Health Risk Assessment Mulch Storage Centre

Glen Eira City Council

60 Neerim Road

January 2011

88241

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Audit Committee - 25 February 2011

Mulch Storage Facility 60 Neerim Road

Noel Arnold and Associates Pty Ltd (NAA) was engaged to undertake a health risk assessment at the Mulch Storage Facility at 60 Neerim Road, Carnegie. The NAA report is attached and outlines the objectives, methodology, findings and recommendations.

NAA conducted air testing at various locations around the facility, reviewed relevant safety standards for mulch and examined public signage at the facility. The report outlines a number of simple recommendations to mitigate any risks associated with the mulch facility and Council will implement these recommendations.

A summary of the findings are as follows:

- Results of air testing conducted at various locations around the mulch facility (including the adjacent playground) indicate that the concentrations of bacteria and fungi in the air are not elevated when compared to the general environmental exposure.

- There are Australian Standards for composts, soil conditioners and mulches, however these do not apply to the Council mulch facility as the standard excludes leaf and chipped garden waste and this is the type of material stored at the facility. There are no specific Environment Protection Authority licensing requirements that apply to the Council mulch facility.

- Based on a literature review of the health and safety risks associated with composts, soil conditioners and mulches, and the warnings applied to commercially available mulch, users may still be potentially exposed to bacteria and fungi, despite the favourable air quality testing results.

The report makes the following recommendations:

- Prevent large accumulation or build-up of mulch material at the site, i.e. contain as is reasonably practicable the mulch stockpile within the confines of the current storage area. If necessary stockpile the material at a Council depot and truck it to the Neerim Road facility as required.

- To protect staff from potential risks, provide training, instructions, information and appropriate personal protective equipment to Council employees likely to come in contact with this material. The personal protective equipment that is recommended for Council employees handling the mulch material is;

    - Disposable dust mask (p2)
    - Gloves
    - Washing of hands after use

The following recommendations are made to manage potential risks for public users of the facility;

- Install a localised fine mist spray system that can be activated, with a push button to dampen dust, for members of the public, to use when collecting mulch.

- Provide warning signage that includes information about risks, safety, first aid and disposal of material. Provide flyers in waterproof container with a warning notice that mulch users can take away for reference purposes.

- Personal protective equipment is also recommended for members of the public, but this is a recommendation that should be communicated through signage at the site, as per the recommendation that comes on commercially available products.

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Glen Eira City Council

60 Neerim Road

Executive Summary

Noel Arnold & Associates Pty Ltd (NAA) was engaged by Tammy Gelley from Glen Eira City Council to undertake a health risk assessment at a Mulch Storage Centre at 60 Neerim Road. The site work was conducted by Ossian Geraghty, Managing Consultant, NAA on the Friday 21st January 2011.

Glen Eira City Council have run a mulch storage facility at this location for approximately one year and have recently become concerned at the potential health risks that may face council employees, the general public amenities surrounding the facility and users of the mulch facility.

The objectives of the assessment were;

- To assess the risks of humans contracting *Legionella* and other respiratory diseases from exposure to the mulch material;
- To determine if there are any specific EPA licensing requirements with which the Council must comply;
- To determine if there are any applicable Australian Standards for garden mulch;
- Where applicable Australian Standards exist, determine if the Neerim Road facility is compliant;
- To conduct air testing to determine whether there are abnormally high levels of airborne bacteria and fungi (yeast and moulds) present in areas surrounding the mulch storage area, when compared with nearby reference locations; and
- To determine the adequacy of existing signage.

Findings

A risk assessment was carried out and its findings suggest it is likely that workers and mulch users are potentially exposed to bacteria (eg. *Legionella*) and fungi as a result of handling the mulch material. These risks are well documented in literature and there are some simple controls which can be implemented to protect the people at risk.

There are no specific EPA licensing requirements that apply to the Glen Huntly Park facility.

