Appendix Q

Compost Management Plan

Composting Management Plan, Including Management for CA-05 Biosecure Treatment of Phylloxera Host Plant Material for Recycling

Located at the New England Highway, Muswellbrook NSW 2333

On lands described as Lot 3 on DP1193186

Written on behalf of

Bio-Recycle Australia Proprietary Limited

By

The LZ Environmental Company Pty Limited

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Document Control

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Person Responsible

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4	12/08/16	Fourth Issue – minor amendments	Luke Zambelli	John Vyse

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Glossary and Acronyms

AS 4454	*Australian Standard 4454 Composts, soil conditioners and mulches* (Standards Australia Committee CS-037 (Garden Soils and Potting Mixes), 2012)
BOD	Biochemical Oxygen Demand
BPEM	Best Practice Environmental Management
C:N ratio	carbon to nitrogen ratio
CA-05	*CA-05 Biosecure transport and Treatment of Host Plant Material Destined for Recycling or Waste* (Department of Primary Industries, 2013)
CMP	Composting Management Plan
COD	Chemical Oxygen Demand
DAF	Dissolved Air Floatation
DPI	Department of Primary Industries
EM	effective microorganisms
EPA	Environment Protection Authority
EPL	Environmental Protection Licence
FEL	front end loader
GRCF	Greenspot Ravensworth Composting Facility
MPN	most probable number
PIRMP	Pollution Incident Response Management Plan
POEO Act	*Protection of the Environment Operations Act 1997*
POEO Waste	*Protection of the Environment Operations (Waste) Regulation 2005*
Putrescent wastes	Wastes that are already in an advanced decayed state and is highly odorous.
Sensitive receptor	An area or place outside of the Facility where an environmental impact is experienced, such as offensive noise or odour.
SRC	Singleton Regional Council
SOP	Safety Operating Procedure
SGWMP	Surface & Groundwater Management Plan
VFA	volatile fatty acids
VOCs	volatile organic compounds

1 Introduction

The following compost management plan (CMP) has been prepared for Bio-Recycle Australia Proprietary Limited (Bio-Recycle) located at New England Highway, Muswellbrook, NSW 2333 on lands more specifically known as Lot 3 on Plan DP1193186 to cover its obligations under the *Protection of the Environment Operations Act 1997* (*POEO Act*). This tenement constitutes the Greenspot Ravensworth Composting Facility (GRCF), which will also be referred to herein as the 'Facility' or 'site'.

This CMP is controlled by the following listed documents that co-ordinate Bio-Recycle's Quality Management System which has been integrated into its related company, Bettergrow Pty Ltd's Quality Management System:

- The Management System Manual;
- Environmental Management Plan; and
- WHS Management Plan.

It is to be noted that the integrated QA/WHS/environmental management system has been established to meet the requirements of ISO90001: 2008, ISO140001: 2015 & AS4801: 2015 plus WHS and environmental legislation as specified in service delivery contracts from time to time.
This CMP specifically relates to the environmental management of potential impacts associated with the composting process that is to be performed at the Ravensworth facility.

Readers are to note that Bio-Recycle is authorised to receive a variety of waste items as listed in *Section* 6.1 *Wastes Authorised to be Received at the Facility* below for composting in accordance with Environmental Protection Licence (EPL) – 7654 issued by the NSW Government.

This CMP also includes management practices for the *CA-05 Biosecure transport and Treatment of Host Plant Material Destined for Recycling or Waste* (*CA-05*) and for achieving *Australian Standard 4454 Composts, soil conditioners and mulches* (*AS 4454*).

For the purposes of this document the term 'host plant material' refers to garden waste that is or has the potential to be contaminated with Phylloxera.

Bio-Recycle intends to create mineral-fortified and humified compost for use in onsite soil rehabilitation campaigns performed by AGL Macquarie at its Ravensworth No.2 and Ravensworth South mine sites.

Bio-Recycle is approved to receive 50,000 tonnes of various organic wastes per annum for composting.

On occasion greenwaste that is generated within the PIZ that is potentially contaminated with Phylloxera will be received at the facility for treatment. It is understood that Phylloxera does not forage on anything other than *Vitis* species (grape vines and ornamental vines) (National Vine Health Steering Commitee, 2009).

Some of the land immediately surrounding the Ravensworth site is considered to be land effected by mining and it is intended to provide soil conditioners to assist in the repairing of the said soils. Ravensworth is also surrounded by land that is used for the grazing of animals and as such would respond well to additions of compost.

The agricultural land is not used for the growing of *Vitis* species (grape vines and ornamental vines) and as such is not deemed to be a sensitive industry. There are no sensitive receptors located within 1.5 km of the centre of the GRCF as required by clause 6(e)(iv) or 6(f)(i) of *CA-05*. Proof of this is provided in **Appendix 4 – Figure 2** which is a satellite image with a 1.5 km radius overlay centred on the Facility's composting pad.

It is essential that all Facility Employees are aware that within this CMP there are important requirements as part of conducting activities which need to be adhered to so as to assure quality in performance and above all, demonstrate compliance with licence/approval conditions. This CMP is designed to describe the activities that are being conducted as well as day-to-day procedures which when followed will ensure that the GRCF is managed in compliance with all relevant environmental regulations and requirements. Therefore, it is of crucial importance that all Facility Employees are familiar with this CMP in its entirety and the commitments made within it.

Following on from above, it is to be noted that this CMP has been written with guidance provided by the NSW EPA Guideline, titled Composting and Related Organics Processing Facilities 2004.

This CMP is presented with four appendices, specifically, **Appendix 1 – Workplace Procedures** encompassing the stated measures for Facility Employees to comply with when engaged in activities at the Facility in order to ensure that human health and the receiving environment are protected and not negatively impacted.

Appendix 2 contains emergency procedures for certain aspects of the activity that are to accompany the existing Pollution & Incident Response Management Plan prepared by Bio-Recycle. The emergency procedures have been prepared for when employees encounter emergencies such as spills or fires for example. **Appendix 3 – Forms and Checklists** contains the forms and checklists which must be used by the Facility Employees in conjunction with the aforementioned procedures.

Appendix 4 – Figures contains multiple images; the first of which indicates the overall location of the GRCF (refer to **Appendix 4 – Figure 1**). **Appendix 4 – Figure 2** is an image centred on the GRCF

with a 1.5 km radius overlay, which is the sensitive industries exclusion zone stated in *CA-05*. **Appendix 4 – Figure 3** portrays the general layout of the facility located on the surface of the back-filled void space. **Appendix 4 – Figure 4** portrays the gradient of hardstand Pads 1 and 2 whilst **Appendix 4 – Figure 5** highlights the direction of stormwater flow. **Appendix 4 – Figure 6** portrays the Phylloxera Infested Zone (PIZ) of Sydney for reference. **Appendix 4 – Figure 7** is provided that indicates the extent of lease Boundary.

Whilst stormwater and leachate management is addressed within this document, this CMP is further supported by the document titled, "Surface and Groundwater Management Plan (SGWMP) prepared for the Greenspot Ravensworth Composting facility, dated 3.8.16, Version 7".

1.1 Purpose of this Composting Management Plan

The purpose of this CMP is to document and describe management practices conducive to Best Practice Environmental Management (BPEM) that will be adopted for the composting to be conducted at the Facility, in order to reduce or eliminate any risk of the activities causing environmental harm. Furthermore, the purpose of this CMP is to:

- identify the potential environmental harm which may occur from routine operations and establishes and documents measures to avoid this harm as far as practicable;
- identify extraordinary factors (i.e. abnormal operation, emergencies) that may cause environmental harm and establishes and documents contingency plans to deal with these (refer to **Appendix 2** & the attached **PIRMP**);
- ensure all persons carrying out the activity are aware of the environmental risks, and are trained in the measures and contingency plans to deal with them;
- implement monitoring of environmental performance to ensure the effectiveness of the measures and contingency plans;
- assist the communication of environmental information throughout the organisation and to the administering authority; and
- provide for continual improvement.

2 Environmental Commitments and Policy

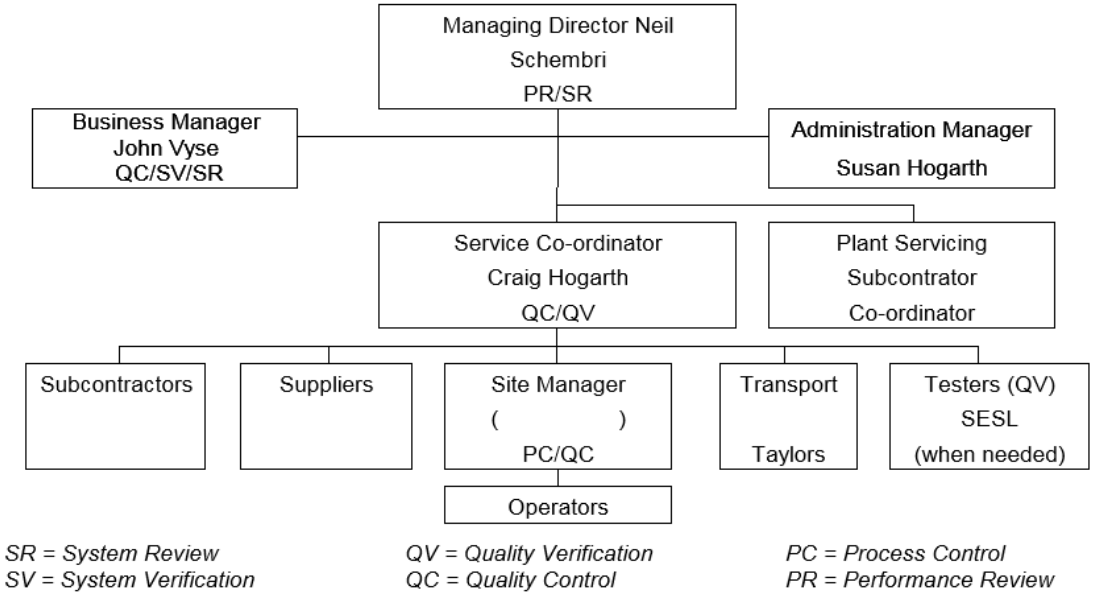
Bio-Recycle is committed to operating in compliance with all environmental limits and operating the GRCF with little or no impact to the receiving environment. Bio-Recycle is also committed to achieving the lowest possible emissions to air and noise environments and the lowest possible releases to the water and land environments within economic reason, while maintaining the minimum level of offsite

complaints regarding composting operations in line with the principles of BPEM. This will ensure that persons are not adversely affected in their place of residence or occupation.

Section 3 below shows the organisational structure that is in place at the Facility to manage the activity. It should be noted that all Facility Employees must be trained in the workplace and emergency procedures contained in **Appendix 1** and **Appendix 2** and are to become familiar with this document in its entirety including the environmental commitments made within. As a special mention and further to **Appendix 2**, employees are directed to the attached **PIRMP** for when responding to emergencies.

Training of the Facility Employees must also be undertaken such that all employees are fully aware of their obligations and duties to ensure that the highest level of environmental protection is maintained. Furthermore, a continuous improvement process is also provided within this CMP, to be adopted at the site to ensure that the above commitment occurs over time, i.e. that the highest level of environmental protection is maintained.

3 Organisational Structure



3.1 General Contact Detail

Table 1: General Contact Detail

	Managing Director	Site Manager	Organics Business Manager
Name:	Neil Schembri	Chris Payne	John Vyse
Mobile:	0419 636 088	0477 344 969	0403 996 518
Phone:	(02) 4587 7852		
Fax:	(02) 4577 2603		
Email:	neil@Bio-Recycle.com.au	chris@bettergrow.com.au	john@bettergrow.com.au

3.2 Roles and Responsibilities

The principal QA/OHS/environmental responsibilities are outlined below. Responsibilities and authorities are defined in more detail in Bettergrow's System Procedures.

3.2.1 Managing Director

The Managing Director is responsible for setting Company quality, safety and environmental policies and objectives and for allocation of resources to each service area.

3.2.2 Organics Business Manager

The Organics Business Manager is the Company's corporate "quality management representative" (ISO9001; 5.5.2), "environmental management representative" (ISO14001; 4.4.1) and "WHS management representative" (AS4801; 4.4.1.2) and has the authority to resolve any QA/WHS/Enviro management system matters.

3.2.3 Site Manager

The Site Manager is responsible for the day to day management of the facility and to implement the requirements of the Organics Business Manager. The Site Manager is responsible for ensuring all onsite employees/operators are well versed in the respective workplace and emergency procedures that are associated with the facility. The Site Manager is responsible for advising the Organics Business Manager of incidents that are likely to cause material harm to the environment. The Site Manager is responsible for ensuring that workplace health and safety is being provided to onsite employees and any visitors that attend the facility.

3.2.4 Administration Manager

The Administration Manager is responsible for managing the Company's administrative / accounting functions, including:

- Debtors and Creditors, all accounts receivable and payable;
- payroll;
- administering legal obligations such as motor vehicle, public liability and workers compensation insurances, registrations and licenses;
- maintaining and updating various registers of staff, plant and equipment;
- workplace injury management;
- secretarial duties.

3.2.5 Service Co-ordinator

The Service Co-ordinator is responsible for managing the delivery of the various organics service and compliance with contract requirements including time, quality, safety, environmental and industrial matters.

The Service Co-ordinator is required to notify the Organics Business Manager of any deficiencies or potential problems with Company procedures. The following table is provided to summarise the key management functions and responsibilities.

Table 2: Key Management Functions and Responsibilities

Function	Managing Director	Organics Business Manager	Service Coordinator	Supervisor
Authorise QA/WHS/environmental policies & objectives	*			
Management system document control		*		
Ascertain customer requirements for planning service delivery		*		
Evaluate suppliers and subcontractors	*			
Manage WHS Consultation		*		
WHS Hazard/Risk Identification & Establish Safety Controls		*	*	*
Prepare Environmental Impact Register & Establish Environmental Controls		*		*

Prepare Service Management Plans		*		
Personnel management and management of training	*	*		
Implement Training		*	*	*
Implement Service Management Plan			*	
Implement WHS Risk Controls				*
Implement Environmental Controls				*
Maintain vehicles and equipment in proper operating condition			Plant Servicing Co-ordinator	
Calibration of inspection & measuring equipment			Plant Servicing Co-ordinator	
Review effectiveness of service delivery		*	*	
Liaise with clients on service delivery issues		*	*	
Resolve service delivery nonconformities		*	*	
Investigate WHS incidents			*	*
Investigate environmental incidents			*	*
QA/WHS/environmental records		*	*	
Initiate corrective/preventive action including authority to temporarily restrict work		*	*	*
Follow through corrective preventive actions and monitor their effectiveness		*		
Internal Auditing		*	*	
Review effectiveness of QA/WHS/ environmental management system	*	*		
Management of industrial relations	*			

3.3 Roles and Responsibilities for CA-05

The below roles and associated responsibilities have been included in line with the recommendations of *CA-05*. One person may carry out the responsibilities of more than one position. The persons who have been assigned roles are listed in *Table 3* below.

