser Results			
Oxygen (%V/V)		0.3	
Carbon Dioxide (%V/V)		26.5	
Hydrogen Sulfide (ppm)		6	



2.6 Event 3 - Hatchery - 2 Weeks

Client: Advanced Composting Technologies of Australia Pty Ltd		Test Location: Site 5 - Hatchery Waste - Approx 2 weeks	
Date: 14/3/2017			
Report No.: R004009		Barrockburn, VIC	
Ektimo Staff: Greg Scarsley			
Test Location Details			
GPS co-ordinates:		38°23' S; 144°6' 18" E	
Location Description:		North west side of stockyard	
Surface Description:		Hatchery waste, compost mixture & activator	
Area Classification:		Agricultural	
Source dimensions (LxWxH), m:		19.5 x 5 x 3	
Source area, m²:		152	
Sampling Method:		AS4323.4 (Flux)	
Sampling Results		Test 1	Test 2
Sampling time, hrs:		1223 - 1234	1235 - 1247
Sample dilution:		1	1
Odour concentration, ou:		3900	4300
Hedonic tone:		very unpleasant	very unpleasant
Odour character:		animal waste	animal waste
Average Odour Concentration, ou		4100	
Odour Flux Rate, ou/m²/min		140	
Odour mass rate, ou/min		21000	
Flux Testing Parameters			
Equilibration time, hrs:		1155 - 1220	
Sweep Rate, L/min:		4.28	
Penetration Depth, mm:		7	
Static Pressure, Pa:		0	
Surface temperature (°C):		16	
Chamber temperature (°C):		48	
Ambient temperature (°C):		29	



Ekimo 17 August 2017

2.7 Event 4 - Grease Trap - 17 Weeks

Client: Advanced Composting Technologies of Australasia Pty Ltd		Test Location: 776 - Grease Trap - Area 17 - 18000	
Date: 14/08/2017		Barrabool, VIC	
Report No: R004009		Barrabool, VIC	
Testing Staff: Greg Denton			
Test Location Details			
GPS co-ordinates	38°23'7"S, 144°0'18"E		
Location Description	North west side of stockyard		
Surface Description	Grease trap waste, compost mixture & activator		
Area Classification	Agricultural		
Source dimensions (LxWxH), m	16 x 5 x 1.8		
Source area, m ²	89		
Sampling Method	AS4323.4 (Flux)		
Sampling Results			
Sampling time, hrs	Test 1: 1242 - 1249	Test 2: 1250 - 1259	
Sample dilution	1	1	
Odour concentration, ou	140	100	
Hedonic tone	moderately unpleasant	moderately unpleasant	
Odour character	fat	fat	
Average Odour Concentration, ou	180		
Odour Flux Rate, ou/m ² /min	6.9		
Odour mass rate, ou/min	580		
Flux Testing Parameters			
Equilibration time, hrs	1215 - 1241		
Sweep Rate, L/min	4.65		
Penetration Depth, mm	2		
Static Pressure, Pa	0		
Surface temperature (°C)	34		
Chamber temperature (°C)	26		
Ambient temperature (°C)	16		



2.8 Event 4 - Abattoir - 15 Weeks

Client: Advanced Composting Technologies of Australasia Pty Ltd		Test Location: Pits 4 - Abattoir Waste - Aged 15 weeks	
Date:	14/08/2017	Bannockburn, VIC	
Report No.:	R004000	Ektimo Staff: Greg Scoreray	
Test Location Details:			
GPS co-ordinates:	38°23'7"S - 144°6'16"E		
Location Description:	North west side of stockyard		
Surface Description:	Abattoir waste, compost mixture & activator		
Area Classification:	Agricultural		
Source dimensions (L x W x H), m:	18 x 5 x 2		
Source area, m ² :	90		
Sampling Method:	AS4323.4 (Flux)		
Sampling Results:			
Sampling time, hrs:	Test 1: 1039-1047	Test 2: 1005-1016	
Sample dilution:	1	1	
Odour concentration, ou:	280	360	
Reduction tone:	mildly unpleasant	mildly unpleasant	
Odour character:	dog food	dog food	
Average Odour Concentration, ou:	320		
Odour Flux Rate, ou/m ² /min:	12		
Odour mass rate, ou/min:	1200		
Flux Testing Parameters:			
Equilibration time, hrs:	1014-1039		
Sweep Rate, L/min:	4.66		
Penetration Depth, mm:	0		
Static Pressure, Pa:	0		
Surface temperature (°C):	25		
Chamber temperature (°C):	24		
Ambient temperature (°C):	14		