There is an Australian Standard, *AS 4454:2003 Composts, soil conditioners and mulches*, that applies to certain prescribed commercial composting and mulch processes. The standard specifies physical, chemical, biological and labelling requirements for compost, mulches and soil conditioners. This standard is not applicable to the Neerim road facility as it specifically scopes out raw mulch (leaf and chipped garden wastes), unless they have been subjected to a pasteurisation or complete composting process. As the Neerim Road facility is not a composting facility and it does not pasteurise the mulch produced, it falls outside the scope of this standard.

Air testing was conducted and the concentrations of bacteria and fungi (yeast and mould) were measured at locations surrounding the mulch storage shed. Human exposure to microbial growth may occur by inhalation, physical contact or ingestion. However, the presence of microbial growth on materials or in the air may not necessarily indicate that people will be exposed or exhibit health affects. Factors that determine health effects include the nature of the microbial growth, route of exposure and the susceptibility of the person(s) exposed. Due to these factors it is not possible to determine "safe" or "unsafe" levels of exposure to microbial growth. Rather, a number of standards have been adopted to

determine whether the air may have abnormally high levels of mould and bacterial bioaerosols.

The American Conference of Governmental Industrial Hygienists (ACGIH) has published the following guidelines for determination of possible airborne microbial contamination:

"A situation can be considered unusual when the overall levels of the bioaerosol (microbes) *are at least an order of magnitude (at least ten times higher) than those that commonly occur in a control environment."*

Air testing was conducted and the concentrations of bacteria and fungi at locations surrounding the mulch storage shed and at an external reference location in the area upwind of the Mulch Storage shed. The results for bacteria and fungi (yeast and mould) in air were of similar orders of magnitude when compared with the reference location. The areas sampled included the childrens play area and the results indicate that the concentrations of bacteria and fungi in air are not elevated when compared to general environmental exposure. Young people, especially children, rarely get legionnaires disease, and are not considered a risk group.

The current warning signage was assessed and is not adequate, hence additional warning signage is required.

Recommendations

NAA make the following recommendations to manage risk;

General Recommendations

1) Prevent large accumulation or build-up of mulch material at the site, ie contain as is reasonably practicable the mulch stockpile within the confines of the current storage area. If necessary stockpile the material at a Council depot and truck it to the Neerim road facility as required.

The following recommendations are made to manage the risk for Council employees;

2) Provide training, instructions, information and appropriate PPE to Council employees likely to come in contact with this material;

3) The PPE that is recommended for Council employees handling the mulch material is;
   - Disposable dust mask (P2);
   - Gloves; and
   - Washing of hands after use.

The following recommendations are made to manage the risk for public users of the facility;

4) Install a localised fine mist spray system that can be activated, with a push button to dampen dust, for members of the public, to use when collecting mulch.

5) Provide warning signage as per the example in Appendix E. Provide flyers in a waterproof container with the warning notice that mulch users can take away for reference purposes;

6) PPE is also recommended for members of the public, but this is a recommendation that should be communicated through signage at the site, as per the warnings that appear on commercially available products.

Statement of Limitations

This report has been prepared in accordance with the agreement between Glen Eira City Council and Noel Arnold & Associates Pty Ltd.

Within the limitations of the agreed upon scope of services, this work has been undertaken and performed in a professional manner, in accordance with generally accepted practices, using a degree of skill and care ordinarily exercised by members of its profession and consulting practice. No other warranty, expressed or implied, is made.

This report is solely for the use of Glen Eira City Council and any reliance on this report by third parties shall be at such party's sole risk and may not contain sufficient information for purposes of other parties or for other uses. This report shall only be presented in full and may not be used to support any other objective than those set out in the report, except where written approval with comments are provided by Noel Arnold & Associates Pty Ltd.

Health Risk Assessment Mulch Storage Centre

Glen Eira City Council

60 Neerim Road

Table of Contents

1. Introduction

Noel Arnold & Associates Pty Ltd (NAA) was engaged by Tammy Gelley from Glen Eira City Council to undertake a health risk assessment at a Mulch Storage Centre at 60 Neerim Road. The site work was conducted by Ossian Geraghty, Managing Consultant, NAA on the Friday 21st January 2011.