Position: Certification Controller

Responsibilities:

- Represents Bio-Recycle during audits and other matters relevant to the CA scheme;
- Ensures that the information and procedures within the CMP cover all Bio-Recycle's requirements under the current CA (Part B);
- Ensures that an up to date copy of *CA-05* is kept in the Site Office;
- Training staff in their responsibilities and duties under this CMP;
- Ensures that Bio-Recycle and its staff comply with their responsibilities and duties under this CMP;
- Taking corrective action if compliance with the requirements of the CMP is not met;
- Ensures all records are collected at appropriate times and kept orderly and accessible for perusal by a representative of the DPI; and
- Ensures that the CMP and its procedures are amended as required and that the DPI are informed of such changes.

Position: Process Controller

Responsibilities:

- Ensures all aspects of the implementation of the CMP are being met;
- Ensures plant and equipment are clean of soil, particularly clays and host plant material contamination;
- Ensures treatment monitoring is undertaken and that records are maintained if applicable;
- Ensures that finished treated product is segregated and secured from unprocessed and in-process materials being composted; and
- Ensures that carriers comply with protocols for carrying host plant material and finished products including covering of their load.

Position: Authorised Dispatcher

Responsibilities:

- Ensures all consignments covered by a Plant Health Assurance Certificate (PHAC) issued by Bio-Recycle under *CA-05* are identified; and
- Maintains copies of all PHACs issued by Bio-Recycle under the CA arrangement.

Position: Authorised Signatory

Responsibilities:

- Signing and issuing the PHAC;
- Ensures that the product certified under the PHAC has been treated and prepared in accordance with *CA-05* and that the details on the certificate are true and correct in every particular.

Position: Transport Coordinator

Responsibilities:

- Ensures all businesses involved in the transport and receival of host plant material and treated product are aware of their responsibilities under the CA scheme;
- Ensures that records associated with the transport of the product are filed; and
- Taking action to ensure the containment and safe disposal of any spillage of product that may occur during transport.

Position: Transport Driver

Responsibilities:

- Understand the requirements of transporting product certified under this CA scheme;
- Ensures bins or containers are clean prior to loading and the load is secured correctly after loading the host plant material for transportation to the Facility;
- Travel by the most direct route to the Facility;
- Report all instances of spillage (en-route) and immediately notifying the Transport Coordinator, and the Accrediting Authority (i.e. the DPI) of any major spillage; and
- Ensure the PHAC is given to the host plant material receival person at the Facility.

Table 3: Responsible personnel

Role	Name
Certification Controller	
Back-Up Certification Controller	
Authorised Signatory	
Additional Authorised Signatory	

4 Phylloxera

Bio-Recycle will possibly receive garden waste contaminated with Phylloxera from the Phylloxera Infestation Zone. Therefore, a brief description of the insect and the method by which it infests and kills plants is provided below.

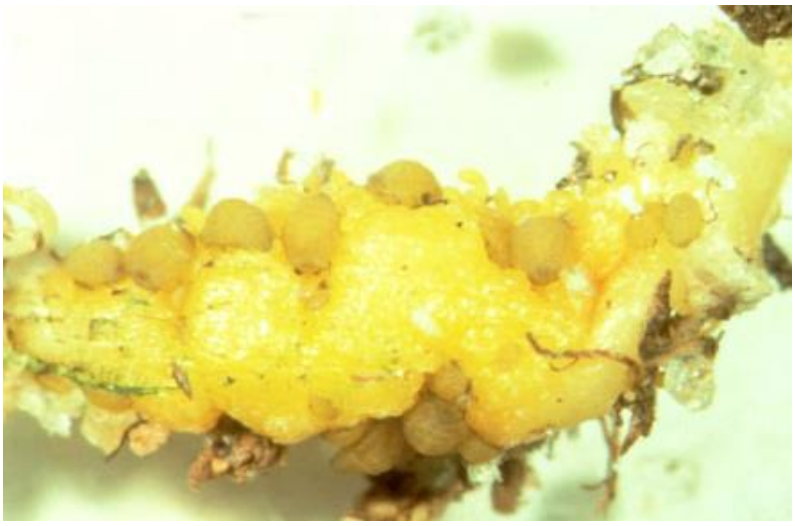
Phylloxera (*Daktulsphaira vitifoliae*) is an aphid-like insect which are approximately 1 mm long and yellow in colour in summer, tending to brown in winter (refer to *Figure 1*). Phylloxera are native to eastern North America (Phylloxera and Grape Industry Board of South Australia, 2005; Phylloxera and Grape Industry Board of South Australia, 2012).

Figure 1: Adult Phylloxera

Source: What is Phylloxera? (Phylloxera and Grape Industry Board of South Australia, 2012).

Phylloxera feed exclusively on *Vitis* species (grape vines and ornamental vines) (National Vine Health Steering Commitee, 2009). Phylloxera feed by puncturing the root surface, where the roots are punctured the vine responds by forming galls (nodosities) on developing fibrous roots which stops the growth of the feeder roots, and indistinct brown warty galls (tuberosities) on larger storage roots which subsequently the roots decay through secondary fungal and bacterial infections. This in combination causes the common grape vine (*Vitis vinifera*) to die (Phylloxera and Grape Industry Board of South Australia, 2005; Phylloxera and Grape Industry Board of South Australia, 2012).

Figure 2: Result of Phylloxera feeding on roots causing galls



Source: What is Phylloxera? (Phylloxera and Grape Industry Board of South Australia, 2012).

According to the Phylloxera and Grape Industry Board of South Australia Phylloxera can spread up to 100 m per year unaided in a vineyard and that it can only survive for a period of 8 days without food, i.e. the common grape vine (Phylloxera and Grape Industry Board of South Australia, 2012).

The Phylloxera and Grape Industry Board of South Australia reported that Phylloxera has a poor tolerance for heat and as such onsite personnel should be confident that if the normal composting regime occurs onsite, then the Phylloxera should be efficiently destroyed.

Moreover, the Phylloxera are soft bodied and are vulnerable to desiccation. Therefore, all host plant material garden waste will either be delivered already shredded (majority of the cases) or will be shredded on the active composting pad prior to being incorporated into an open windrow. The shredding of the host plant material initiates the drying of the garden waste which will assist in the effective treatment of Phylloxera and will minimise the Phylloxera's ability to migrate away from the composting pad.

5 Layout of the GRCF

The GRCF is located upon the back-filled void 3 that was once a part of the former AGL Macquarie Open Cut Mine (refer to **Appendix 4 – Figure 1**). Transport vehicles will access the facility via the access haulage road shown within **Appendix 4 – Figure 7**. Delivery of resources to hardstand Pads 1 and 2 will be via the north-western entrance located at the north-west corner of Pad 1 shown within **Figure 4** of **Appendix 4**.

The Site Office and amenities are located at the western edge of Pad 1 which provides good visibility of the operational area. Raw ingredients such as garden organics and wood waste will be delivered to the western side of the hardstand Pad 1 whereby material will be stockpiled in readiness for use in a compostable blend. Shredded and unshredded material will be stockpiled separately and when enough material is available, a contract shredder will be utilised to grind material. Biosolids will be delivered to the western side of Pad 1 where it will be unloaded on to a bed of greenwaste, mixed to create a homogenous mixture with the appropriate carbon to nitrogen ratio and moisture content and then will be transferred to windrows that run parallel to the gradient of the pad (either pad 1 or Pad 2).

Bio-solids to be air dried will be delivered to the eastern side of the Pad 2 area via the same entrance as described above. Air drying of biosolids will occur below gradient of finished compost stockpiles awaiting transfer to rehabilitation areas. In addition to this, a finished product storage / truck loading area is located in the most northern section of the hardstand area of Pad 2. The general layout of the above mentioned areas is illustrated in **Appendix 4 – Figure 3**.

Composting windrows will be aligned parallel to the gradient of the hardstand pad (refer to **Appendix 4 – Figure 4**).

The hardstand comprises of 400 mm of compacted overburden that has an appropriate grade to shed generated leachate. The material has been tested and displays a permeability that exceeds the requirement of 1×10^{-7} m/s. It is important that gradients are maintained and that no ponding or pooling occurs. Depressions must be filled promptly by using screened or sieved overburden. It is to be noted that the hardstand pad overlays a 30-50m thick mass of fly-ash that displays a permeability of 1.3×10^{-5} m/s – 8.9×10^{-6} m/s. The combined layers provide effective retardation from leachate moving vertically through the profile and releasing to Void 4. It is the intention to further seal the upper surface of the hardstand by utilising drill muds that meet the resource recovery order and exemption. The drill mud will be received and allowed to dry on the hardstand surface where by it can be worked into the hardstand when at the appropriate moisture percentage.

Appendix 4 – Figures 3 and **4** portray the location of the primary leachate detention basin. The bed and banks of the leachate detention basin have been constructed from onsite overburden. Screened or sieved overburden has been placed over the emplaced overburden and again sealed with drill mud so as to achieve a permeability of at least 1×10^{-9} m/s. Results show that 19 mm minus material can achieve the required permeability and it is important that before any repairs occur, overburden is screened.

Appendix 4 – Figure 3 also portrays the location of future Pads 3 and 4 for when the operation is expanded in the future. Whilst not in use however, the areas are to be revegetated so as to minimise soil loss form the said area. It is worth mentioning here that as part of the strategy for the management

of the volume of leachate that is generated at the facility the area represented by the Future Pads 3 and 4 within **Figure 3** will be irrigated from time to time.

The following figure defines the surface areas that are referenced within the Surface and Groundwater Management Plan (SGWMP V7-3.8.16) that is to be read in conjunction with this CMP. It is provided here for reference as it is important to understand that Area 3 and Area 4 below indicate areas where irrigation of leachate could occur.

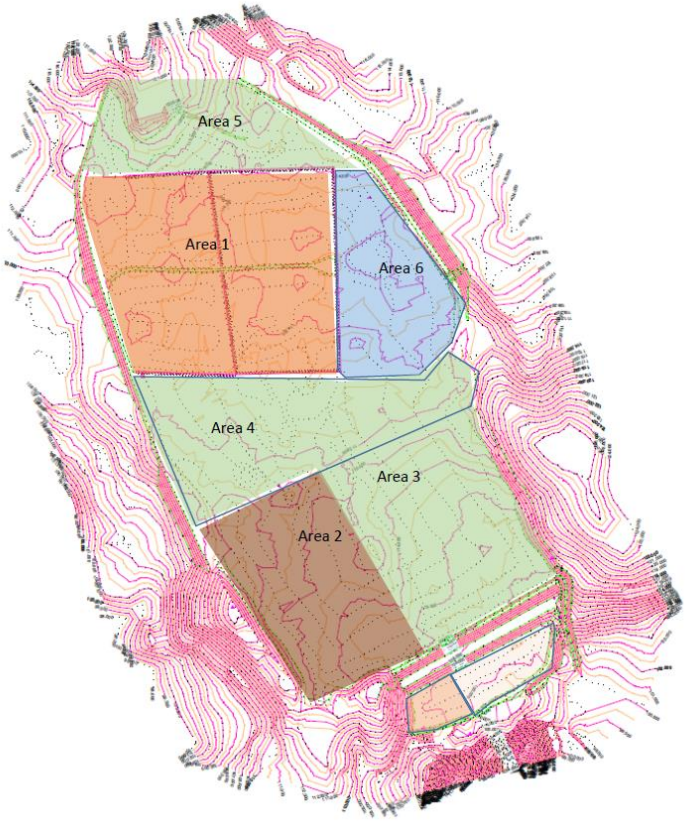


Figure 3: Depicting broad areas associated with Void 3

It is to be noted that Area 1 shown in the image above is to cease as an area where pasteurisation of garden organics has been performed in the past. It is the intention to re-vegetate Area 1 in the future also.

6 Description of Activity

The primary purpose of the GRCF is to create mineral-fortified and humified compost from various waste types. All compost and air dried biosolids produced will be utilised by AGL Macquarie for the purpose of rehabilitation.

The Facility will opened at 6 am Monday to Saturday and will ordinarily commence receiving incoming feedstock at 6.30 am. Similarly, transport of finished product will commence at 6.30 am.

6.1 Wastes Authorised to be Received at the Facility

The GRCF should be considered as a place where wastes are transformed into beneficial products that amenable for reuse. With that in mind, employees must be aware that it is essential that the types of waste accepted are those that are only approved to be accepted.

The person manning the Site Office, the Site Office Operator, must ensure that any necessary documentation is completed or exchanged, including any relevant waste tracking for trackable wastes. A list of trackable wastes and their associated waste tracking codes are provided in **Appendix 1 – Table 3** and **Appendix 1 – Table 4** of the **CMP** for the benefit of GRCF Employees (refer to the **CMP, Appendix 1, Section 2 - Workplace Procedures**).

Waste must be effectively vetted so prohibited wastes are not accepted at the GRCF. Therefore, the Site Office Operator will undertake a visual inspection of the waste being delivered to ensure that the waste intended to be accepted at the GRCF is in accordance with the waste acceptance criteria.

After all relevant documentation has been exchanged and completed, and the initial inspection has been undertaken, the waste transporter must be directed to the relevant Unloading and Mixing Area of the Composting Pad (refer to **Appendix 4 – Figure 3**).

It is essential that all site personnel involved in accepting wastes are aware of the waste types allowed to be accepted at the GRCF and as such the employee who is in charge of supervising unloading must also determine if the waste unloaded meets the description within the waste acceptance criteria. The waste acceptance criteria is provided in the following table.

Table 4: Wastes authorised to be received at the GRCF

Waste Type
Biosolids
Wood Waste
Garden Waste
Grease Trap Waste (treated)
Lime
Fly Ash

Waste that meets all the conditions of a resource recovery exemption under Clause 51A of the *Protection* of the Environment Operations (Waste) Regulation 2005
Any waste received on site that is below licensing thresholds in Schedule 1 of the POEO Act, as in force from time to time

All waste must be unloaded as specified within the relevant workplace procedures (refer to **Appendix 1, Section 2, Workplace Procedure 1 – Waste Receival and Unloading** and **Workplace Procedure 16 – Waste Management).**

In the majority of cases, shredded greenwaste will be delivered to the GRCF. Any unshredded greenwaste must be sorted using a combination of front end loaders (FELs) and designated hand pickers prior to grinding. Sorting and grinding must occur where the unshredded greenwaste is stockpiled on the active mixing pad. Shredded greenwaste will then be utilised in the construction of windrows as described below.

Wastes must be mixed to create a blend suitable for composting and incorporated into a windrow in accordance with **Workplace Procedure 2 - Open Windrow Construction & Maintenance** or (i.e. 45-50% moisture content weight for weight (w/w), carbon to nitrogen ratio 30-25:1 and homogenously mixed) (refer to **Appendix 1 – Workplace Procedures**).

Once unloaded and washed down or out, empty trucks will exit the GRCF via the same route they entered.

In the event that prohibited waste(s) are discovered after unloading has occurred, the offending transporting company must be contacted with the expectation that the waste will be collected and transported to a facility that can legally accept such waste. The EPA will be contacted in such an event and all relevant information regarding the unauthorised delivery supplied.

All new feedstock for composting must be subject to the selection and evaluation process outlined in *Section 6.4 New Incoming Feedstock Selection and Evaluation* below.