2.9 Event 4 - Hatchery - 15 Weeks

Client		Test Location	
Advanced Composting Technologies of Australasia Pty Ltd		Pile 5 - Hatchery Waste - Agad 15 weeks	
Date		14/08/2017	
Report No.		R004009	
Ektimo Staff		Greg Scerney	
Barnockburn, VIC			
Test Location Details			
GPS co-ordinates	38°23' S, 144°6' 16" E		
Location Description	North west side of stockyard		
Surface Description	Hatchery waste, compost mixture & activator		
Area Classification	Agricultural		
Source dimensions (L x W x H), m	10.5 x 4.5 x 2		
Source area, m ²	47		
Sampling Method	AS4323.4 (Flux)		
Sampling Results		Test 1	Test 2
Sampling time, hrs		1131 - 1139	1141 - 1151
Sample dilution		1	1
Odour concentration, ou		300	420
Hedonic tone		mildly unpleasant	mildly unpleasant
Odour character		compost, grass, faeces	compost, grass, faeces
Average Odour Concentration, ou		360	
Odour Flux Rate, ou/m ² /min		13	
Odour mass rate, ou/min		1500	
Penetration Depth, mm		7	
Static Pressure, Pa		0	
Surface temperature (°C)		19	
Chamber temperature (°C)		29	
Ambient temperature (°C)		16	



3. PLANT OPERATING CONDITIONS

Unless otherwise stated, the plant operating conditions were normal at the time of testing. See Advanced Composting Technologies of Australasia Pty Ltd's records for complete process conditions.

4. TEST METHODS

All sampling and analysis was performed by Ektimo unless otherwise specified. Specific details of the methods are available upon request.

Parameter	Sampling Method	Uncertainty*	NATA Accredited	
			Sampling	Analysis
Temperature	ISO 10780	8%, 2%, 7%	✓	NA
Carbon dioxide	USEPA 3A	13%	✓	✓
Oxygen	USEPA 3A	13%	✓	✓
Odour flux	AS4323.4	Analyte specific	✓	✓
Hydrogen sulfide	Ektimo (ETC) 500	not specified	✗	✗

* Uncertainty values cited in this table are calculated at the 95% confidence level (coverage factor = 2).

5. QUALITY ASSURANCE / QUALITY CONTROL INFORMATION

Ektimo (EML) and Ektimo (ETC) are accredited by the National Association of Testing Authorities (NATA) for the sampling and analysis of air pollutants from industrial sources. Unless otherwise stated test methods used are accredited with the National Association of Testing Authorities. For full details, search for Ektimo at NATA's website www.nata.com.au.

Ektimo (EML) and Ektimo (ETC) are accredited by NATA (National Association of Testing Authorities) to ISO/IEC 17025 - General Requirements for the Competence of Testing and Calibration Laboratories. ISO/IEC 17025 requires that a laboratory have adequate equipment to perform the testing, as well as laboratory personnel with the competence to perform the testing. This quality assurance system is administered and maintained by the Compliance Manager.

NATA is a member of APLAC (Asia Pacific Laboratory Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through the mutual recognition arrangements with both of these organisations, NATA accreditation is recognised world-wide.

A formal Quality Control program is in place at Ektimo to monitor analyses performed in the laboratory and sampling conducted in the field. The program is designed to check where appropriate, the sampling reproducibility, analytical method, accuracy, precision and the performance of the analyst. The Laboratory Manager is responsible for the administration and maintenance of this program.