2. Background

Glen Eira City Council have run a mulch storage facility at this location for approximately one year and have recently become concerned at the potential health risks that may face council employees, the general public amenities surrounding the facility and users of the mulch facility. The facility handles mulched bark material that the Council collect as part of their services. In addition some private operators also dispose of mulched tree material in this area. Prior to this the Council ran a similar facility at an alternate location for a number of years.

NAA has been requested to undertake a health risk assessment of the site.

3. Objectives

The objectives of the assessment were;

- To assess the risks of contracting *Legionella* and other respiratory diseases from exposure to the mulch material;
- To determine if there are any specific EPA licensing requirements with which the Council must comply;
- To determine if there are any applicable Australian Standards for garden mulch;
- Where applicable Australian Standards exist, determine if the Neerim Road facility is compliant;
- To conduct air testing to determine whether there are abnormally high levels of airborne bacteria and fungi (yeast and moulds) present in areas surrounding the mulch storage area, when compared with nearby reference locations; and
- To determine the adequacy of existing signage.

4. Methodology

NAA visited the Mulch Storage Centre at 60 Neerim Road and undertook an assessment that involved:

- A survey of the area;
- Discussions with relevant personnel, Keith Graham and Laurie Unwin;
- Liaison with the EPA to determine if licensing requirements apply;
- A review of any relevant documentation including safe operating procedures, control documentation, and standards (as applicable);
- Completion of a risk assessment of the site against any applicable standards; and
- Conducting air testing around the mulch storage facility and at reference locations.

4.1 Air Monitoring

Airborne sampling for bacteria and fungi was conducted in ten external locations. Two external reference samples were also collected as controls to enable comparison with the samples. The sampling was performed with a Micro Sampler, which draws air past an agar sampling plate. The agar plates were forwarded to Silliker Australia for enumeration. Photos of the site and the air sampling locations are contained in Appendix A. A calibration certificate for the air sampler used is contained in Appendix B.

4.1.1 Fungi Air Sampling

Microbial sampling for airborne fungi (yeast and moulds) was conducted using a hand-held microbial air sampling device to collect air samples onto malt extract agar (MEA) microbial plates.

4.1.2 Bacteria Air Sampling

Microbial sampling for airborne bacteria was conducted using a hand-held microbial air sampling device to collect air samples onto trypticase soy agar (TSA) microbial plates.

4.1.3 Applicable Guidelines

Human exposure to microbial growth may occur by inhalation, physical contact or ingestion. However, the presence of microbial growth on materials or in the air may not necessarily indicate that people will be exposed or exhibit health affects. Factors that determine health effects include the nature of the microbial growth, route of exposure and the susceptibility of the person(s) exposed. Due to these factors it is not possible to determine "safe" or "unsafe" levels of exposure to microbial growth. Rather, a number of standards have been adopted to determine whether the air may have abnormally high levels of mould bioaerosols.

The American Conference of Governmental Industrial Hygienists (ACGIH) has published the following guidelines for determination of possible airborne microbial contamination:

"A situation can be considered unusual when the overall levels of the bioaerosol (microbes) *are at least an order of magnitude (at least ten times higher) than those that commonly occur in a control environment."*

5. Findings

5.1 Observations

Daily weather observations were taken from the Bureau of Meteorology and are presented below:

Table 1 - Daily Weather Observations

Date	Min Temp °C	Max Temp °C	Wind Direction	9 am		3 pm	
				Temp °C	Relative Humidity %	Temp °C	Relative Humidity %
21st January	13.1	22.5	N	13.9	64	21.1	41

The ambient outdoor conditions were mild and humidity levels were moderate to high during the period of the assessment.