It is to be noted that a sample of all liquid waste received at the GRCF must be stored and refrigerated for 30 days onsite. The holding period will provide Bio-Recycle with the ability to analyse received wastes for possible contamination with prohibited substances if composting efficacy is compromised for some unknown reason and/or if unanticipated odour nuisance is experienced.

Once unloaded all wastes must then be mixed to create a blend specifically suited for composting, as defined within **Workplace Procedure 2 –Open windrow Construction & Maintenance** of the **CMP**,

i.e. < 50% moisture content (w/w), carbon: nitrogen (C: N) ratio 30-25:1 and homogenously mixed (refer to **Appendix 1, Section 2 – Workplace Procedures**).

6.2 Composting

After ingredients have been correctly blended, the combined blend will be incorporated into an open windrow whereby the windrow mixture will be subjected to its first pasteurisation phase.

Employees must understand that to achieve pasteurisation, compost must be subjected to a minimum of three turns with each turning event occurring after the compost has been subjected to at least three consecutive days at a minimum temperature of 55°C. The requirement for a minimum three turns is to ensure that all compostable material is subjected to pasteurising temperatures. Also, it is important to mention that to effectively attain pasteurisation, oxygen rich conditions must be present. Windrows that lack oxygen will bread pathogens.

Turning will occur via the use of a front end loader (FEL). Employees are referred to Bio-Recycle's Safe Operating Procedure (SOP) - Front End Loader in this instance for further detail.

It is important to note that it is likely that compost windrows will reach temperatures that are greater than 55^{o}C during the initial 6-8 weeks of the composting cycle a number of times. This is generally dependent upon the type of carbon that is being composted (i.e. softwood degrades quicker than hardwood and as hardwood breaks down more carbon becomes available for conversion into humus). It is essential that when open windrows reach 62^{o}C or a maximum of 67^{o}C, the windrow must be turned so as to dissipate heat and to provide essential oxygen for aerobic (air loving) bacteria to continue the aerobic decomposition of organic matter/waste.

Once compost windrows have achieved 8 weeks of composting, they will then enter the maturing phase.

After maturation has occurred, composted material will be screened and blended with other materials/products so as to create the desired product. All recipes will be set by management and it is imperative that recipes are adhered to. It is to be noted that there will be no compromise on producing a quality product and deliberate undesirable changes will not be tolerated.

Once this has occurred, desired material will be transported to the final storage and load out area located at the north-eastern end of Pad 2(refer to **Appendix 4 – Figure 3**).

It is to be noted that oversize compost will be utilised within initial mixes so as to seed the compostable medium with beneficial micro-life. This will accelerate the initiation of composting and will also allow micro-life to feed off absorbed water soluble VOCs, contained in the blends free moisture.

All windrows must be constructed so as to run parallel to the stormwater flows (refer to **Appendix 4 – Figure 4 and Figure 5**). This will minimise the transport of leachate and gross solids to the onsite basins.

Each composting windrow must be assigned a unique identification number so that the pasteurisation/treatment of wastes (specifically host plant material) can be effectively tracked. The temperature, carbon dioxide level and moisture content of the composting windrows will be monitored on a daily basis in accordance with **Workplace Procedure 5 – Temperature Monitoring** and **Workplace procedure 6 – Carbon Dioxide Monitoring** (refer to **Appendix 1 – Workplace Procedures**).

Further detail on the fundamentals of composting, such as temperature, moisture control, the choice of what carbon to nitrogen ratio will apply based on end type of product being created, aeration and homogenous mixing, as well as the composting method adopted at the Facility, readers should refer to *Sections 9 Fundamentals of Effective Composting* and **Workplace Procedures 2, 4, 5** and **6** for further detail.

Once the compost is finished (pasteurisation complete) it must be stored on the hardstand pad on which it was created to mature. The temperature of finished compost windrows must continue to be monitored weekly to ensure that reheating should not occur (refer to **Appendix 1, Workplace Procedure 5 – Temperature Monitoring**). Ideally the finished compost windrows should approximate to the ambient air temperature before being transferred for use. This will ensure that a superior quality of compost is produced.

After the maturation period, the finished material can be transferred to the finished product storage / truck loading area at the northern end of Pad 2.

Prior to removal of material from site **Form 14 – Treatment Record** must be completed for each finished windrow and **Form 12 – Temperature Profile** kept for each windrow must be attached to the former form as proof of pasteurisation/treatment (refer to **Appendix 3 – Forms and Checklists**).

Immature compost that may still contain pathogens will not be transferred to the finished stockpile storage area. Facility Employees must therefore be able to determine when compost is finished. Personnel will be made aware of the tendency for compost to rapidly reheat upon sufficient wetting and aeration when unfinished. When moisture levels become critically low in the composting process, microorganism activity decreases. Due to this inactivity, a false reading of temperature could be obtained, indicating that the compost is finished, but in actual fact, this is caused by a lack of moisture.

It is important to keep mature windrows aerobic and moist as they are a living mass of beneficial micro-organisms. As such, it is better to retain mature compost on hardstand pads until it is ready to be

transferred to the finished product storage / truck loading area where stockpiles can revert to anaerobic conditions over time due to the asphyxiation of aerobic micro-life. Windrows must be turned a minimum of once a week for aeration whilst maturing and regularly wetted to maintain effective populations of aerobic bacteria in the compost.

The amount of water or leachate applied to the windrows should ensure that the moisture content of the finished compost does not exceed 40% w/w. The windrows must be regularly observed for signs of excessive heating and spontaneous combustion, including smoke, charring and burning odours (refer to **Appendix 1, Workplace Procedure 3 – Finished Compost Stockpile Management** and **Workplace Procedure 7 – Spontaneous Combustion Prevention**).

So as to gain an appreciation for open windrow composting to be conducted at the GRCF, the following section is provided.

6.2.1 Open Windrow Composting

One must understand that open windrow composting uses heat generated from microbial activity to reach pasteurising temperatures of above 55°C to effectively kill weed seeds and at successively higher temperatures pathogenic bacteria and microorganisms are also destroyed. The aerobic decomposition process employed provides a favourable balance of beneficial aerobic bacteria and fungi. This is an important process that results in aerobic microbes outnumbering undesirable anaerobic and often pathogenic microorganisms. Aerobic processes will amongst other things, determine whether a final blend can be utilised for unrestricted or restricted use in normal commercial composting, e.g. whereby E. coli should be less than 100 most probable number (MPN) per gram and Salmonella species should be not detected in 50 grams of final product for unrestricted use (refer to **Appendix 1, Workplace procedure 8 – Quality Limits Sampling**).

Anaerobic conditions should be discouraged in aerobic windrows and therefore must be avoided using all reasonable and practicable measures. Amongst the important reasons for this, is that when compost becomes predominantly anaerobic, the potential for odour liberation is greatly increased, which may cause environmental nuisance. Moreover, once temperatures within a composting windrow are above 67°C, beneficial microorganisms are usually destroyed and undesirable (anaerobic) micro flora and fauna will begin to predominate.

The personnel at the Facility must understand that it is essential to ensure that temperatures within windrows do not exceed 67°C to ensure beneficial microorganisms, including bacteria, fungi, protozoa and beneficial nematodes, are not destroyed. If the windrow temperature exceeds this temperature, even for a short period of time, it could kill off the bulk of beneficial microorganisms and subsequently

this will impact the aerobic composting process and could lead to anaerobic conditions pre-dominating in the compost windrow. This in turn may give rise to the release of unpleasant odours associated with anaerobic microorganisms and will detrimentally impact the composting process.

Whilst moisture is essential for composting, when windrows become excessively moist, one must understand that diffusion of oxygen becomes significantly reduced. Whilst appropriate moisture levels are provided at the commencement of composting, rainfall events can cause saturated environments whereby windrows revert to anaerobic activity. Under these circumstances the measures detailed in **Workplace Procedure 14 – Rain-Induced Anaerobic Windrows** must be followed, to re-introduce conditions favourable for aerobic decomposition within the windrow (refer to **Appendix 1 – Workplace Procedures**). These measures are in accordance with the writings of Professor Elaine Ingham in the publication "*The Foodweb in Compost*" (Ingham, 2004).

In order to maintain the correct composting temperature, temperature profiles must be taken every day initially until the temperature cycle of a specific compost mixture (recipe) is understood (refer to **Appendix 3, Form 11 – Temperature Monitoring Record**). A full comprehension of how a particular compost mix behaves during the compost cycle (over 8-12 weeks) may take up to 12 months due to the differing seasons prevailing at any given time of the year (i.e. ambient temperatures, wind conditions, rainfall frequency, intensity and duration, humidity and solar radiation). This timeframe may be reduced if more frequent and detailed monitoring can be performed. **It is important to aim for a maximum temperature limit of 62°C within aerobic windrows.** It is to be noted that **Form 12 – Temperature Profil**e is provided for the recording of the averages of temperatures obtained from a discrete windrow and recorded with **Form 11**.

Uncontrolled or rapid temperature increases during the composting process indicates it is likely that too much nitrogenous based waste has been added to the starting mixture, which is undesirable as this could also lead to "ashing", a pre-condition to spontaneous combustion. Therefore, it is essential that carbon: nitrogen (C: N) ratios of wastes and compost mixtures incorporating waste materials are fully understood prior to the creation of a windrow. The desired range for efficient composting to occur is 25-30 (carbon):1 (nitrogen). C: N values which are significantly lower than this range e.g. at 15:1 or lower also have the propensity to release ammonia, amine and manure type odourants.

The desired C: N ratio provides conditions ideal for enhanced microbial function in degrading organic substrates. If windrows are too high in carbon content the composting process is significantly slowed and because the temperature profile indicates a significant cooling, may give the impression that the composting process has ended. This can be demonstrated when a composting windrow with a high C: N ratio, which is considered to be "finished", is treated with a nitrogenous base liquid and the composting process is re-initiated as evidenced by an increasing temperature profile i.e. the composting

process had not finished. This is not to be confused however with the creation of mulches which typically utilise low levels of nitrogen to create a desirable product.

The generation of an excessive amount of heat must be avoided to minimise the risk of a spontaneous combustion fire occurring.

According to the composting and recycling journal titled "*Biocycle*", spontaneous combustion is often thought of as a single process. However, spontaneous combustion is actually a chain reaction of several different heat-generating processes (Rynk, 2000).

Whilst the heat source required to initiate a fire is not directly attributable to the heat generated from microbial activity, it is excessive heat generated from microbial activity that generates enough heat for certain chemical reactions to start. It is these chemical reactions that release heat which can eventually start conditions of smouldering. Whilst the temperature required for the auto-ignition of methane (a by-product of anaerobic digestion) is high (approximately 580°C), other molecules or by-products of heat generating reactions cause the windrow to heat. The chemical processes include chemical oxidation, slow pyrolysis, and absorption or condensation of gases within dry charred particles (e.g. ashing) (Rynk, 2000).

This complex mixture of trapped gases (anaerobic by-products) and heat generated from the associated chemical reactions contained within a large windrow mix, sustains smouldering. An introduction of oxygen at this time (e.g. opening up a windrow) will ignite a flame and spontaneous combustion will proceed.

During open windrow construction special attention must be given to avoiding excessively wide or tall open windrows as this retards air convection and the drawing in of oxygen through the windrow profile. The dimensions of open windrows will typically be 2.5 m high x 4 m wide x 150 m long.

If windrows are constructed that are significantly wider at the base or taller, there is considerable risk that the windrow will tend towards anaerobic decomposition and is likely to release offensive odours and ultimately a sub-standard quality and problematic compost product.

It is often time-consuming and risky to manage hot (> 62°C) open windrows, as they require constant observation and management action. If excessive heat is observed (> 67°C), windrows must not be opened until the heat is dissipated by sprinkling water over the windrow. Moreover, **Workplace Procedure 5 - Temperature Monitoring, Workplace Procedure 6 – Carbon Dioxide Monitoring** and **Workplace Procedure 7 – Spontaneous Combustion Prevention** must be followed.

Similarly, too much liquid may create predominantly anaerobic conditions. To minimise this risk, windrows must not be greater than 50% w/w with regard to moisture content. If rainfall events occur

and the windrows become saturated, excess moisture must be absorbed with dry sawdust, greenwaste or soil from the outside perimeter of the windrow before mixing, to induce aeration.

The above issues amongst others are highlighted in the relevant workplace procedures and detailed stated measures are given for employees to understand and manage environmental issues (refer to **Appendix 1 – Workplace Procedures**).

6.3 Management of Host Plant Material

Whilst not fundamentally different from the gardenwaste that is received from areas located outside the phylloxera infested zone (PIZ) (refer to **Appendix 4 – Figure 5**), special mention is made of the management of host plant material.

As host plant material will on occasion be accepted at the GRCF a vegetation-free buffer zone must be maintained on and around the hardstand pads, such that no vegetation is allowed to grow in close proximity to the designated areas for unloading, mixing, composting or soil blending. A minimum 10 m buffer distance must be maintained between any material on the pads and the edge of the respective hardstand pad at all times, including raw wastes and the compost windrows.

Furthermore, from the receival of wastes and through and after composting (all phases), emphasis must be placed on preventing cross-contamination to ensure that all material is subject to complete pasteurisation. *Section 8 Cross-Contamination Prevention and Washdown* below outlines the control measures and management procedures which minimise or prevent cross-contamination.

Similar to the information provided above, when waste delivery trucks transporting host plant material arrive at the Facility they will report to the site office upon entry to the site. The Facility Employee manning the site office must ensure that all necessary documentation is inspected and exchanged regarding the waste load; including completing **Form 3 – Record of Receipt of Host Plant Material** and retaining a copy of the Plant Health Assurance Certificate (PHAC) for any incoming host plant material (refer to **Appendix 3 – Forms and Checklists**). The description of the waste on any documentation must be consistent with the waste acceptance criteria for the Facility (refer to *Section 6.1 Wastes Authorised to be Received at the Facility*). Directions must be given to the waste delivery driver to the appropriate hardstand pad for unloading.

The Facility Employee supervising unloading must direct the waste delivery driver to the designated unloading area of the respective hardstand pad and give any additional unloading instructions required. During unloading the load must be inspected to ensure that prohibited wastes, wastes which Bio-Recycle is not approved to receive, are not accepted at the Facility. If prohibited waste is discovered during unloading, the waste must be reloaded into the waste delivery vehicle and transported (at the Transporter's expense) to an alternative facility that can lawfully accept such waste (refer to

Section 11.5.1 Prohibited Waste Management). A PHAC must be completed for any prohibited waste that is or is potentially contaminated with Phylloxera when it is removed from the Facility.

Ordinarily, trucks will wash out residual waste from containers on a bed of greenwaste which will be incorporated into the compostable mix being created. Ordinarily, trucks will wash down the outside of vehicles at the designated wash-down bay located on the hardstand pad prior to exiting the facility.

Similarly, when unloading of host plant material is complete the waste delivery vehicle must perform a wash-out of the container utilised to transport the host material if it is the fact that the container will be immediately utilised for another type of waste or product that could result in cross contamination.

Whilst trucks will ordinarily wash-down the outer sides of vehicles and containers at the above mentioned designated wash bay, trucks that have transported host plant material from the PIZ will be required to wash-down the outside of their trucks, containers, wheels and undercarriage etc. at the same location as where the wash-out of the container occurred. This is to stop the potential for loose host plant material being spread during transport.