DEFINITIONS

The following symbols and abbreviations may be used in this test report:

STP:	Standard temperature and pressure. Gas volumes and concentrations are expressed on a dry basis at 0°C, at discharge oxygen concentration and an absolute pressure of 101.325 kPa, unless otherwise specified.
Disturbance	A flow obstruction or instability in the direction of the flow which may impede accurate flow determination. This includes centrifugal fans, axial fans, partially closed or closed dampers, louvres, hoods, connections, junctions, direction changes or changes in pipe diameter.
VOC	Any chemical compound based on carbon with a vapour pressure of at least 0.010 kPa at 25°C or having a corresponding volatility under the particular conditions of use. These compounds may contain oxygen, nitrogen and other elements, but specifically excluded are carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonate salts.
TOC	The sum of all compounds of carbon which contain at least one carbon to carbon bond, plus methane and its derivatives.
OU	The number of odour units per unit of volume. The numerical value of the odour concentration is equal to the number of dilutions to arrive at the odour threshold (50% panel response).
PM _{2.5}	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 2.5 microns (µm).
PM ₁₀	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 10 microns (µm).
BSP	British standard pipe
NT	Not tested or results not required
NA	Not applicable
D ₅₀	'Cut size' of a cyclone defined as the particle diameter at which the cyclone achieves a 50% collection efficiency, i.e. half of the particles are retained by the cyclone and half are not and pass through it to the next stage. The D ₅₀ method simplifies the capture efficiency distribution by assuming that a given cyclone stage captures all of the particles with a diameter equal to or greater than the D ₅₀ of that cyclone and less than the D ₅₀ of the preceding cyclone.
D	Duct diameter or equivalent duct diameter for rectangular ducts
<	Less than
>	Greater than
≥	Greater than or equal to
≈	Approximately
CEM	Continuous Emission Monitoring
CEMS	Continuous Emission Monitoring System
DER	WA Department of Environment & Regulation
DECC	Department of Environment & Climate Change (NSW)
EPA	Environment Protection Authority
FTIR	Fourier Transform Infra Red
NATA	National Association of Testing Authorities
RATA	Relative Accuracy Test Audit
AS	Australian Standard
USEPA	United States Environmental Protection Agency
Vic EPA	Victorian Environment Protection Authority
ISC	Intersociety committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
APHA	American public health association, Standard Methods for the Examination of Water and Waste Water
CARB	Californian Air Resources Board
TM	Test Method
OM	Other approved method
ETM	Conditional test method
VDI	Verein Deutscher Ingenieure (Association of German Engineers)
NIOSH	National Institute of Occupational Safety and Health
XRD	X-ray Diffractometry





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Report Number R004009-1r

Emission Testing Report
Bannockburn Project 2017
Advanced Composting Technologies of Australasia Pty Ltd

Ektimo 5 March 2019

Document Information

Client Name: Advanced Composting Technologies of Australasia Pty Ltd
Report Number: R004009-1r
Date of Issue: 5 March 2019
Attention: Simon Atkinson
Address: PO Box 489
 Meadows SA 5201
Testing Laboratory: Ektimo (ETC) ABN 74 474 273 172

Report Status

Format	Document Number	Report Date	Prepared By	Reviewed By (1)	Reviewed By (2)
Preliminary Report					
Draft Report					
Final Report	R004009-1	8/08/2017	JWe	GSc	BSt
Draft Revised Report	R004009-1r(DRAFT1)	17/08/2017	JWe	GSc	BSt
Draft Revised Report 2	R004009-1r(DRAFT2)	27/02/2019	JWe	GSc	BSt
Revised Report	R004009-1r	5/03/2019	JWe	GSc	BSt
Amend Report					

Template Version: 170714

Amendment Record

Document Number	Initiator	Report Date	Section	Reason
R004009-1	Simon Atkinson	8/08/2017	2 - Results	Morts results were removed from report

Report Authorisation



Greg Sceneay
Ektimo Signatory



NATA Accredited Laboratory
No. 2732



Glenn Trenear
Ektimo Signatory

Accredited for compliance with ISO/IEC 17025. NATA is a signatory to the ILAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.