5.2 Survey of area

Glen Eira City Councils Mulch Storage Area is located at the corner of Glen Huntly Park, which is at the corner of Booran Road and Neerim Road. The Mulch storage area is positioned in a public car park with a childrens play area in close proximity to the storage shed, See Photos in Appendix A. During the site visit discussions took place with Laurie Unwin, Park Services Manager, and Keith Graham, driver of the compact track loader. It was explained that generally mulch material is contained within the shed but that occasionally this material during peak times overflows into the car park area. The material was examined on the day of the site audit and it consists predominantly of shredded branch type material. Small amounts of mulched leaves were present in some areas of the mulch pile. It was explained that at certain times of the year the material is all shredded bark and branch material but that in the summer months there is more likely to be an increased amount of green material (leaves present within the mulch). This would appear from the description of the process to compost to limited extent depending on how long it is left in-situ among other factors.

There is a childrens play area and public amenity, picnic area, in close proximity to the Mulch storage shed.

The mulch shed already contains a sprinkler system, which it was explained in place for fire control purposes.

5.3 Exposure risks Legionella

Exposure to shredded mulch, potting mix, or compost including general garden compost and commercially available products can carry a risk of exposure to various fungi (yeast and moulds) and bacteria, including *Legionella*.

Legionnaires disease (Legionellosis) is a serious and sometimes fatal form of pneumonia caused by the bacteria *Legionella*. There are over forty strains of *Legionella* bacteria but only a few are known to cause disease in humans. Legionnaires in humans is more commonly associated with contaminated water systems from sources such as cooling towers and showers. The bacterial strains that are most commonly associated with human disease are *pneumophila* and *longbeachae*. *Longbeachae* is the strain of *Legionella* most commonly associated with composts, mulch and potting mixes, while *pneumophila* is more commonly associated with cooling towers and other water systems.

Some commercially available mulch products are not considered to present a risk of exposure to Legionella where they have undergone a pasteurisation process. However many commercially available composts and mulch products present a risk of exposing users to fungi and bacteria for eg. *Legionella*. See photos, Appendix C.

The material stored at Glen Huntly Park is not pasteurised or treated and therefore has the potential to exposure workers, users and the general public in the surrounding area to elevated levels of bacteria and fungi, above background. Potentially most at risk groups are members of the who collect and use the mulch material for gardening, the compact track loader driver and other council workers who regularly work with the mulch material.

There are a number of simple precautions that are recommended to reduce the risks of exposure to compost and mulch materials including:

- Avoiding breathing any dust;
- Wearing particulate masks where necessary (P2);
- Wearing protective gloves;
- Washing hands immediately after use;
- Keeping product moist when handling to minimise dust; and
- Use of minimum warning signage at the mulch storage facility.

5.4 EPA licensing requirements

There are no specific licensing requirements from the EPA that need to be met for a facility of the type being run by Glen Eira Council at Glen Huntly Park.

5.5 *AS 4454:2003 Composts, soil conditioners and mulches*

There is an Australian Standard, *AS 4454:2003 Composts, soil conditioners and mulches*, that applies to certain prescribed commercial composting and mulch processes. The standard specifies physical, chemical, biological and labelling requirements for compost, mulches and soil conditioners. This standard is not applicable to the Neerim road facility as it specifically scopes out raw mulch (leaf and chipped garden wastes), unless they have been subjected to a pasteurisation or complete composting process. As the Neerim Road facility is not a composting facility and it does not pasteurise the mulch produced, it falls outside the scope of this standard.

5.6 Air Sampling Results

Table 2 presents a summary of the results for airborne yeast and mould sampling conducted at representative locations and reference external areas.