Wash-down waters that have seeped through the bed of greenwaste must be directed to the respective leachate/stormwater basin. The exterior of the truck must be washed down with a high pressure cleaner, with particular attention being afforded to the wheel guards, the underneath and upper body of the vehicle where waste may have spilt or splashed onto the external surface. Once the truck has been inspected and made free of plant material and soil it can exit the hardstand pad and leave the Facility via the same route that it entered. All inspections must be recorded using **Form 16 – Equipment Inspection Record** (refer to **Appendix 3 – Forms and Checklists**).

As mentioned previously, composting windrows that contain host plant material must be subject to pasteurisation in accordance with the requirements of *CA-05* and *AS 4454*. **The pasteurisation temperature must be adjusted in accordance with the accuracy of the thermometer(s) as outlined in *Section 7 Temperature Monitoring Equipment* below**.

As mentioned earlier, temperatures within windrows that contain host plant material must not be allowed to rise above 67°C, with a preference for turning to occur at 62°C. If elevated temperatures do occur, the windrows must be managed as outlined in **Workplace Procedure 5 – Temperature Monitoring** to cool the material in the windrow (refer to **Appendix 1 – Workplace Procedures**). Excessively hot windrows (> 67°C) must be managed in accordance with **Workplace Procedure 7 – Spontaneous Combustion Prevention** (refer to **Appendix 1 – Workplace Procedures**).

A unique numbering system must be utilised so as to identify which windrows contained host plant material. If it is possible or likely that host plant material could be blended through a number of

windrows, consideration should be given to tracking all windrows as if they all had host plant material present. This will minimise possible administration errors.

All consignments of finished compost that once contained host plant material must be accompanied by a PHAC. This will ensure that all wastes that are composted at the Facility are subjected to the necessary pasteurisation requirements. The PHAC must be completed in accordance with *Work Instruction 01 Guidelines for completion of Plant Health Assurance Certificates* (Department of Primary Industries, 2012). Books of pre-printed PHACs are available from the Plant Biosecurity sector of the DPI.

6.4 New Incoming Feedstock Selection and Evaluation

From time to time, new wastes may be presented to the GRCF as possible feedstock for composting. The selection and evaluation of new potential feedstock must follow a step by step assessment which is designed primarily to ensure that the integrity and efficiency of the composting process is maintained, and to prevent any environmental impacts as a result of accepting, handling, managing and composting the said feedstock. This evaluation process must be supervised by a suitably qualified person. Outlined below are the five stages of the selection and evaluation process for all new feedstock at the GRCF:

1. **Waste generation investigation** – the waste generator (i.e. the consignor of waste) must be consulted as to what the pertinent characteristics (physiochemical) of the waste are and how it is generated – i.e. the waste is "characterised" to determine if it is a suitable waste that can be considered for inclusion in the composting process. This includes ascertaining whether the waste contains prohibited contaminants and/or large physical objects that may interfere with the homogeneous mixing of the contaminated material.

   In some instances this may require inspection of the facility where the waste was generated and the Site Manager in concert with the suitably qualified person must determine if this is required. If inspection of the generating site is required this investigation will also aid in the assessment of the suitability of the waste to be handled onsite, particularly in relation to its chemical and physical stability.

   Pertinent questions may be required to be answered when assessing the suitability of a certain waste type. **Form 26 – New Incoming feedstock Selection and Evaluation**.

2. **Waste composition review -** If considered necessary by the suitably qualified person, the waste generator must be requested to provide physiochemical analysis (by a NATA approved laboratory) of the waste. This might occur if the suitably qualified person, upon receival of the above information from the waste generator, feels that there is a risk of the waste containing prohibited substances.

Bio-Recycle must seek the advice of appropriately qualified consultants if there is any doubt that the feedstock can be used in the composting process.

3. **Compost recipe formulation –** if the waste is determined to be suitable for composting with regard to the above considerations, the waste is considered for inclusion in composting and a trial treatment formulation is developed by the suitably qualified person.

4. **Request from EPA to perform a trial** – after steps 1-3 have been completed a letter of request is to be sent to the EPA seeking permission to perform a trial. The permission must include detail as to why it is believed that the said material is suitable for acceptance. It is to be noted that in some instances EPA may require a variation application to be submitted.

5. **Trial design and evaluation** – once approval to perform a trial has occurred, a specific quantity of the waste is to be accepted at the GRCF for inclusion in composting and must be managed in accordance with the relevant workplace procedures.

   The minimum volume of the feedstock to be accepted must be sufficient to make up a single windrow (2.5 m wide × 1.5 m high × 30 m long) at the rate prescribed in the trial recipe formulation devised. All inputs, including additions of moisture, to windrows will be recorded.

   The trial windrow(s) will be assessed and measured over a minimum four month period. An efficacy report will be written by the suitably qualified person which demonstrates the final products conformance with the specifications for onsite use, offsite unrestricted or restricted use.

6. **Written notification of acceptance or refusal** – based on the evidence of the efficacy report the Site Manager will send written notification (letter, email or fax) to the client of the GRCF's ability to accept the feedstock for composting. If the ability exists to compost the said material, a request to vary the EPL will occur to include the said waste to the existing waste acceptance list prior to the ongoing acceptance of the trialled material.

7 Temperature Monitoring Equipment

All composting windrows must be subject to pasteurisation, which incorporates the windrow being subjected to a minimum of three turns with each turn occurring after the windrow has been subjected to a minimum temperature of 55°C for three consecutive days in accordance with the requirements of *CA-05* and *AS 4454*. *CA-05* requires that the thermometers utilised for the temperature monitoring of host plant material be accurate to within ± 1% of the treatment temperature (refer to *CA-05, Section 8.7 Temperature Sensing and Recording Equipment*).

However, if this accuracy cannot be attained the pasteurisation temperature must be adjusted in accordance with the accuracy of the thermometer to ensure that in actual fact the above pasteurisation

temperature (i.e. 55°C) is achieved. For instance, if a thermometer has an accuracy that is greater than ± 1% over the calibrated range but is less than 2%, then the pasteurisation temperature must be increased to 57°C to ensure pasteurisation has indeed occurred.

The thermometers used for temperature monitoring must be calibrated a minimum of every six months and the information outlined in **Form 22 – Calibration Record** must be recorded after each calibration event (refer to **Appendix 3 – Forms and Checklists**). The calibration can be undertaken by a Facility Employee in accordance with the manufacturer's specifications or by an authorised service representative.

8 Cross-Contamination Prevention and Washdown

Employees must be aware that Cross-contamination is the process by which contaminated material (including Phylloxera host plant material) is unintentionally transferred from raw wastes or unpasteurised material to material which has progressed further along in the composting cycle and/or finished compost.

This occurs at composting facilities through two key mechanisms:

- raw wastes or unpasteurised material is transferred to mature composting material or finished compost in stormwater flows; and
- the use of vehicles, containers, plant and equipment contaminated with raw wastes or unpasteurised material to manage more mature composting material or finished compost without being cleaned down between uses.

Windrows must be positioned parallel to the gradient of the hardstand surface (i.e. in an east -west alignment). Windrows or stockpiled material must not be emplaced such that stormwater is retarded and misdirected. For further information on stormwater management readers are directed to *Section 11.2 Water Management* below to prevent stormwater cross-contamination.

Raw host plant material must not be added to windrows that are effectively being pasteurised or have been determined as being pasteurised.

All finished compost must be stored up gradient of immature compost or the surface of the hardstand pad must be shaped such that cross contamination induced by stormwater flow does not occur.

Furthermore, and so as to prevent cross-contamination, vehicles, containers, plant and equipment (including monitoring equipment) should be used to manage, move or monitor the finished compost first and then moving from the most mature to the least mature composting material. This will minimise the time and cost required for the washing down of plant and equipment. However, if the vehicle/container/plant/equipment is needed to manage raw wastes or unpasteurised compost before

more mature composting material or finished compost then the said plant or equipment must be washed down and made free of soil and plant material between uses.

Consideration must be given to utilising a steam cleaner (if considered necessary) for the washing down/decontamination of plant or equipment potentially contaminated with Phylloxera, as they have limited resistance to increased temperatures.

If cross-contamination does occur the contaminated material must be reclassified as raw material and constructed into a newly formed windrow(s) and subject to pasteurisation again from the start.

9 Fundamentals of Effective Composting

Bio-Recycle is solely interested in creating composting products using best practise methods. As such it is essential that composting methods are properly controlled. The main principle in creating humified compost is that the composting process is not predominated by anaerobic decomposition. Anaerobic activity is likely to occur in some discrete localised areas of the compost windrows due to the nature of decomposing material present, however, the compost blend within any windrows must never be allowed to become predominantly anaerobic.

The following sections provide key insight into the most important parameters that are essential for producing compost in a suitable manner such that it is deemed nutrient rich with balanced physiochemical properties that provides the most benefit for its designed use. Perhaps the two most important indicators of effective composting are an adherence to a strict temperature regime and adequate moisture content. *Sections 9.1* and *9.2* below outline why these two parameters are of importance and must be given particular attention when performing composting.

9.1 Temperature

It must be understood that allowing compost to generate excessive heat can initiate heating reactions that are a precursor to spontaneous combustion. Attention must therefore be given to temperature profiles throughout windrows to prevent this occurring. Temperatures that are greater than 62^{o}C within compost start to become uncomfortable for a range of beneficial micro-life present. Increasing temperature also results in lower oxygen concentration present within the micro-film of water that aids in aerobic bacteria movement and also respiration. As such temperatures must not be allowed to increase above 62°C with an absolute maximum of 67^{o}C. This will ensure that gaseous releases from the decomposition of waste do not react and create further heat and that the beneficial micro-flora and fauna do not cyst or lay dormant for an extended period of time or die.

The following bulleted points highlight the temperature monitoring regime of the open windrows and what control measures are to be taken if the returned temperature values are above 62°C:

- Temperature profiles for each compost windrow must be taken at four (4) equidistant places along the length of the windrow and at three (3) equidistant depths from the centre of the windrow to within 3 inches of the outside of the windrow (refer to **Appendix 1, Workplace Procedure 5 – Temperature Monitoring**). The temperatures taken at these locations must be recorded and averaged for each windrow using **Form 11 – Temperature Monitoring Record** (refer to **Appendix 3 – Forms and Checklists**). The daily average temperature for each windrow must be recorded using **Form 12 – Temperature Profile** (refer to **Appendix 3 – Forms and Checklists**).
- Windrows can be turned when they have been above 55°C for three consecutive days. This practise will ensure that the all material in the windrow is subject to pasteurisation as required by *CA-05*. **The pasteurisation temperature must be adjusted in accordance with the accuracy of the thermometers used for temperature monitoring (refer to *Section 7 Temperature Monitoring Equipment* above).** At no stage should windrows be allowed to reach temperatures greater than 67°C.
- If windrows do not reach a temperature of 55°C, there is a possibility that not enough nitrogen has been mixed homogenously through the mixture, not enough moisture is present or it could mean that something antagonistic has been added to the starting mixture. In the case of nitrogen deficiency, refer to *Section 9.3 Carbon to Nitrogen Ratio* below for direction.
- If temperatures are high (> 67°C) and anaerobic activity is present, there is an increased chance of spontaneous combustion occurring due to potential smouldering conditions existing that may ignite in the presence of oxygen once a windrow is opened. To reduce the risk of this occurring, prior to turning the windrow water must be added to dissipate the heat in the windrow. The additional water added for this purpose could promote further anaerobic decomposition which will result in a poor quality product being produced which contains undesirable micro-flora and fauna. This will be addressed by reforming the windrow with raw inputs.

  Unfortunately there is no way to short circuit this. As a result, the windrow has to be considered as a fresh windrow. If reforming has to occur, this can be achieved by the addition of inert material (e.g. soil or sawdust) or additional compost to absorb excess moisture and to maintain a moisture value of no greater than 50% w/w within the windrow. It is essential that when required, nitrogen is also introduced when the windrow is reformed.

- It is recommended that finished compost is also added if reforming has to occur so as to restimulate the composting process, as any excessive heat that has occurred may have locally destroyed beneficial bacteria, fungi, protozoa and nematodes, which are all essential for a

balanced and complete ongoing composting process and the building of a beneficial humus substrate.

9.2 Moisture

Whilst the correct level of moisture is essential for creating an environment that is beneficial for microorganisms to flourish, too much moisture can cause the proliferation of anaerobic bacteria (which gives rise to anaerobic decomposition processes) that may result in a release of offensive odours. It is reasonably expected that micro-clusters of anaerobic microorganisms will exist within some locations of the windrows. However, whilst the moisture content is properly controlled, aerobic activity will predominate within the windrow.

The moisture content can be adjusted within the windrow by sequentially adding known volumes of liquid to obtain the appropriate moisture content of 45-50% w/w. This can be determined in the field by tightly squeezing a handful of compost; the release of one drop of moisture from the compost matrix closely approximates a 50% w/w moisture level.

Alternatively, the moisture content can be measured using an appropriately calibrated moisture probe or by weighing the compost before and after drying within an oven. In order to dry the compost in an oven, the air temperature should be held at 65°C for 4 hours. Appropriate personal protection equipment (PPE) in the form of disposable chemical resistant gloves, a long sleeved shirt and appropriate eye protection must be worn when undertaking moisture monitoring. Moisture content determinations must be conducted by site personnel on occasion.

Bio-Recycle recognises the benefits of properly containing and managing leachate (including retaining valuable nutrients and beneficial microorganisms). Therefore, any leachate (excessive moisture emanating from the base of a compost windrow) must be promptly mopped with sawdust, finished compost and/or soil, and then incorporated in the respective windrow.

9.3 Carbon to Nitrogen Ratio

Compost with a high nitrogen value can only be created from high quality nitrogen containing wastes. Wastes with too much ammonia may not achieve the same result when compared to the same material that has not converted the majority of its nitrogen to ammonia as the nitrogen has volatilised and as such the required nitrogen value has been reduced for effective composting to occur. To produce a high quality compost product that aids in providing nutrients to plants, it is of paramount importance to ensure that the carbon to nitrogen (C: N) ratio is optimal throughout the composting process. The Division of Soils at CSIRO has reported in *Composting: Making Soil Improver from Rubbish* that microorganisms need both carbon and nitrogen to make protein (Handreck, 1978). Bio-Recycle has found that an initial C: N ratio of approximately 30-25:1 is required for effective composting.

For example, sawdust may have a carbon content of 35 g per 100 g of total material and a nitrogen content of 0.07 g per 100 g of material. Similarly, cattle manure is in the order of 20 g of carbon and 1.7 g of nitrogen respectively per 100 g of material. If cattle manure and sawdust are mixed together at a ratio of 1.75:2.5, a C: N ratio of 25:4 is obtained, which is in the desired range. Further additions are made to reach the ideal 25:1 ratio. Bio-Recycle holds the intellectual property of the carbon and nitrogen values for the varying waste inputs, and the "recipes" it uses to create good compost (i.e. nutrient rich, with balanced physiochemical properties). The nitrogen sources contained in the various authorised waste streams are added to ensure that C: N ratios are in accordance with an efficient composting process to produce proprietary products for re-sale.