Report R004009-1r prepared for Advanced Composting Technologies of Australasia Pty Ltd

Page 2 of 18

1 EXECUTIVE SUMMARY

Ektimo was engaged by Advanced Composting Technologies of Australasia Pty Ltd to perform odour monitoring of piles of waste materials (Grease Trap, Chicken Morts, Abattoir & Chicken Hatchery) mixed into dried compost material. The odour monitoring program was performed over five test events commencing in February and concluding in July 2017. Test dates are shown in the table below.

The "Grease Trap" waste pile was first prepared over 2 weeks ahead of the pile preparation for the other 3 waste materials.

ACTA advice was the "Morts" waste pile was pulled apart and re-piled in mid-June. This activity was just prior to event 4 date so "Morts" waste pile testing was postponed until ACTA advised pile was ready.

Replicate odour samples obtained by isolation flux hood method were analysed for odour level by presentation to a panel of pre-screened members of the public. Odour results in odour units (OU) for each event date are included in the results section in the order shown in the table of contents.

Monitoring was performed as follows:

Event	Waste Type / Age	Pile	Test Date	Primary Test Parameter
Event 1	Grease Trap - Fresh	Pile 1	9 February 2017	Odour Flux
Event 2	Grease Trap - 2+ weeks *	Pile 1	28 February 2017	
	Morts - Fresh	Pile 3		
	Abattoir - Fresh	Pile 4		
	Hatchery - Fresh	Pile 5		
Event 3	Morts - 2 Weeks	Pile 3	14 March 2017	
	Abattoir - 2 Weeks *	Pile 4		
	Hatchery - 2 Weeks	Pile 5		
Event 4	Grease Trap - 17 Weeks	Pile 1	14 June 2017	
	Abattoir - 15 Weeks	Pile 4		
	Hatchery - 15 Weeks	Pile 5		
Event 5	Morts - 19 Weeks	Pile 3	25 July 2017	

The methodologies chosen by Ektimo are those recommended by the Victorian Environment Protection Authority (as specified in *A Guide to Sampling and Analysis of Air Emissions and Air Quality, December 2002*).

All results are reported on a dry basis at STP (except odour wet @ STP). Unless otherwise indicated, the methods cited in this report have been performed without deviation.

* Gas analyser spot readings for oxygen, carbon dioxide and hydrogen sulphide were recorded for event 2 grease trap waste pile and event 3 abattoir waste pile. Refer to relevant results tables.



2 RESULTS

2.1 Event 1 – Grease Trap – Fresh

Client	Advanced Composting Technologies of Aust		Test Location	File 1 - Fresh Grease Trap
Date	09/02/2017			
Report No.	R004009			Barnockburn, VIC
Ektimo Staff	Benson Stoneham & Greg Scouary			
Test Location Details				
Location Description	South-Western Side of Stockyard			
Surface Description	Grease trap waste, compost mixture & activator			
Area Classification	Agricultural			
Source dimensions (L x W x H), m	16 x 5.5 x 2.5			
Source area, m²	119			
Sampling Method	AS4323.4 (Flux)			
Sampling Results				
	Test 1		Test 2	
Sampling time, hrs	1227 - 1235		1245 - 1253	
Sample dilution	1		1	
Odour concentration, ou	3900		4500	
Hedonic tone	mildly unpleasant		mildly unpleasant	
Odour character	compost, fertiliser, stale air, cabbage		compost, fertiliser, stale air, cabbage	
Average Odour Concentration, ou	4200			
Odour Flux Rate, ou/m²/min	140			
Odour mass rate, ou/min	17000			
Flux Testing Parameters				
Equilibration time, hrs	1148 - 1224			
Sweep Rate, U/min	4.39			
Penetration Depth, mm	21			
Surface temperature (°C)	47			
Chamber temperature (°C)	39			
Ambient temperature (°C)	37			