Table 2 Results of Air Sampling Fungi (Yeasts & Moulds)

Sample No.	Sample location	Total Yeast Count [1]CFU/m³*	Total Mould Count [1]CFU/m³*
External Reference Air Samples			
88241-11	Outside Glen Eira College, Booran Road	< 10	1600
88241-26	Outside Glen Eira College, Booran Road	< 20	1700
Air Samples			
88241-12	Inside Mulch Shed	< 20	4100
88241-13	20m from Mulch Shed in Carpark	< 20	1700
88241-14	In picnic table area in park	< 20	2000
88241-15	Corner Neerim Road/Booran Road (Across Street)	< 20	1700
88241-16	Childrens play area	< 20	1900
88241-17	Inside Mulch Shed – Bobcat running	< 20	140
88241-18	Childrens play area – Bobcat running	< 20	2300
88241-19	In picnic table area in park – Bobcat running	< 20	4200
88241-20	Corner Neerim Road/Booran Road (Across Street) – Bobcat running	< 20	2500
88241-22	20m from Mulch Shed in Carpark– Bobcat running	< 20	2000

Note 1: CFU: colony-forming units.

Please refer to Appendix D for the Laboratory Analysis Certificate.

Table 3 presents a summary of the results for airborne bacteria sampling conducted at representative locations and reference external areas.

Table 3 Results of Air Sampling Bacteria

Sample No.	Sample location	Bacteria Count [1]CFU/m³
External Air		
88241-01	Outside Glen Eira College, Booran Road	510
88241-25	Outside Glen Eira College, Booran Road	1100
Internal Air		
88241-02	Inside Mulch Shed	1200
88241-03	20m from Mulch Shed in Carpark	900
88241-04	In picnic table area in park	1600
88241-05	Corner Neerim Road/Booran Road (Across Street)	640
88241-06	Childrens play area	980

Table 3 Results of Air Sampling Bacteria		
Sample No.	**Sample location**	**Bacteria Count [1]CFU/m³**
88241-07	Inside Mulch Shed – Bobcat running	1700
88241-08	Childrens play area – Bobcat running	1500
88241-09	In picnic table area in park – Bobcat running	1500
88241-10	Corner Neerim Road/Booran Road (Across Street) – Bobcat running	1700
88241-21	20m from Mulch Shed in Carpark– Bobcat running	1700

Note 1: CFU: colony-forming units.

Please refer to Appendix D for the Laboratory Analysis Certificate.

5.7 Signage

The current signage at the Glen Huntly Park Storage facility is shown in Appendix A, Figure 1., Photo 6. The current signage does not adequately address all of the potential risks of exposure from the mulch material.

Appendix E includes an example of the warning signage that should be clearly signed at the mulch collection centre for the benefit of public users. This is similar to the wording used on commercially available products.

6. Discussion

Literature research, data obtained from the Department of Human Services and the warnings of risk that are commonly applied to commercially available mulch, compost and potting mix products, all clearly point to a risk of exposure to bacteria (eg. Legionella), and fungi (yeast and moulds) associated with the type of product stored at Glen Eira City Councils Neerim Road facility. While these risks are known and clearly documented the common approach to manage these risks, is to employ a series of simple controls as outlined in Section 5.3 of this report. It is critical that these controls are clearly communicated to the workers and users of the facility. This can be achieved through training in the case of workers and signage and through the placement of flyers at the site, for members of the public. During the scoping stages of this project a specific concern was highlighted with respect to the proximity of the mulch storage shed to the childrens play area and a local school. Children rarely contract *Legionella* and young people are not considered an at risk group in *Legionella* risk assessments.

It is recommended that a localised fine mist spray system be installed, that could be activated by the use of a push button switch for a set time, so that members of the public collecting mulch material could dampen the stockpile to minimise the potential for dust creation.

The risks of exposure to bacteria such as *Legionella* and fungi for members of the public from collecting bulk mulch material at the collection centre could be minimised by providing the material bagged at the site, with appropriate warnings on the bags. However there would still be a risk to users when they use it in their gardens or at its end use so the benefit of doing this is questionable.

No specific EPA licensing requirements or standards were identified during this risk assessment which applies to the activities conducted at the site.

Measurements of bacteria and fungi in air were taken in and around the mulch storage area under normal circumstances and when the compact track loader was running and agitating the mulch stock pile.