If a compost windrow does not reach the pasteurisation temperature then this is possibly due to a nitrogen deficiency. The windrow should be reformed with additional nitrogenous waste (such as biosolids and/or animal waste) so as to initiate composting. Care must be taken when opening the windrow as volatile odours could be released due to the initial detoxification phase not reaching the required temperature. If when opening the windrow volatile odours are experienced, care must be taken so as to not create a large surface area of volatilising material. In this instance small volumes should be extracted from the windrow and remixed. This should continue until the windrow has been subject to complete mixing. A sample must also be taken of the mixture and tested for its carbon and nitrogen content.

9.4 Aeration

The provision of oxygen to the windrows allows for the proliferation of aerobes, which are beneficial to the process for the reasons described above and importantly are not likely to generate odours caused by anaerobic microorganisms. Conversely under anaerobic conditions (when oxygen is insufficient in a windrow) nitrogen, sulphur and phosphorus compounds are liberated during decomposition, with the potential for odour releases beyond the boundary of the site which might cause odour nuisance. Temperatures that are excessively hot will result in less oxygen being present within the water film that allows microbial movement and respiration. Therefore, it is important to understand and recognise the benefits of providing aeration to the compost windrow, which are listed below:

- Aeration cools the windrow by breaking up concentrated pockets of microorganisms and through the introduction of cooler air;
- Aeration assists in both the mesophilic and thermophilic microbial processes essential for achieving an optimum compost product;
- Aeration ensures the mixing of organisms with the food resources available; and

- Aeration prevents the proliferation of anaerobic microorganisms which minimises the likelihood of causing environmental nuisance or deleterious conditions to soil in which the compost is applied.

9.5 Homogenous Mixing

When creating a compost windrow a homogenous mixture of input materials must be prepared. Attention must be given to creating a blend that is homogenously mixed including the incorporation of the following ingredients:

- The introduction of proprietary products such as Bioaktiv, humates or fulvates;
- The inoculation of microbes via liquids;
- The mixing of liquid wastes;
- The mixing of solid wastes such as biosolids or manures; and
- Incorporating greenwaste, sawdust or other predominantly carbonaceous material into the mixture.

It should be noted that the mechanical turning regimes provides efficient aeration to each windrow and also ensure that a proper homogenous mixture is created. Any inadequacies in the initial mixture are likely to be ameliorated when the first turn occurs. It is to be noted that the first turn cannot occur until a temperature of 55°C (or 57°C if temp probe has +or – 2ºC accuracy – refer to *Section 7 Temperature Monitoring Equipment*) has been attained and held consecutively for three days. This period is essential whilst the windrow goes through the initial detoxification phase. Opening the windrow before this temperature has been attained and maintained may result in offensive odours being released.

Prior to the unloading of liquid wastes, a tight four-sided greenwaste bund must be constructed. The bund must also have greenwaste at the base so as to absorb liquid and protect the hardstand. All liquid waste must be emptied into the said bund. As such the bund must be made large enough to accept the load. The liquid waste can then be unloaded into the bund. If any waste overtops or breaks through the bund unloading must immediately cease until the bund is reformed and any spilt waste is effectively isolated and cleaned-up via dry methods in accordance with Emergency Procedure 2 – Spill Management (refer to **Appendix 2 – Emergency Procedures**). Therefore, supervision must be provided so that corrections can be promptly made. When mixing occurs, greenwaste bunds must not be broken into or moved until enough absorbent material has been placed over the top of the retained liquid waste.

10 Identification of Environmental Impacts

It is important that Facility Employees are aware of the potential environmental impacts that could arise if the procedures and protocols highlighted within this document and in the workplace procedures contained within **Appendix 1** are not properly implemented or followed.

The potential actions or conditions which could result in these environmental impacts are also summarised in the subsections below so that Facility Employees can appreciate that due care must be taken when performing their respective duties.

10.1 Air Impacts

If not properly managed, the activities at the GRCF have the potential to cause environmental harm or nuisance as a result of uncontrolled emissions to air that leave a Facility and which are deposited at an odour or dust sensitive receptor. The time of day and prevailing wind conditions plays a major role in whether or not dust, particulate matter or odour emissions will result in environmental harm or nuisance at a remote sensitive receptor.

A level of awareness and understanding of these conditions will assist personnel when responding to a release to the air environment in order to prevent environmental impacts from occurring. The environmental impacts that may result following a release to the air environment and which should be noted by onsite personnel are listed below:

- Reduction in the aesthetics of the air environment at the location of a sensitive receptor;
- Potential health impacts to onsite personnel or at the location of a sensitive receptor;
- Environmental harm or nuisance at the location of a sensitive receptor; and
- Reduction in the health and biodiversity of ecosystems.

The conditions and actions listed below have been identified as some of the precursors to the impacts outlined above. Facility Employees must work collectively to ensure that these conditions do not occur.

- Failure to conduct activities in the appropriate manner, location or at the appropriate time (i.e. as specified in the procedures). For example, turning occurs in the early hours of a winter's day when there is a temperature inversion in place;
- Dust and particulate liberation from site traffic movements;
- Dust and particulate liberation from unloading and loading operations;
- Dust and particulate liberation from the sorting and screening of finished compost products;
- The spreading of host plant material;
- Offensive odour liberation from the onsite stormwater and leachate detention basins , if the top half is not maintained in an aerobic state;

- Offensive odour release due to the irrigation of odourous leachate;
- Offensive liberation from the sorting and screening of immature compost products;
- Release of offensive odour from the improper construction and maintenance of the composting windrows through the 1st phase of composting;
- Release of particulates, ash, smoke and vapours resulting from spontaneous combustion of the composting windrows; and
- Windblown litter.

The above issues are addressed in *Section 11.1 Air Management* below and in the relevant workplace procedures (refer to **Appendix 1, Workplace Procedure 10 – Dust and Particulate Management** and **Workplace procedure 11- Odour Management**).

10.2 Water Impacts

It is to be noted that the types of waste accepted at the GRCF, if not adequately managed have the potential for causing detrimental impacts on the receiving water environment. For example, releases of certain oxygen-demanding contaminants to water can cause fish kills due to oxygen depletion, and if prolonged, could threaten the sustainability of fish and invertebrate life in the downstream aquatic system.

The environmental impacts that may result following a release of poor-quality water to the receiving water environment (surface waters and groundwater) are as follows, particularly if the releases are prolonged:

- A decrease in the water quality that results in:
    - A reduction in the aesthetic value of the receiving waters;
    - Potential health impacts to livestock or persons utilising the waters downstream, either directly or indirectly; and
    - Reduction in the health (species richness) and biodiversity of the receiving ecosystems.

Whilst it is highly unlikely that the above bulleted scenarios will occur due to the way the activity is to be performed at the GRCF, it remains of paramount importance for Facility Employees to adhere to the procedures contained within this CMP. The procedures provide a framework for BPEM which when implemented minimises the likelihood of any adverse impacts to the receiving water environment. Further to this, Facility Employees are directed to the Surface and Groundwater Management Plan (SGWMP), written specifically for the management of stormwater and leachate at the GRCF which expands on the information provided within this CMP.

The mechanisms and actions outlined below have been identified as potential precursors to the environmental water impacts and all onsite personnel must work collectively to ensure that they do not occur.

- Failure to conduct activities in the appropriate manner, location or at the appropriate time (i.e. as specified in the procedures); and
- Release of contaminants to surface water or groundwater as a result of:
    - a spill being ineffectively managed (refer to **Appendix 1, Emergency Procedure 2 – Spill Management**);
    - an overtopping of the onsite leachate detention basin due to the volume of leachate requiring containment being in excess of the available containment capacity of the leachate detention basin but which is less than the volume required to be detained (i.e. the volume generated in a 1 in 25 year 24 hour rainfall event); or
    - the poor maintenance of the bed or banks of stormwater drains and/or the onsite stormwater, sediment and leachate detention basins.

The above issues are addressed in *Section 11.2 Water Management* and in the relevant procedures (refer to **Appendix 1, Workplace Procedure 12 – Stormwater and Leachate Management and Workplace procedure 13 – Dam Management**).

Further to the above, the SGWMP contains further specific Workplace Procedures, as listed below:

- Workplace Procedure 1 – Leachate Management;
- Workplace Procedure 2 – Leachate Detention Basin Management;
- Workplace Procedure 3 –Leachate Detention Basin Monitoring; and
- Workplace Procedure 4 – Erosion and Sediment Control Procedure.

10.3 Noise Impacts

Facility Employees must recognise that if operations are not properly managed that noise emissions from the GRCF may occur at a level which is invasive and as such is the cause for environmental nuisance. The environmental impacts that may result following a noise release are:

- Intrusive noise is experienced at a sensitive receptor at a level which causes environmental harm or nuisance; and
- A decrease in the aesthetic enjoyment of the environment surrounding the Facility or at a location of a sensitive receptor.

It is essential for Facility Employees to adhere to the procedures in this CMP, as they provide a framework for BPEM which when implemented minimise the likelihood of any adverse environmental

impacts to the receiving environment. The mechanisms or actions by which the above impacts may occur are highlighted below and all Facility Employees must work as a team to ensure that they do not occur.

- Failure to conduct activities in the appropriate manner, location or at the appropriate time (i.e. as specified in procedures);
- Use of faulty or malfunctioning plant and/or equipment (e.g. excavator with loose bucket);
- Impact or impulsive noise occurring during night time hours;
- Tonal noise (e.g. constant whining or screeching) from the operation of plant or equipment that is not addressed; and
- Vehicles and/or plant equipment are allowed on to site without being appropriately silenced.

These issues are addressed in *Section 11.3 Noise Management* below and in the relevant workplace procedure (refer to **Appendix 1, Workplace Procedure 15 – Noise Management**).

10.4 Land Impacts

Facility Employees must recognise that if activities are not appropriately managed at the GRCF they have the potential to cause detrimental impacts to the receiving land environment, such as a:

- Reduction in the aesthetics onsite and of surrounding land;
- Reduction in soil quality and health due to the spreading of contamination; and
- Loss of soil in areas vulnerable to erosion through the intensification of stormwater being released to the receiving environment with the commensurate release of sediment ladened waters.

The following situations have been identified as precursors to the above listed impacts and therefore Facility Employees must work cooperatively to ensure that they do not occur so as to avoid or minimise impacts to the receiving environment.

- Failure to conduct activities in the appropriate manner, location or at the appropriate time (i.e. as specified in procedures);
- Spills are not immediately contained and cleaned up in accordance with **Emergency Procedure 2 – Spill Management** and contaminated soil has not been removed and disposed of (refer to **Appendix 2 –Emergency Procedures**);
- Lack of control methods for the management of weeds;
- Inappropriate use of herbicides to control weeds;
- Deliberately releasing contaminated liquids or wastes directly to land;

- Irrigation of leachate that displays poor physicochemical properties (i.e. pH, total dissolved salts, BOD/COD);
- Unnecessary disturbance of or removal of vegetation from the surrounding land; and
- Failure to control stormwater in a manner that does not impact on the receiving land and water environment.

The above issues are addressed in *Section 11.4 Land Management* below.

10.5 Waste Impacts

Facility Employees must understand that if waste is not appropriately managed at the GRCF it has potential to negatively impact the receiving environment. The potential impacts to the air, water and land environments that have been identified as a result of improper management of waste are outlined below:

- Reduced aesthetic appeal from litter beyond the boundary of the Facility;
- Hazardous or unpleasant working conditions at the Facility;
- Attraction and proliferation of pests and/or vectors;
- Loss of species richness and/or biodiversity of receiving waters, due to an increase in contaminants released to such waters; and
- Reduced quality of the air environment within or beyond the boundary of the Facility.

The conditions and actions listed below have been identified as potential precursors to the above impacts, and all Facility Employees must work together to ensure that these do not occur.

- Failure to conduct activities in the appropriate manner, location or at the appropriate time (i.e. as specified in procedures);
- Spills of waste are not immediately contained and cleaned up in accordance with **Emergency Procedure 2 – Spill Management** (refer to **Appendix 2, Emergency Procedures**);
- General waste is not managed appropriately, i.e. is not placed into receptacles/containers which are emptied when full and the waste disposed of; as such,
    - waste is allowed to proliferate beyond the boundary of the Facility.
    - waste is allowed to enter the air, water or land receiving environments.
    - accumulates causing a fire hazard on or offsite.
- Lit cigarettes are not appropriately extinguished prior to disposal causing a fire incident; and
- Waste is placed in the stormwater flow paths resulting in the inappropriate direction of stormwater and possible movement of waste to onsite ponds/dams or to receiving waters

These issues are addressed in *Section 11.5 Waste Management*, which outlines a number of control measures to prevent the occurrence of the above listed conditions.

11 Environmental Management

The subsections below describe the management procedures and control measures that must be implemented at the GRCF in order minimise or prevent environmental harm or nuisance and the environmental impacts outlined in *Section 10 Identification of Environmental Impacts* above.

11.1 Air Management

As air management consist of two aspects, primarily dust and odour generation, the following two sections have been provided.

11.1.1 Dust and Particulate Management

Dust and particulate generation as a result of composting activities must be minimised to the greatest possible extent. This will be achieved by adherence to the control measures and procedures outlined below.

Bio-Recycle is committed to ensuring that generated dust does not pass the site boundary. This performance measure is easily achieved via observation, and as such all employees are encouraged to cease activities that are producing dust to the extent that visible dust is seen to be passing the site boundary.

The hardstand pads and the internal roadways must be regularly wetted to suppress dust using either a water cart or designated sprinkler system. Consideration will be given to placing sprinklers for use in heavily trafficked areas. Records of all water cart or sprinkler system usage for the purposes of dust suppression must be kept (refer to **Appendix 2, Form 17 – Dust Suppression Record**). The seasonal variation in the evaporation rate must be taken into account with regards to the quantity of water applied and frequency of application. Care must be taken to ensure that dust suppression water does not pond or pool on the surfaces they are applied to.

The water used for dust suppression on the composting hardstand pad can be sourced from the leachate detention basin. For areas outside the composting pad such as the haulage roads, dust suppression water must be sourced from the southern void water body. Leachate from the leachate detention basin must not be utilised outside of the composting hardstand pad for dust suppression on haulage roads. Water that is pumped from Void 4 will be utilised for this purpose.

To prevent the liberation of dust and particulate matter during composting several measures must occur. Dust suppression must occur to any loads which are particularly dry or dusty prior to unloading. Whilst

it is unlikely that dust nuisance will be caused from the delivery of an isolated load, wetting down will protect the health and safety of onsite personnel. It is essential that the person manning the site office must enquire at the time of entrance to the Facility as to whether the load is dusty so that appropriate measures can be taken when unloading occurs.

Stockpiled materials must be wetted regularly. This is particularly important in times of high wind conditions. Care must be taken to ensure that the excessive wetting of stockpiles does not occur, such that the production of leachate is avoided.

Windrows, particularly open windrows will be constructed and maintained in accordance with **Workplace Procedure 2 - Open Windrow Construction & Maintenance** (i.e. 45-50% moisture w/w (refer to **Appendix 1 – Workplace Procedures**). Furthermore, this will reduce the propensity for dust and particulate liberation from windrows, as well as minimising the likelihood of spontaneous combustion, which would result in the release of particulates, smoke, ash and potentially noxious vapours to the receiving environment. Waters for this purpose can be sourced from all onsite dams.