2.2 Event 2 - Grease Trap 2+ Weeks

Client: Advanced Composting Technologies of Austr Test Location: Pile 1 - Grease Trap - Aged 2+ weeks		
Date: 28/02/2017		Plant/Site: []
Report No.: R004009		Barnoldburn, VIC
Ektimo Staff: Greg Scerney		
Test Location Details		
GPS co-ordinates	36°23'7"S, 144°6'16"E	
Location Description	South-Western Side of Stockyard	
Surface Description	Composting greenwaste covering mixture of grease trap waste, green waste & activator	
Area Classification	Agricultural	
Source dimensions (L x W x H), m	16 x 6.5 x 2.5	
Source area, m ²	119	
Sampling Method	AS4323.4 (Flux)	
Sampling Results		
	Test 1	Test 2
Sampling time, hrs	1045 - 1055	1056 - 1106
Sample dilution	1	1
Odour concentration, ou	360	420
Hedonic tone	mildly unpleasant	mildly unpleasant
Odour character	meat, fat	meat, fat
Average Odour Concentration, ou	390	
Odour Flux Rate, ou/m ² /min	13	
Odour mass rate, ou/min	1600	
Flux Testing Parameters		
Equilibration time, hrs	1002 - 1045	
Sweep Rate, L/min	4.33	
Penetration Depth, mm	7	
Surface temperature (°C)	47	
Chamber temperature (°C)	45	
Ambient temperature (°C)	29	
Gas Analyser Readings		
Oxygen (%V/V)	21.8	
Carbon Dioxide (%V/V)	12.5	
Hydrogen Sulfide (ppm) ¹	0.06	

Note:

Source: JEROME® 631-X HYDROGEN SULFIDE ANALYZER OPERATION MANUAL (www.azic.com)

Potential Interferences

The gold film sensors used in the Jerome® hydrogen sulfide analyzers do not respond to the following compounds:
 • Hydrocarbons • CO, CO₂ and SO₂ • Water vapor

However, the following compounds may cause the gold film sensor to respond:

- Chlorine • Ammonia • NO₂ • Most mercaptans (organic sulfur compounds or "thiols")



Octimo 5 March 2019

2.3 Event 2 - Morts - Fresh

Client: Advanced Composting Technologies of Aust. Test Location: File 3 - Fresh Morts Waste		
Date: 22/02/2017		
Report No: R004009		
Ekimo Staff: 0		
Test Location Details		
GPS co-ordinates:	38°23'7"S, 144°8'16"E	
Location Description:	North west side of stockyard	
Surface Description:	Fresh morts waste, compost mixture & activator	
Area Classification:	Agricultural	
Source dimensions (LxWxH), m:	18 x 7 x 0.5	
Source area, m ² :	126	
Sampling Method:	AS4323.4 (Flux)	
Sampling Results		
	Test 1	Test 2
Sampling time, hrs:	1311 - 1322	1323 - 1334
Sample dilution:	1	1
Odour concentration, ou:	1700	2300
Hedonic tone:	mildly unpleasant	mildly unpleasant
Odour character:	grain, earth, rubbish	grain, earth, rubbish
Average Odour Concentration, ou:	2000	
Odour Flux Rate, ou/m ² /min:	66	
Odour mass rate, ou/min:	12000	
Flux Testing Parameters		
Equilibration time, hrs:	1240 - 1311	
Sweep Rate, L/min:	421	
Penetration Depth, mm:	27	
Static Pressure, Pa:	30	
Surface temperature (°C):	40	
Chamber temperature (°C):	55	
Ambient temperature (°C):	34	