Typically bacteria and fungi are found in outdoor air and are abundant in dust and on surfaces.

There are no absolute standards in determining acceptable levels of microbiological colonies in air. The approach applied in assessment is to measure at a comparable reference location and take measurements in the area where there are concerns and compare the ratio of reference location to the results in the areas of concern. This will not give an identification of the species of bacteria or fungi present but does give an indicative enumerated result as to whether there are elevated levels of colony forming units per cubic meter, when compared with a reference location.

Applying this assessment criterion to the air samples collected, the outdoor reference samples for bacteria contained between 510 - 1100 CFU/m^3. The bacteria in air samples collected within the mulch shed contained between 1100 and 1700 CFU/m^3.

The bacteria in air samples in other areas contained between 640 - 1700 CFU/m^3. The samples collected with the compact track loader running and without it running don't show significant differences in concentrations. Based on these results the concentrations of general bacteria are not considered abnormally high in the areas around the mulch storage area with comparison to a reference location. The bacteria in air samples in the childrens playground area show a concentration of bacteria in air of between 980-1500 CFU/m^3. These results indicate that the concentration of bacteria in air in the childrens play area at the time of sampling was of the same order of magnitude as that of a reference location. This essentially means that the concentration of bacteria in air is not significantly different than it is in the external reference location.

Applying the above assessment criterion to the air samples collected, the outdoor reference samples for mould contained between 1600 - 1700 CFU/m^3. The mould in air samples collected within the mulch shed contained between 140 - 4100 CFU/m^3. The mould in air samples in other areas contained between 1700 - 4200 CFU/m^3. The samples collected with the compact track loader running and without it running don't show significant differences in concentrations. Based on these results the concentrations of general moulds in air are not considered abnormally high in the areas around the mulch storage area with comparison to a reference location. The mould in air samples in the childrens playground area, show a concentration of mould in air of between 1700-2300 CFU/m^3. These results indicate that the concentration of mould in air in the childrens play area at the time of sampling was of the same order of magnitude as that of a reference location. This essentially means that the concentration of mould in air is not significantly different than it is in the external reference location.

The results for yeasts in all samples were below the laboratories limit of reporting.

Based upon this air sampling data the concentrations of bacteria and fungi in locations surrounding the mulch storage area on the day the sampling took place were of comparable order of magnitude when compared with the reference samples.

Bulk sampling of the mulch stock pile for *Legionella* was not carried out as this is a difficult test to conduct and based on literature and other information sources there is certainly a potential for this to exist, although it may quite likely not show up in sampling. Air sampling for *Legionella* is not considered an effective method of sampling due to the short time span of the bacterium in air.

7. Recommendations

NAA make the following recommendations to manage risk;

General Recommendations

1) Prevent large accumulation or build-up of material at the site, ie contain as is reasonably practicable the mulch stockpile within the confines of the current storage area. If necessary stockpile the material at a Council depot and truck it to the Neerim road facility as required.

The following recommendations are made to manage the risk for Council employees;

2) Provide training, instructions, information and appropriate PPE to Council employees likely to come in contact with this material;

3) The PPE that is recommended for Council employees handling the mulch material is;

- Disposable dust mask (P2);
- Gloves; and
- Washing of hands after use.

The following recommendations are made to manage the risk for public users of the facility;

4) Install a localised fine mist spray system that can be activated, with a push button to dampen dust, for members of the public, to use when collecting mulch.

5) Provide warning signage as per the example in Appendix E. Provide flyers in a waterproof container with the warning notice that mulch users can take away for reference purposes;

6) PPE is also recommended for members of the public, but this is a recommendation that should be communicated through signage at the site, as per the warnings that appear on commercially available products.

8. Conclusions

A risk assessment was carried out and it is likely that workers and mulch users are potentially exposed to bacteria (eg. *Legionella*) and fungi, as a result of handling the mulch material. The risks of working with these products are well documented in literature and there are some simple controls which can be implemented to protect the people at risk.