Compost must be dried to 35% w/w prior to being subject screening. The screening of composting must not be undertaken when wind conditions are excessive.

The issues above summarised in the relevant workplace procedure which must be adhered to by Facility Employees (refer to **Appendix 1, Workplace Procedure 10 – Dust and Particulate Management**).

11.1.2 Odour Management

Bio-Recycle understands the importance of creating and maintaining aerobic activity so that offensive odour conditions do not arise and has the necessary experience to ensure odorous conditions do not occur. All Facility Employees must understand that certain control measures and procedures are implemented to ensure that an aerobic state is maintained within windrows, stockpiles and contained water, and as such any deviation from these control measures without management approval will not be accepted.

It is essential that when identified, offensive odour is minimised or prevented from proliferating onsite. Contrary to popular belief, offensive odour does not need to be associated with a facility for the manufacture of composting, if all windrows, basins/dams and stormwater drains are maintained in an aerobic state and are not allowed to turn anaerobic. Maintenance of an aerobic environment will prevent odorous gases, such as hydrogen sulphide (rotten egg gas), amines, ammonia and other volatile organic compounds (VOCs) from becoming the predominant odours experienced at the GRCF.

Information is provided in *Section 11.2.2 Basin Water Health and* Management below which outlines how the onsite basins will be maintained in an aerobic state.

Putrefying wastes (i.e. wastes that are in an advance state of decay and is highly odorous) must be actively excluded from the GRCF by effective waste vetting at the point of the site office or deposition on the active hardstand pad. In the event that particularly odorous waste is accepted at the Facility it must be inoculated with proprietary products; such as BioAktiv or Effective Microorganisms (EM) products, as soon as possible to minimise odour proliferation. It may also be necessary to inoculate the waste as it is incorporated into a windrow to ensure stability whilst undergoing the detoxification phase.

Facility Employees must be aware that it is essential for an effective detoxification phase to occur. The detoxification phase not only assists with the destruction of pathogens and weed seeds, it also facilitates in the assimilation of VOCs into the windrow matrix. Therefore, if a windrow is opened prematurely or the starting mixture has not been homogeneously mixed, there is a risk that VOCs will be released and offensive odour experienced.

Set composting recipes are to be adhered to ensure there are no imbalances. The initial turning event after the detoxification phase must be homogenous to ensure that remaining outer material within the compost is subjected to thermophilic composting. This will ensure that appropriate portions of various materials are combined so that putrefying conditions do not develop.

Adherence to the relevant workplace procedures during composting operations will ensure that releases of offensive odour do not occur or if they do, that they are promptly minimised (refer to **Appendix 1**:

- **Workplace Procedure 1 – Waste Receival and Unloading**;
- **Workplace Procedure 2 - Open Windrow Construction & Maintenance;**
- **Workplace Procedure 11 – Odour Management**;
- **Workplace Procedure 12 – Stormwater and Leachate Management**; and
- **Workplace Procedure 1 3 – Dam Management)**.

11.2 Water Management

Water management has been separated into three aspects, namely Stormwater Management, Basin/Dam Health and Management and Groundwater Management and are presented below.

11.2.1 Stormwater Management

Bio-Recycle is aware of the importance of managing stormwater that is contaminated with raw wastes or composting material onsite and is therefore committed to implementing leachate management at the Facility that contains procedures to effectively manage the leachate generated onsite. Key to this is the exclusion of clean stormwater flows from entering the composting hardstand pads. This must be achieved through the installation of low soil bunds (~20-50 mm) around the hardstand pad.

All leachate runoff generated as a result of incidental rainfall over the hardstand pad must be directed to the designated leachate detention basin as illustrated in **Appendix 4 – Figure 4**.

The hardstand pad must be graded so as to achieve the desired velocity of leachate flow, but the gradient of the hardstand pads must not be severe enough to increase the velocity of leachate such that erosion is caused. The installation of the soil bunding around the pads will also facilitate the desired movement of leachate runoff to the designated leachate detention basin.

Bio-Recycle is committed to ensuring that ponding or pooling of leachate does not occur on the surface of the hardstand pads. Therefore, where large obvious and easily accessible ponds/pools are observed on the surface of the hardstand pads this leachate must be contained and absorbed utilising greenwaste (that is not contaminated with Phylloxera), sawdust, finished compost and/or soil such that it can be reincorporated into the compost mixes.

It is to be noted that the sediment and leachate detention basins servicing the hardstand pad will be subjected to desilting when the capacity of the basins are reduced by 30% of their original capacity.

All leachate that is generated within the areas of the initial two hardstand pads (designated as the catchment area) must be directed via concrete spillway to the designated 1 in 100 year 24 hour ARI detention basin (refer to **Appendix 4 – Figure 5**).

A concrete sedimentation fore-bay will be located prior to the release point so as to minimise sediment loss into the detention basin. The sediment detention bay is considered to be key piece of infrastructure to restrict gross solids entering the detention basin and must regularly be desilted. Once full, the detention basin will spill into the secondary basin which at the current spillway height (RL104.85), will contain approximately another 1 ML. The secondary basin will release to the existing lower basin which will be in place primarily to settle any solids released prior to any waters entering Void 4 (refer to SGWMP V7 – 3.8.16 for detail).

Appendix 4 – Figure 4 highlights the two hardstand areas that makes up the entire catchment area for leachate. It is to be noted that Pads 1 and 2 located on the most western side of the catchment area is to be constructed first and Pads 3 and 4 will be constructed as and when required.

The location of the detention basin will assist in the removal of contained water via pump for reapplication to composting windrows so as to ensure optimal moisture conditions exist throughout the composting cycle. The pump located at the detention basin will also be utilised from time to time to transfer and circulate contained leachate so as to aerate the dam in conjunction with the duty aerator that will be operational to maintain desirable dissolved oxygen levels within the detention basin.

It is to be understood that due to the average annual volume of rainfall (~658.4 mm) that is experienced at the site, and the need for a constant supply of water for the composting activity, Bio-Recycle will at

all times be able to contain leachate runoff generated up to and including a 1 in 25 year 24 hour event with additional capacity for an overall maximum containment volume equivalent to a volume generated within a 1 in 100 year 24 hour event (i.e. 14.7 Ml).

A truck wash out and wash down area must be installed on the hardstand pad for the washing out of waste containers and in the case of host material, a wash down area for the cleaning of the outside and undercarriage of vehicles. This will ensure that contaminants, such as host plant material, in wash waters are contained in the leachate dams and are not deposited on haulage roads or public roads located external to the GRCF.

The truck wash out and wash down area, must consist of a two earthen bund walls on either side of the truck wash area so as to direct wash waters to the designated drainage channel that leads to the designated leachate detention basin.

The back wall (nearest the drainage channel) of the truck wash out/down area must be either comprised of a greenwaste bund or a low wall of crushed rock and/or concrete. This will facilitate the filtering of wash waters to remove gross solids and large sediment before it releases to the respective leachate detention basin.

The floor of the truck wash area must either be layered with greenwaste (not contaminated with Phylloxera) or crushed concrete and or brick. The greenwaste will absorb excess wash waters and prevent them ponding and pooling which could cause damage to the hardstand pads' surface. In addition to this, emplaced brick and concrete will provide traction to vehicle tyres when the truck wash area is wet, further minimising harm to the hardstand pads' surface.

Prior to exiting the site, the exterior of all delivery vehicles must be washed down in accordance with **Workplace Procedure 4 – Cross-Contamination Prevention and Cleandown** and inspected to ensure that it is free of soil and plant material (refer to **Appendix 1 – Workplace Procedures**).

It is to be noted that windrows will be positioned parallel to the surface water flow on top of the hardstand pads to ensure that generated leachate does not accentuate the removal of compost at the base of the respective windrow and thus overload the detention basins with organic matter entering via flows. It is important to understand that excess organic matter entering detention basins will create reducing conditions as organic matter breaks down and due to this, reduced gases such as hydrogen sulphide (rotten egg gas) can be liberated. Due to the size and volume the primary leachate detention basin contains, allowing any anaerobic conditions to predominate will result in extra operational costs in its management, a scenario that is not supported by Bio-Recycle. To be absolutely clear in relation to this aspect of management, all windrows must be aligned with the gradient of the surface so as to minimise the re-entrainment of compost with flowing leachate. This action will minimise the amount of solids that enter the detention basin.

It is important to understand that other factors such as pH play a role in the amount of odour that is released such that if the pH is < 6.5 pH units, sulphide release can be accentuated. Therefore, an understanding that the pH of detention leachate should remain above a pH of 6.5 is essential.

All chemicals kept onsite must be stored in the workshop or one of the surrounding sheds in a bunded area. The chemical storage area must have a concrete floor. Care must be taken to ensure that incompatible wastes are stored in separate bunded areas to prevent any adverse reactions in the event of a spill. Incompatibilities can be identified on the Safety Data Sheet (SDS) provided by the chemical manufacturer. A record of where chemicals are to be stored is to be kept as part of the Potential Pollutants Register (section 4 of the PIRMP).

All bunding must be constructed and maintained with a capacity to contain a minimum of 110% of the largest container or vessel which is stored within it.

All bunding must be regularly inspected to ensure that it is maintained in a structurally integral state. Any observations which indicate the bunding is compromised must be reported to the Site Manager for corrective action. The observation must be recorded using **Form 2 – Stormwater Performance Checklist** contained within **Appendix 2 of the SGWMP – Appendix 2**. *Section 12.3 Maintenance Practices and Procedures* below outlines the regular maintenance required for bunding and other stormwater infrastructure installed at the GRCF.

Any spills that occur must be managed in accordance *Section 11.7* below and **Emergency Procedure 2 – Spill Management** of **Appendix 2**. Employees are also directed to the attached PIRMP for further detail regarding responsibilities when managing incidents.

In the rare event that leachate is released off-site, employees are directed to **Emergency Procedure 3 – Emergency Leachate Release** of **Appendix 2** which is a reproduction of *Emergency Procedure 1* contained within the SGWMP.

11.2.2 Basin Water Health and Management

The leachate detention basin's health depends on the load transferred to it. Due to the types of waste accepted at the GRCF and the nature of composting to be undertaken on the hardstand pad, oxygen demanding substances with a high biochemical oxygen demand (BOD) or a high chemical oxygen demand (COD), will be generated and transported in leachate contaminated stormwater to the designated leachate detention basin.

It is to be understood that aerobic microorganisms digest organic matter via the respiration of oxygen. These microorganisms require a large amount of oxygen in order to decompose wastes which have a high BOD and/or COD, such as proteins, fats, oils, organic matter and ammonia in animal manures. If

the consumption of oxygen from the water column is excessive the aquatic environment will become anaerobic (oxygen-deprived) and prone to the liberation of offensive odours.

It is essential that a basin's water column is maintained in an oxidised state to prevent the generation of offensive odour. Whilst it is unavoidable that some leachate containing high BOD and/or COD substances will be transported to the basins via stormwater flows, the proper management of these types of wastes will ensure that the level of contamination in the basins is kept to a minimum.

In the event that the leachate detention basin receives significant loading or is releasing offensive odour, the basin must be treated with a bacterial inoculum or microbial stimulant, such as BioAktiv, to ensure it is maintained in an oxidised and odorous state and that the BOD is reduced. If however, hydrogen sulphide is being released due to low pH, then the water can be treated such that the pH is raised above 6.5 pH units so as to keep the sulphide in solution.

The aerator that is installed to aerate and mix the water column within the leachate detention basin will promote the oxygenation of the affected basin. The aerator must be operated as and when required, but at least must meet an operational time of 2 hours / day.

To enhance microbial degradation of organic matter within the water column, in an odour free manner, consideration is to be given to utilising microbial inoculums or stimulants, and if one or either are to be utilised, they must be mixed to the required dilution and sprayed across the surface of the basin to enhance contact time. Maintaining or having the ability to quickly re-establish aerobic conditions in the basin's water column so that offensive odours are no longer emitted is the desirable outcome. If BioAktiv is utilised it will also minimise the proliferation of algae in the treated basin.

If the load a basin receives is too excessive then a stronger oxidising agent, such as hydrogen peroxide, will be required. Due to the hazardous nature of hydrogen peroxide, the Site Manager must consult a specialist for appropriate application rates and for onsite supervision during the application of the hydrogen peroxide to the affected basin.

The stormwater and leachate containment basins must be regularly monitored to ensure that the quality of the water in the respective basins is tracked and that adjustments can be made to the basin as and when required.

For further detail, readers are directed to the SQWMP.

11.2.2.1 Basin Monitoring

The stormwater and leachate basin immediately downstream of an in-use hardstand pad must be monitored in-situ every three months for the parameters outlined in *Table 5* below or in the event that

offensive odour is released. This will ensure that good quality waters are being applied to windrows or being utilised for dust suppression.

Table 5: In-situ leachate quality monitoring parameters and frequency

Parameter	Frequency
Dissolved Oxygen (DO) (mg/l)	• Every 6 months. • In the event of offensive odour emanating from an onsite dam or has received significant loading.
pH (pH units)	
Conductivity (mS/cm)	
Redox Potential (mV)	

In addition to the in-situ monitoring, the waters from the stormwater and leachate containment basin must be sampled every six months for the parameters listed below. The samples must be sent for laboratory analysis for the parameters listed in *Table 6* below. These analyses will give an indication of the contamination that could result to surface water and or groundwater in the event of a release (highly unlikely). The laboratory must be NATA accredited.

Table 6: Leachate quality monitoring parameters and frequency

Parameter	Frequency
Biochemical Oxygen Demand (BOD) (mg/l)	Every 6 months.
Conductivity (mS/cm)	
Faecal Coliforms (CFN/ 100 ml)	
Nitrogen (total) (mg/l)	
pH (pH units)	
Phosphorus (total) (mg/l)	
Total Suspended Solids (mg/l)	
Cadmium (µg/l)	
Copper (µg/l)	
Lead (µg/l)	
Nickel (µg/l)	
Selenium (µg/l)	
Zinc (µg/l)	
Suspended Solids (mg/l)	

All leachate quality monitoring must be undertaken in accordance with the associated workplace procedure (refer to **Appendix 1, Workplace Procedure 13 – Basin Management**). The basin monitoring results must be published on the company website within 14 days of being received from the laboratory.

For further detail, readers are directed to the SQWMP.

11.2.3 Groundwater Management

It is to be noted that groundwater could be affected due to uncontrolled releases of contaminants through the bed and banks of the onsite basins or through ill-maintained hardstand pads, bunding and stormwater drains. Facility Employees must regularly observe onsite basins to ensure that the water level does not drop beyond that anticipated from the use of waters for dust suppression, composting and evaporation.

If significant quantities of water are being lost above this anticipated water usage rate, the structural integrity of the basin may be compromised.

All drains and surface gradients designed for the transport of leachate and stormwater to the onsite basins must be maintained in a state that is free of excess vegetation and debris, such that the flow of stormwater or leachate are not obstructed or impeded. The drains and surface gradients must be regularly inspected by Facility Employees to ensure that they are structurally integral.