2.4. Event 2 - Abattoir - Fresh

Client	Advanced Composting Technologies of Australasia Test Location		File # - Fresh Abattoir Waste
Date	2/28/2017		0
Report No.	R004609		Brisbane, VIC
Ektimo Staff	0		
Test Location Details:			
GPS co-ordinates	38°23'7"S; 144°0'16"E		
Location Description	North west side of stockyard		
Surface Description	Fresh abattoir waste, compost mixture & activator		
Area Classification	Agricultural		
Source dimensions (L x W x H), m	16 x 5.5 x 3		
Source area, m ²	130		
Sampling Method	AS4323.4 (Flux)		
Sampling Results:			
	Test 1	Test 2	
Sampling time, hrs	1439 - 1451	1452 - 1502	
Sample dilution	1	1	
Odour concentration, ou	1800	2000	
Hedonic tone	very unpleasant	very unpleasant	
Odour character	meat rancid	meat rancid	
Odour Flux Rate, ou/m ² /min	62		
Odour mass rate, ou/min	8100		
Flux Testing Parameters:			
Equilibration time, hrs	1405 - 1438		
Sweep Rate, L/min	4.29		
Penetration Depth, mm	7		
Slab Pressure, Pa	0		
Surface temperature (°C)	46		
Chamber temperature (°C)	49		
Ambient temperature (°C)	33		



2.5 Event 2 - Hatchery - Fresh

Client: Advanced Composting Technologies of Australia Test Location		Site: Fresh Hatchery Waste
Date: 22/02/19		0
Report No.: R004009		Binned/In/VC
Ektimo Staff: 0		
Test Location Details		
GPS co-ordinates	38°23'7"S 144°6'16"E	
Location Description	North west side of stockyard	
Surface Description	Fresh chicken hatchery waste, compost mixture & active lot	
Area Classification	Agricultural	
Source dimensions (L x W x H), m	10.5 x 5 x 3	
Source area, m ²	52	
Sampling Method	AS4323.4 (Flux)	
Sampling Results		
	Test 1	Test 2
Sampling time, hrs	1530 - 1542	1543 - 1555
Sample dilution	1	1
Odour concentration, ou	3300	2200
Hedonic tone	mildly unpleasant	mildly unpleasant
Odour character	grain rubbish	grain rubbish
Average Odour Concentration, ou	2700	
Odour Flux Rate, ou/m ² /min	92	
Odour mass rate, ou/min	14000	
Flux Testing Parameters		
Equilibration time, hrs	1505 - 1530	
Sweep Rate, L/min	4.37	
Penetration Depth, mm	7	
Static Pressure, Pa	20	
Surface temperature (°C)	44	
Chamber temperature (°C)	44	
Ambient temperature (°C)	34	



2.6 Event 3 - Morts - 2 Weeks

Client: Advanced Composting Technologies of Aus Test Location: Plot 3 - Morts Waste, Agent 2 weeks		
Date: 14/03/2017		
Report No: R004009 Barrackburn VIC		
Ekimo Staff: View Address		
Test Location Details		
Location Description:	North west side of stockyard	
Surface Description:	Morts waste, compost mixture & activator	
Area Classification:	Agricultural	
Source dimensions (L x W x H), m:	18 x 7 x 3.5	
Source area, m ² :	126	
Sampling Method:	AS4323.4 (Flux)	
Sampling Results:	Test 1:	Test 2:
Sampling time, hrs:	0953 - 1004	1005 - 1016
Sample dilution:	1	1
Odour concentration, ou:	2000	1800
Hedonic tone:	very unpleasant	very unpleasant
Odour character:	putrid, rotten meat	putrid, rotten meat
Average Odour Concentration, ou:	1900	
Odour Flux Rate, ou/m ² /min:	85	
Odour mass rate, ou/min:	12000	
Flux Testing Parameters		
Equilibration time, hrs:	0925 - 0953	
Sweep Rate, L/min:	4.48	
Penetration Depth, mm:	2	
Surface temperature (°C):	55	
Chamber temperature (°C):	34	
Ambient temperature (°C):	26	