There are no specific EPA licensing requirements that apply to the Glen Huntly Park facility.

There is an Australian Standard, *AS 4454:2003 Composts, soil conditioners and mulches,* that applies to certain prescribed commercial composting processes. This standard is not applicable to the Neerim road facility as it specifically scopes out raw mulch (leaf and chipped garden wastes), unless they have been subjected to a pasteurisation or complete composting process. As the Neerim Road facility is not a composting facility and it does not pasteurise the mulch it falls outside the scope of this standard.

Air testing was conducted and the concentrations of bacteria and fungi at locations surrounding the mulch storage shed were normal when compared with a reference location.

The current warning signage was assessed and is not adequate, hence additional warning signage is required.

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Appendix A: Photos of Site

Figure 1 – Site Photos

Photo 1. Mulch shed with compact track loader operating

Photo 2. Mulch material in shed

Photo 3. Childrens play area

Photo 4. Mulch Shed and amenity area

Photo 5. Mulch Shed and amenity area

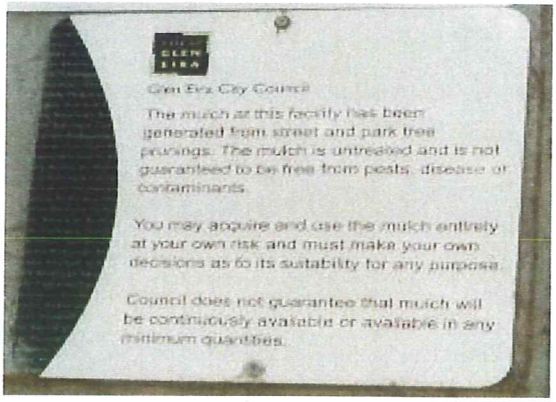

Photo 6. Signage

Figure 1 – Site Photos

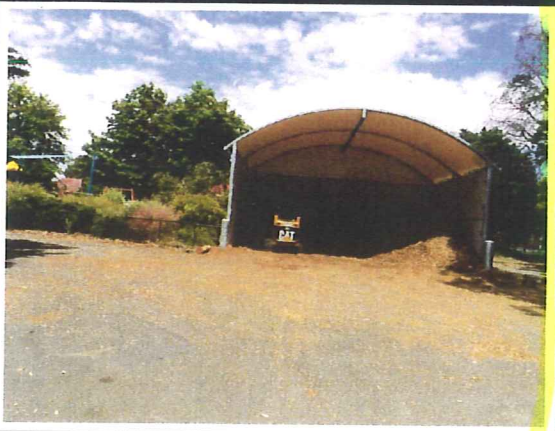

Photo 7. Mulch shed with compact track loader operating

Photo 8. External Reference Sample location

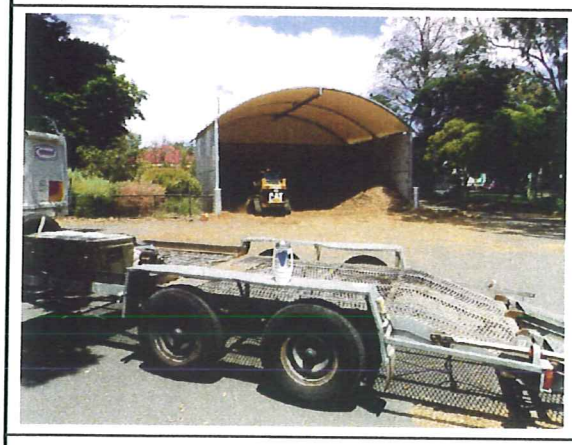

Photo 9. Sample location 20 metres from mulch shed

Photo 10. Sample location picnic table in park

Photo 11. Sample location corner Neerim Rd/Booran Rd

Photo 12. Sample location childrens play area

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Appendix C: Photos Commercial Compost & Mulch Products