If an employee makes an observation that the structural integrity of a bund, drain, basin or hardstand pad has been compromised during regular inspections, the Site Manager must be notified so as to enact prompt action. The Site Manager must then ensure necessary actions are taken to rectify the issue and reinstate the integrity of the affected bund/drain/basin/hardstand pad. Observations from inspections of the onsite stormwater infrastructure must be recorded using **Form 21 – Stormwater Infrastructure Performance Checklist** (refer to **Appendix 3 – Forms and Checklists**).

Note Form 21 directs readers to Form 2 contained with the SGWMP V7 – 3.8.16. This is simply to negate double up recording.

Section 12.4 Maintenance Practices and Procedures below provides information regarding the maintenance of bunding, stormwater drains, hardstand pads and the bed and banks of onsite basins. The above mentioned section also illustrates the importance of early observation and the need for efficient operation of equipment and machinery to minimise damage to the hardstand pads. It should be noted that clay must be stored onsite for minor repair work required to be undertaken to stormwater drains, hardstand pads and/or onsite basins.

Note:

Further to the information provided above, a detailed Surface and Groundwater Management Plan has been prepared for the facility.

For further detailed information regarding Stormwater and Leachate management, readers are directed to Workplace Procedure 1- Stormwater Management, contained within the Surface and Groundwater Management Plan prepared for the Greenspot Ravensworth Composting facility, dated 3.8.16, Version 7.

For further detailed information regarding stormwater and leachate detention basin management, readers are directed to Workplace Procedure 2 – Leachate Detention Basin Management & Workplace Procedure 3 – Leachate Detention Basin Monitoring, contained within the Surface and Groundwater Management Plan prepared for the Greenspot Ravensworth Composting facility, dated 3.8.16, Version 7.

11.3 Noise Management

Noise generation at the GRCF must be minimised to the greatest possible extent. The use of machinery and equipment associated with composting operations must be managed in a manner that prevents noise emissions being created greater than background + 5 dB(A) at noise sensitive receptors during normal operating hours.

All plant and equipment utilised at the GRCF must be serviced and maintained in accordance with the manufacturer's specifications. In addition to this, daily start-up checks must occur to demonstrate that plant and equipment are not generating excessive, tonal or impulsive noises (refer to **Appendix 3, Form 7 – Daily Equipment / Machinery Start-Up Checklist**). The Site Manager must be informed of any noises observed that are not normally present so as to enact prompt attention. Plant and equipment deemed to be defective must not be used until the problem is rectified unless there is an absolute need, such as in an emergency and safety can be assured.

Excessively noisy plant or equipment must not be used unless it has to be used to respond to an emergency, such as the movement of waste from a stormwater flow path or to extinguish a fire. Truck transporting materials to and from the Facility are required to be appropriately silenced. Drivers of truck with defective mufflers must be warned that they will not be allowed to return to the site until any defects are rectified. Similarly, transport drivers will be advised not to utilise air breaking in the early hours of the morning which should not occur as the required speed limit along the haulage roads will not be greater than 25 km/hr.

Bio-Recycle is aware that in the event of a valid noise complaint, the EPA may request Bio-Recycle to perform noise monitoring. The Site Manager must engage a suitably qualified and experienced person to carry out the required monitoring as specified by the administering authority and within the timeframe stated.

The above noise control measures are summarised in **Workplace Procedure 15 – Noise Management** (refer to **Appendix 1 – Workplace Procedures**). The implementation of this procedure is considered imperative to ensure that any noise impacts which are a result of the operations at the GRCF are minimised or avoided.

11.4 Land Management

The soils in the receiving environment are largely protected by the siting of the composting activity within the former backfilled void area, including the positioning of diversion bunds and drains. This will ensure that any contaminated stormwaters are effectively contained within the backfilled void area.

The degradation of the quality and health of the soil onsite will be prevented by the capture and containment of the stormwater runoff generated on the composting pads. This will be achieved through

the bunding and grading of the pads to divert stormwaters into the associated stormwater and leachate containment basins (two / hatstand segment refer to **Appendix 4 – Figure 4**). For further information on the stormwater control measures that must be implemented onsite readers are directed to *Section 11.2.1 Stormwater Management* above.

In order to prevent a reduction in aesthetics onsite the site must be maintained in a clean and tidy manner in accordance with *Section 11.5 Waste Management* below. Wastes received onsite must be managed and composted as outlined in the relevant workplace procedures (refer to **Appendix 1, Workplace Procedure 1 – Waste Receival and Unloading**, **Workplace Procedure 2 - Open Windrow Construction & Maintenance** and **Workplace Procedure 9 – Trial Composting**).

11.5 Waste Management

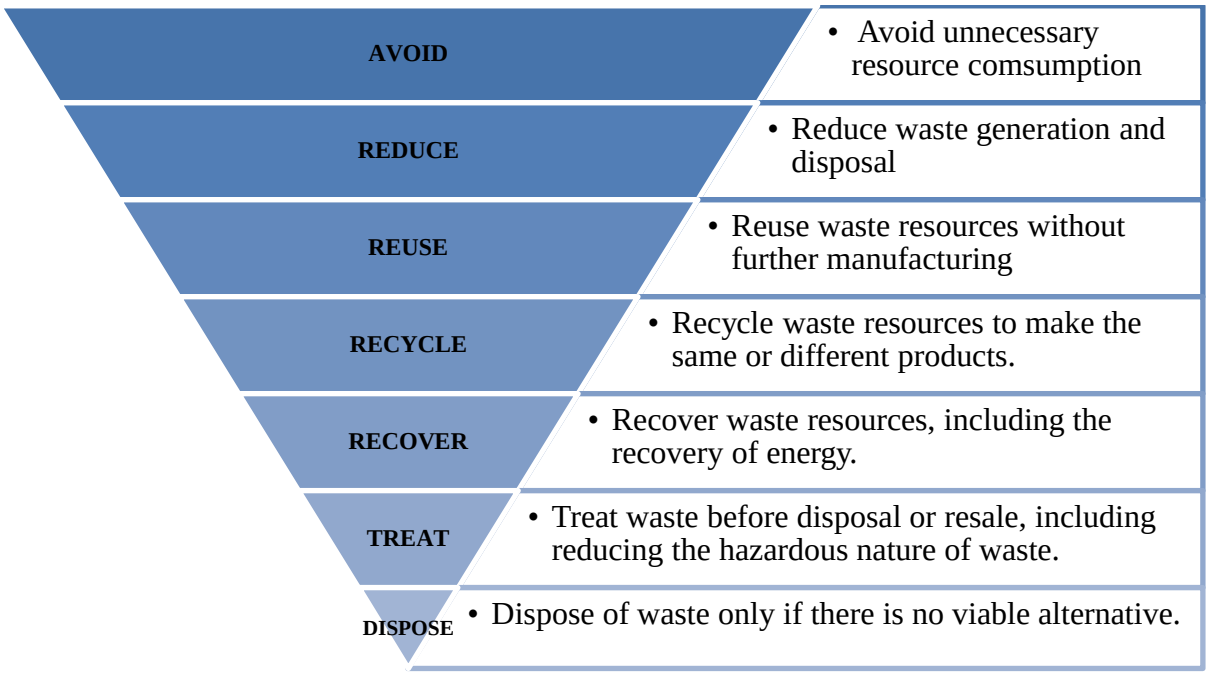
Whilst the GRCF will generate some wastes on a daily basis, Bio-Recycle is committed to prioritising the management of waste generated at the Facility in accordance with the waste and resource management hierarchy, which is outlined in the figure below.

Waste avoidance, reduction, reuse, recycling, recovery or treatment, as opposed to direct disposal, represent management practises higher in the preferred order of adoption in the waste and resource management hierarchy (refer to *Figure 3*).

General wastes must be disposed of in the general waste bins, which must be regularly emptied and the waste disposed of using either a regular council or private waste collection service. Furthermore, compostable wastes may be segregated from the general waste stream for inclusions in onsite composting.

Where possible recyclable wastes must be separated and deposited in designated recycling bins. Recyclable wastes must be collected from the site for recycling by either a council or private waste collection service. Alternatively, the Site Manager may arrange for the wastes to be transferred to an appropriate recycling facility once there is an economically viable quantity for transport.

Figure 4: Waste and resource management hierarchy



The GRCF must be maintained in a tidy manner and be free of wind-blown litter. The Site Manager must organise a general clean-up of the site as and when required.

11.5.1 Prohibited Waste Management

Prohibited waste is defined as waste that is not listed in the waste acceptance criteria of the EPL for the GRCF (refer to *Section 6.1*). The exclusion of prohibited waste must be achieved by the efficient vetting performed at the site office and during the deposition of waste loads on the hardstand pad. Any loads or part loads of prohibited waste discovered must be recorded using **Form 4 – Contaminant Characteristics Report** (refer to **Appendix 3 – Forms and Checklists**).

Any prohibited waste which is discovered should be immediately reloaded in the respective transport vehicle and transported to a facility that can lawfully accept it. Alternatively, if the vehicle has already left the Facility the site, the Site Manager must determine the waste transport company who delivered the waste. The Site Manager must as soon as practicable contact the said company as soon as possible with the expectation that the company will collect the prohibited waste and transport it to a facility that can lawfully accept such waste.

It should be noted that consignments of prohibited waste which is contaminated or potentially contaminated with host plant material, sourced from the PIZ must be accompanied by a completed PHAC and transported in accordance with Part A of *CA-05*.

The EPA must be notified of all instances involving the unintentional acceptance of prohibited waste. In addition to this, the DPI must also be notified if the prohibited waste is contaminated with host plant material.

11.6 Spontaneous Combustion Prevention and Management

An open type windrow generates heat from the multiplication of micro-life present within the mixture. This heat which provides for pasteurising temperatures if not managed correctly (i.e. kept from increasing excessively) can be a precursor for compost to spontaneously combust. This will occur if windrows are allowed to become anaerobic, and are allowed to generate and maintain excessive heat (> 67°C). It must be understood that 67°C has been chosen as the trigger value as it is widely accepted that beneficial micro-life become affected at temperatures commencing at 62°C and particularly at temperatures greater than 67°C.

According to the composting and recycling journal "*Biocycle*", in an article titled "*Fires at Composting Facilities Causes and Conditions*" spontaneous combustion is a chain reaction of several different heat generating processes (Rynk, 2000). Whilst the heat source required to initiate a fire is not directly attributable to the heat generated from microbial activity, it is excessive heat generated from microbial activity that generates enough heat for certain chemical reactions to start. It is these chemical reactions that release heat which can eventually start conditions of smouldering.

Whilst the temperature required for the auto-ignition of methane (a by-product of anaerobic digestion) is high (approximately 580°C), other molecules or by-products of heat generating reactions cause the windrow to heat. The chemical processes include chemical oxidation, slow pyrolysis and absorption or condensation of gases within dry charred particles (e.g. ashing) (Rynk, 2000).

This complex mixture of trapped gases (anaerobic by-products) and heat generated from the associated chemical reactions contained within a large windrow mix sustains smouldering. An introduction of oxygen at this time (e.g. opening up a windrow) will ignite a flame and spontaneous combustion will proceed.

Therefore, it is essential that Facility Employees comply with the associated workplace procedures, to ensure that open windrows are constructed and maintained to prevent anaerobic conditions predominating and windrows being allowed to reach temperatures in excess of 67°C (refer to **Appendix 1, Workplace Procedure 2 –Open Windrow Construction & Maintenance, Workplace procedure 5 – Temperature Monitoring and Workplace Procedure 7 – Spontaneous Combustion Prevention)**.

In the event that spontaneous combustion does occur, Facility Employees must implement Emergency Procedure 1 – Fire management (refer to **Appendix 2**).

11.7 Spill Management

The prevention measures for a spill are outlined in **Emergency Procedure 2 – Spill Management** (refer to **Appendix 2 – Emergency Procedures**) and information contained within the attached PIRMP. Adherence to the control measures stated in the above sections and associated PIRMP will minimise the likelihood of a spill at the GRCF.

Any spills of oil, fuel or specific wastes/chemicals that occur at the GRCF must not be intentionally directed to onsite stormwater flow paths unless there is a necessity to do so, as in an emergency for example. Spills must instead be contained, cleaned up and removed by dry methods. It should be noted that this type of spillage is rare and could only occur from an incident during for example, refuelling of vehicles or if a gearbox or hydraulic unit is ruptured.

Any spills to soil must be managed accordingly, with contaminated soil either being composted or bio-remediated at the Facility. Alternatively, if the contaminated soil is unsuitable for composting or bioremediation it must be sent to a landfill facility for disposal if total contaminant concentrations or toxicity characteristic leaching procedure (TCLP) values are appropriate.

12 Management Procedures

The following sections provide detail surrounding routine procedures, including the training of staff, performing maintenance of equipment, machinery, infrastructure and performing daily weather observations.

12.1 Routine Procedures

Bio-Recycle is committed to providing routine operating procedures to prevent or minimise environmental harm or nuisance, however occasioned or caused during normal operations.

Daily routine operations must therefore be carried out with the safe systems of work provided within the above mentioned procedures so that the GRCF can be operated effectively with no or little impact to the receiving environment. The workplace procedures contained within **Appendix 1** and the emergency procedures contained in **Appendix 2** are listed in the table below:

Table 7: Workplace and emergency procedures

Workplace Procedure Title	Procedure Number
Receival of Wastes	1
Open Windrow Construction & Maintenance	2
Finished Compost Stockpile Management	3
Cross-Contamination Prevention and Cleandown	4
Temperature Monitoring	5

Workplace Procedure Title	Procedure Number
Carbon Dioxide Monitoring	6
Spontaneous Combustion Prevention	7
Quality Limits Sampling	8
Trial Composting	9
Dust and Particulate Management	10
Odour Management	11
Stormwater and Leachate Management	12
Basin Management	13
Rain-Induced Anaerobic Windrows	14
Noise Management	15
Waste Management	16
Weed Management	17
Emergency Procedure Title	**Procedure Number**
Fire Management	1
Spill Management	2
Emergency Leachate Release	3

Appropriate first aid equipment must be readily accessible in various locations throughout the Facility and an adequate number of personnel must be trained in workplace first aid.

12.2 Pollution Management

A pollution incident is defined in the Dictionary of the *POEO Act* as "*an incident or set of circumstances during or as a consequence of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed of on premises, but it does not include an incident or set of circumstances involving only the emission of any noise*."

12.2.1 Availability of PIRMP

In accordance with Section 98D of the *POEO (General) Regulation* Bio-Recycle must ensure that a copy of the PIRMP is readily available:

- to the EPA or local council on request; and
- at the Facility for any individual who is responsible for the implementation of the PIRMP.

Further to the above, the PIRMP must also be made available to the public within fourteen (14) days after it has been prepared either by:

- display in a prominent position on the company website; or

- if the company does not have a website – by providing a copy of the plan, without, charge to any person who makes a written request for a copy.

A copy of the PIRMP, including the workplace and emergency procedures, must be made available to staff during training. Furthermore, any changes or updates made to these procedures must be identified to staff during toolbox meetings. If necessary, additional training must be provided to ensure that the changes made to procedures are correctly implemented.

All workplace and emergency procedures will be laminated and positioned in various locations throughout the Facility for easy access by onsite personnel, including inside onsite vehicles. Care must be taken to ensure that all copies of these procedures are updated as and when required.