2.7 Event 3 - Abattoir - 2 Weeks

Client	Advanced Composting Technologies of Aus Test Location		Pile 4 - Abattoir Waste - Aged 7 weeks
Date	14/03/2017		0
Report No.	R004003		Barraboolburn, VIC
Ektimo Staff	Greg Scarsby		
Test Location Details			
GPS co-ordinates	38°23'5.144616"E		
Location Description	North west side of stockyard		
Surface Description	Abattoir waste, compost mixture & activator		
Area Classification	Agricultural		
Source dimensions (L x W x H), m	16 x 5.5 x 3		
Source area, m ²	88		
Sampling Method	AS4323.1 (Flux)		
Sampling Results			
	Test 1		Test 2
Sampling time, hrs	1110 - 1121		1126 - 1138
Sample dilution	1		1
Odour concentration, ou	690		690
Hedonic tone	mildly unpleasant		mildly unpleasant
Odour character	fertiliser		fertiliser
Average Odour Concentration, ou			690
Odour Flux Rate, ou/m ² /min			23
Odour mass rate, ou/min			3000
Penetration Depth, mm			7
Surface temperature (°C)			65
Chamber temperature (°C)			49
Ambient temperature (°C)			30
Gas Analyser Results			
Oxygen (%VM)			0.3
Carbon Dioxide (%VM)			26.5
Hydrogen Sulfide (ppm)			0

Note:
 Source: JEROME® 631-X HYDROGEN SULFIDE ANALYZER OPERATION MANUAL (www.azic.com)
Potential Interferences:
 The gold film sensors used in the Jerome® hydrogen sulfide analyzers do not respond to the following compounds:
 • Hydrocarbons • CO, CO2, and SO2 • Water vapor.
 However, the following compounds may cause the gold film sensor to respond:
 • Chlorine • Ammonia • NO2 • Most mercaptans (organic sulfur compounds or "thiols").



2.3 Event 3 - Hatchery - 2 Weeks

Client		Advanced Composting Technologies of Australasia Test Location		Plot 5 / Hatchery Waste - Aged 2 weeks	
Date		31/03/17		0	
Report No.		R004009		Barramulla, VIC.	
Ektime Staff		Greg Scamsey			
Test Location Details:					
GPS co-ordinates	38°23' S, 144°16' E				
Location Description	North west side of stockyard				
Surface Description	Hatchery waste, compost mixture & activator				
Area Classification	Agricultural				
Source dimensions (L x W x H), m	10.5 x 5 x 3				
Source area, m ²	152				
Sampling Method	AS4323.4 (Flux)				
Sampling Results:					
	Test 1		Test 2		
Sampling time, hrs	1223 - 1234		1235 - 1247		
Sample dilution	1		1		
Odour concentration, ou	3900		4300		
Hedonic tone	very unpleasant		very unpleasant		
Odour character	animal waste		animal waste		
Average Odour Concentration, ou			4100		
Odour Flux Rate, ou/m ² /min			140		
Odour mass rate, ou/min			21000		
Flux Testing Parameters:					
Equilibration time, hrs	1155 - 1220				
Sweep Rate, L/min	4.28				
Penetration Depth, mm	37				
Static Pressure, Pa	0				
Surface temperature (°C)	60				
Chamber temperature (°C)	48				
Ambient temperature (°C)	29				



2.9 Event 4 - Grease Trap - 17 Weeks

Client: Advanced Composting Technologies of Australia Location: File: Grease Trap - April 17 weeks		
Date: 31/4/2017		
Report No: R004009-1 Data0060001.V01		
Ektimo Staff: 0		
Test Location Details:		
GPS co-ordinates	38°23'7"S, 144°03'18"E	
Location Description	North west side of stockyard	
Surface Description	Grease trap waste, compost mixture & activator	
Area Classification	Agricultural	
Source dimensions (LxWxH), m	16 x 6.5 x 2.5	
Source area, m ²	119.1	
Sampling Method	AS4323.4 (Flux)	
Sampling Results:		
	Test 1	Test 2
Sampling time, hrs	1242 - 1249	1250 - 1259
Sample dilution	1	1
Odour concentration, ou	140	190
Hedonic tone	mildly unpleasant	mildly unpleasant
Odour character	fat	fat
Average Odour Concentration, ou	160	
Odour Flux Rate, ou/m ² /min	5.9	
Odour mass rate, ou/min	700	
Flux Testing Parameters:		
Equilibration time, hrs	1215 - 1241	
Sweep Rate, L/min	4.65	
Penetration Depth, mm	7	
Static Pressure, Pa	0	
Surface temperature (°C)	14	
Chamber temperature (°C)	26	
Ambient temperature (°C)	16	