Figure 2 – Photos Commercial Compost/Mulch Products

Photo 1. Sugar Cane Mulch, showing health warning

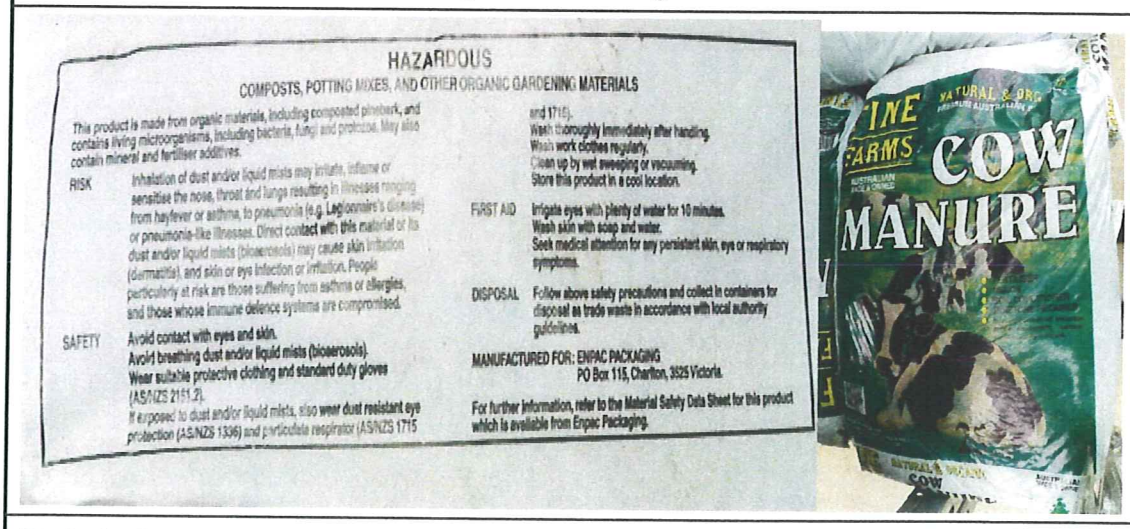

Photo 2. Cow manure, showing health warning

Figure 2 – Photos Commercial Compost/Mulch Products

Photo 3. Organic Garden soil, showing health warning

Photo 4. Potting Mix, showing health warning

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Appendix E: Example Warning Signage

HAZARDOUS

COMPOSTS, POTTING MIXES

AND OTHER ORGANIC GARDENING MATERIALS

This product is made from organic materials, including composted pinebark, and contains living micro-organisms, including bacteria, fungi and protozoa. May also contain mineral and fertiliser additives.

RISK	Inhalation of dust and/or liquid mists may irritate, inflame or sensitise the nose, throat and lungs resulting in illnesses ranging from hayfever or asthma to pneumonia (e.g. Legionnaire's disease) or pneumonia-like illnesses. Direct contact with this material or its dust and/or liquid mists (bioaerosols) may cause skin irritation (dermatitis), and skin or eye infection or irritation. People particularly at risk are those suffering from asthma or allergies, and those whose immune defence systems are compromised.
SAFETY	Avoid contact with eyes and skin.
	Avoid breathing dust and/or liquid mists (bioaerosols).
	Wear suitable protective clothing and standard duty gloves (AS/NZS 2161.2).
	If exposed to dust and/or liquid mists, also wear dust resistant eye protection (AS/NZS 1336) and particulate respirator (AS/NZS 1715 and AS/NZS 1716).
	Wash thoroughly immediately after handling.
	Wash work clothes regularly.
	Clean up by wet sweeping or vacuuming.
	Store this product in a cool location.
FIRST AID	Irrigate eyes with plenty of water for 10 minutes.
	Wash skin with soap and water.
	Seek medical attention for any persistent skin, eye or respiratory symptoms.
DISPOSAL	Follow above safety precautions and collect in containers for disposal as trade waste in accordance with local authority guidelines.
MANUFACTURER	xxxx

For further information, refer to the Material Safety Data Sheet for this product which is available from xxxx.