2.10 Event 4 - Abattoir - 15 Weeks

Client: Advanced Composting Technologies of Aust Test Location: Site 4 - Abattoir Waste - aged 15 weeks		
Date: 2/14/2017 0		
Report No.: R004009-1 Benrockham, VIC		
Eklimo Staff: Greg Scrimney		
Test Location Details		
GPS coordinates:	38°23'7"S, 144°6'16"E	
Location Description:	North west side of stockyard	
Surface Description:	Abattoir waste, compost mixture & activator	
Area Classification:	Agricultural	
Source dimensions (L x W x H), m:	16 x 5.5 x 3	
Source area, m ² :	88	
Sampling Method:	AS4323.4 (Flux)	
Sampling Results		
	Test 1	Test 2
Sampling time, hrs:	1039 - 1047	1005 - 1016
Sample dilution:	1	1
Odour concentration, ou:	260	360
Hedonic tone:	mildly unpleasant	mildly unpleasant
Odour character:	dog food	dog food
Average Odour Concentration, ou:	320	
Odour Flux Rate, ou/m ² /min:	12	
Odour mass rate, ou/min:	1500	
Flux Testing Parameters		
Equilibration time, hrs:	1014 - 1039	
Sweep Rate, L/min:	4.68	
Penetration Depth, mm:	7	
Surface temperature (°C):	25	
Chamber temperature (°C):	24	
Ambient temperature (°C):	14	



2.11 Event 4 - Hatchery - 15 Weeks

Client Advanced Composting Technologies of Aus5 Test Location		Pile 5 - Hatchery Waste - Aged 15 weeks	
Date 0/14/2017		0	
Report No. R004009-1		Barrackburn, VIC	
Ektimo Staff Chris Scarsay			
Test Location Details			
GPS coordinates	36°23' S, 144°01' E		
Location Description	North west side of stockyard		
Surface Description	Hatchery waste, compost mixture & activator		
Area Classification	Agricultural		
Source dimensions (L x W x H), m	8 x 6 x 2.2		
Source area, m²	152		
Sampling Method	AS4323.4 (Flux)		
Sampling Results		Test 1	Test 2
Sampling time, hrs		11:31 - 11:39	11:41 - 11:51
Sample dilution		1	1
Odour concentration, ou		300	420
Hedonic tone		mildly unpleasant	mildly unpleasant
Odour character		compost, grass, faeces	compost, grass, faeces
Average Odour Concentration, ou		360	
Odour Flux Rate, ou/m²/min		13	
Odour mass rate, ou/min		2000	
Penetration Depth, m/h		7	
Surface temperature (°C)		19	
Chamber temperature (°C)		29	
Ambient temperature (°C)		16	



2.12 Event 5 - Morts - 19 Weeks

Client		
Advanced Composting Technologies of Ausit	Test Location	File 3 - Morts Waste - Aged 19 weeks
Date		
25/07/17		
Report No.		
R004009		Batmoreburn VIC
Ektimo Staff		
Greg Sceneray		
Test Location Details		
Location Description	North West Side of Stockyard	
Surface Description	Morts waste, compost mixture & activator	
Area Classification	Agricultural	
Source dimensions (L x W x H), m	10 x 7 x 3.5	
Source area, m ²	178	
Sampling Method	AS4323.4 (Flux)	
Sampling Results		
	Test 1	Test 2
Sampling time, hrs	1258 - 1305	1306 - 1312
Sample dilution	1	1
Odour concentration, ou	1100	1400
Hedonic tone	mildly unpleasant	mildly unpleasant
Odour character	compost	compost
Average Odour Concentration, ou	1200	
Odour Flux Rate, ou/m ² /min	44	
Odour mass rate, ou/min	7800	
Flux Testing Parameters		
Equilibration time, hrs	1234 - 1258	
Sweep Rate, L/min	4.60	
Penetration Depth, mm	17	
Surface temperature (°C)	55	
Chamber temperature (°C)	25	
Ambient temperature (°C)	17	