12.3 Staff Training

Bio-Recycle believes that no employee should be allocated a task to perform without adequate training. The safety of employees is paramount and essential for the successful operation and as such Bio-Recycle commits to ensuring that all employees receive sufficient training in their respective tasks to undertake them competently and safely. In some instances, third party consultants may be engaged to provide training.

During training emphasis must be placed on making Facility Employees aware of the potential environmental impacts to the local environment that his or her work duties may create.

All training related to conducting composting activities is to be recorded so that Bio-Recycle can demonstrate that each individual worker has received the correct and appropriate training for the tasks they are performing (refer to **Appendix 3, Form 23 – Training and Competency Register**). Bio-Recycle must also demonstrate that each employee engaged in a specific working environment (e.g. liquid or solid waste receival) is able to conduct their normal work duties safely and with minimal risk to their co-workers, any other person onsite and to their immediate and local environment.

Bio-Recycle is committed to delivering training to all staff members and specialised training to those employees who could be called upon to respond to an emergency, be it a fire or a spill incident. Staff must attend training sessions when requested to do so. A record of any training Facility Employees receive must be kept in their personnel record.

Practise drills must be used as part of the emergency response training to familiarise personnel with the emergency procedures and to ensure that they are competent in the enacting of the procedures. These practise drills can be undertaken in coordination with the local emergency services, as and when required. All Facility Employees must be trained in the use of all emergency procedures and equipment, and it will be recorded that such training has been given and competencies reached.

As a general rule, the following items must be adhered to:

- **Operating manuals, SOPs or instructions** which will be given to the Facility Employees by the Site Manager prior to any equipment or machinery being operated;
- The Facility Employees must **demonstrate a sound understanding and/or working knowledge** before the use of any equipment or machinery is to occur. This must be recorded; and
- **Appropriate approvals, registration or certification** must be attained before operation of any machinery or equipment that is required to have such an approval.

Whilst it is the responsibility of the Site Manager to ensure the above is carried out, every employee is required to observe activities onsite and not allow fellow colleagues to operate in an environment where they have a lack of knowledge about the processes or issues associated with any aspect of operations.

Moreover, unsafe work practises are not supported under any circumstances and any employee witnessing an unsafe act has the responsibility to report this to a Manager immediately so that appropriate action can be taken as required, to prevent the unsafe condition persisting or being repeated.

12.3.1 Toolbox Meetings

Regular onsite 'toolbox' meetings are a forum where workplace and emergency procedures can be discussed. At these meeting, discussions must be held regarding how effectively the team is achieving minimisation of any adverse impacts associated with the activities conducted onsite and how will they have responded in the past to a release.

12.4 Maintenance Practices and Procedures

Composting cannot be conducted effectively if machinery or equipment has not been maintained in good working order. Therefore, Bio-Recycle is committed to providing machinery and equipment that is fit-for-purpose and safe. There must be no compromise on quality of operations at the Facility due to machinery and equipment not operating properly.

All machinery and equipment must be operated in accordance with the manufacturer's specifications, and schedules services must be adhered to. The Site Manager is responsible for ensuring that servicing and maintenance is conducted when required.

12.4.1 Daily Equipment/Machinery Start-up Checklist

The use of the Daily Equipment/Machinery Start-up Checklist will assist Bio-Recycle in continually maintaining and improving machinery and equipment, through regular observation and inspection and the systematic recording of faults. It will also provide protection for Facility Employees from

machinery or equipment that may be operating with minor faults, which could lead to greater operational risk.

12.4.2 Infrastructure

Apart from the maintenance of machinery and equipment attention must also be given to the infrastructure present onsite, such as:

- Drainage channels;
- Hardstand pads;
- Bunding (temporary or permanent); and
- Onsite stormwater and leachate containment basins.

It is essential that once installed, the above infrastructure is regularly inspected to ensure their structural and functional integrity in order to divert clean waters, contain any contaminated stormwater and prevent the release of contaminated water to the receiving environment is achieved.

Form 5 – Daily Running Sheet is provided for the recording of any observations made regarding extraordinary events or emergencies (refer to **Appendix 3 – Forms and Checklists**). All Facility Employees are required to report any observations made to the Site Manager for attention and any necessary corrective action or repairs.

12.4.2.1 Drainage Channels

Drainage channels are important for the drainage and direction of stormwater and leachate across the Facility. Drains and flow paths must be visibly inspected regularly (particularly after rainfall events) for evidence of cracking, blocking or a build-up of sediment or excessive growth of vegetation resulting in the inefficient drainage of waters and the ponding or pooling of waters in the drains. The drainage channels or surface gradients must be maintained such that stormwater is directed as desired.

Form 21 – Stormwater Infrastructure Performance Checklist has been provided for the recording of observation about the performance and integrity of the stormwater control system (refer to **Appendix 3 – Forms and Checklists**). Any cracks or leaks found along the drainage channels or undesirable surface gradients must be repaired or rectified promptly.

12.4.2.2 Bunding

The purpose of bunding is either to contain contaminated stormwater generated as a result of conducting activities or chemical storage spillage, or to exclude clean stormwater from the Facility. Therefore, it is crucial that the integrity of all bunding is maintained to minimise the generation of contaminated stormwater. The bunding must be visually inspected for cracks or gaps with deficiencies reported to

the Site Manager via **Form 21 – Stormwater Infrastructure Performance Checklist** (refer to **Appendix 3 – Forms and Checklists**).

12.4.2.3 Basins

It is to be noted that a stormwater and leachate containment basin could become a point source of pollution to groundwater. Due regard must be given to the daily water level so that the loss of water over and above the mount that is taken for onsite use is not greater than the evaporation rate. This observation can help with the early detection of leakages.

Any cracks observed in the base and side walls of the dam must be repaired using clay, preferably bentonite or a bentonite clay mixture. Any observations of cracks or leaks from the onsite dams must be recorded using **Form 21 – Stormwater Infrastructure Performance Checklist** and reported to the Site Manager (refer to **Appendix 3 – Forms and Checklists**).

12.4.2.4 Hardstand Pads

Well designed and properly functioning hardstand pads are essential for the efficient operation of the GRCF. If the structural integrity of the hardstand pads is not maintained then they can become a point source of groundwater pollution by the infiltration of contaminants through the ground.

It is essential to maintain a gradient that effectively facilitates the movement of stormwater over the surface of the hardstand pad to the respective containment dam. Problems such as anaerobic activity, vermin attraction, mosquito and fly breeding can become problematic if ponding and pooling of water persists due to undulations present on the surface of the hardstand pads.

Proper operation of a front end loader (FEL) is essential to minimise the likelihood of compromising the integrity of the hardstand pads. If the integrity of the hardstand pads is continually compromised it must be repaired. It is more desirable to leave minor amounts of materials on the hardstand pad surface to be removed by hand or an onsite bobcat for example, than to attempt removal with the FEL and risk compromising the integrity of the hardstand pads. The Site Manager is responsible for ensuring that the FEL operator is proficient in the operation of such equipment. Operators will become familiar with respective SOPs for the operation of certain pieces of plant and equipment.

Whilst general housekeeping such as mopping up leachate, suppressing dust, cleaning and repairing drains, minor cracks and depressions in the hardstand pads is routine, having to continually repair a damaged hardstand pad becomes time consuming and may even compromise the Facility's environmental performance.

12.4.3 Daily Weather Conditions

Daily weather conditions must be recorded using **Form 6 – Daily Weather Conditions** (refer to **Appendix 3 – Forms and Checklists**). This is an extremely useful data set that can be used for example to predict when runoff will occur under certain rainfall conditions and to schedule repair and maintenance of trafficable areas after certain rainfall volumes are experienced.

The workplace procedures encompass information that helps Facility Employees complete their work so that unplanned maintenance is minimised. All employees are encouraged to discuss potential changes to any facets of the operation with the Site Manager in order to gain efficiency (refer to *Section 15 Continuous Improvement and Periodic Review of Environmental Performance*). If more efficient practices can be obtained, routine maintenance for certain aspects of the activity may be lessened.

13 Complaints

Any complaints received either written or verbal must be recorded using **Form 25 – Complaint Register** (refer to **Appendix 3 – Forms and Checklists**). The compliant must be investigated and corrective action taken to resolve the source of the complaint.

14 Record Keeping

All records kept in the course of the operation of the Facility must be retained either as a hard copy or electronically for a minimum of five years. These records include:

- Induction and training records;
- The forms in **Appendix 3** completed as part of day-to-day operations;
- Monitoring result and any third party reports;
- Environmental incidents, non-compliance incidents and corrective action reports controlled under the PIRMP; and
- Complaints and corrective action reports.

The above records must be made available to the administering authority either the EPA with regard to the EPL or the DPI with regard to *CA-05* or the Bathurst Regional Council upon request.

15 Continuous Improvement and Periodic Review of Environmental Performance

Bio-Recycle must hold an annual meeting intended for the periodic review of the workplace and emergency procedures to ensure that BPEM is being undertaken at the GRCF. The aim of this annual review meeting is not only to review these procedures but also to review all information collected and recorded throughout the year, as well as, any past, present of foreseeable problems associated with the way the Facility is operated. The focus of this meeting is on improving the level of environmental protection provided and to maintain a robust and adaptive approach to BPEM.

The aforementioned meeting is aimed at the continual improvement of the level of environmental protection offered by appropriately managing the Facility. Improvements can be made at any time when identified by any employee by submitting Form 24 – Continuous Improvement to a Manager where they believe a current workplace or emergency procedure can be improved (refer to **Appendix 3 – Forms and Checklists**).

16 References

Department of Primary Industries, 2012. *Work Instruction 01 Guidelines for completion of Plant Health Assurance Certificates,* Orange, NSW: Department of Primary Industries.

Department of Primary Industries, 2013. *CA-05 Biosecure transport and treatment of host plant material destined for recycling or waste,* Orange, NSW: Department of Primary Industries.

Handreck, K., 1978. Composting: Making soil improver from rubbish. In: *Discovering Soils No. 3.* Melbourne: CSIRO Publishing.

Higa, T., 1991. *Effective microorganisms: A biotechnology for mankind.* Washington, D.C., U.S. Department of Agriculture, pp. 8-14.

Higa, T. & Wididana, G., 1991. *The concept and theories of effective microorganisms.* Washington, D.C., U.S. Department of Agriculture, pp. 118-124.

Ingham, E., 2004. *The Foodweb in Compost.* Lismore, NSW: Southern Cross University.

National Vine Health Steering Commitee, 2009. *National Phylloxera Management Protocol (Version 2009.4).* [Online] Available at: http://www.phylloxera.com.au/media/National-Phylloxera-Management-Protocol.pdf [Accessed 4 Nov 2014].

Phylloxera and Grape Industry Board of South Australia, 2005. *A guide to Grape Phylloxera in Australia,* Stepney, South Australia: Phylloxera and Grape Industry Board of South Australia.

Phylloxera and Grape Industry Board of South Australia, 2012. *What is Phylloxera?.* [Online] Available at: http://www.phylloxera.com.au/bio-security/phylloxera/ [Accessed 23 Oct 2014].

Rynk, R., 2000. Fires at Composting Facilities Causes and Conditions. *BioCycle Journal of Composting & Organics Recycling,* January.41(1).

Standards Australia Committee CS-037 (Garden Soils and Potting Mixes), 2012. *Australian Standard Composts, soil conditioners and mulches AS 4454-2012,* Sydney: Council of Standards Australia.

Appendix 1

Workplace Procedures

1 Introduction

This appendix (**Appendix 1**) details workplace procedures for various day-to-day activities that will be conducted at the GRCF. Stated measures contained within the respective procedures detail information for site personnel to use as a guide when conducting various activities that have the potential to cause environmental harm or nuisance.

Emergency procedures are contained in **Appendix 2**. These procedures have been prepared for the purpose of responding to emergency incidents, such as fire or a spill incident, in an environmentally responsible manner.

Appendix 3 contains the forms and checklists which must be used in conjunction with these workplace and emergency procedures. The forms outline the pertinent information that must be recorded during both day-to-day and emergency incidents, such that reporting to the administering authority (the EPA or the DPI) can occur when requested.

The workplace and emergency procedures are intended as a guide for Facility Employees when carrying out specific tasks whilst having due regard for the receiving environment. For the purpose of accessibility to site personnel, workplace and emergency procedures must be laminated and positioned in various locations throughout the Facility, including inside vehicles.

Workplace Procedures

Tables

2 Workplace Procedures

<table>
<tr><th colspan="2">Workplace Procedure 1 – Waste Receival and Unloading</th></tr>
<tr><td colspan="2">Environmental Commitment:

• The receival of wastes at the GRCF must not cause environmental harm, including air, water or land pollution.
• To ensure that the receival of host plant material at the GRCF occurs in accordance with CA-05 Biosecure transport and treatment of host plant material destined for recycling or waste (CA-05).

Note: ‘Host plant material’ refers to organic waste, such as food and garden waste, that is contaminated with or is potentially contaminated with Phylloxera due to its prevalence within the Sydney Phylloxera Infested Zone (PIZ).</td></tr>
<tr><td>Identification of Issues:</td><td>Potential Impacts:</td></tr>
<tr><td>• Uncontrollable release of liquid waste from tanker/transport vehicle to the hardstand pad.</td><td>• Spillage of the waste occurs which contaminates air, water and/or land environments.
• Nuisance complaints regarding offensive or noxious odours at odour sensitive places.
• The structural integrity of the hardstand pad is compromised.
• Enforcement action taken by the EPA.</td></tr>
<tr><td>• Allowing waste of unknown origin to be accepted.
• Prohibited waste has been unknowingly accepted at the GRCF.</td><td>• Spillage of the waste occurs which contaminates air, water and/or land environments.
• Nuisance complaints regarding offensive or noxious odours at odour sensitive places.
• Environmental nuisance or harm is caused.
• Workplace health and safety of site personnel may be compromised by the acceptance of unknown or prohibited waste.
• Enforcement action taken by the EPA.
• Financial loss due to requirement to clean up and remediate.</td></tr>
<tr><td>• A Plant Health Assurance Certificate (PHAC) is not presented for host plant material by the Transport Driver upon arrival at the GRCF.</td><td>• Contravention of CA-05.
• Enforcement action taken by the DPI.</td></tr>
<tr><td>• A sample of liquid waste to be held for 30 days is not obtained.</td><td>• Inability to analyse received load to determine if a prohibited substance was present or not.</td></tr>
<tr><td>• Trackable waste is received without a valid consignment authorisation or transport certificate.</td><td>• Enforcement action taken by EPA.
• Financial loss.</td></tr>
<tr><td>• The site office employee does not record the appropriate particulars on the waste certificate for trackable waste as</td><td>• Enforcement action taken by EPA.
• Financial loss.</td></tr>
</table>

stipulated within section 46 (1) of the POEO (waste) Regulation 2014.	
• The raw waste (including untreated host plant material) is unloaded and allowed to come into contact with in-treatment and/or finished compost.	• Cross-contamination of in-treatment and/or finished compost. • Requirement to reclassify all contaminated material as untreated host plant material and for the material to be re-composted. • Financial loss. • Contravention of *CA-05*. • Enforcement action taken by the DPI.
• The delivery and unloading of wastes received at the Facility has not been monitored by a Facility Employee.	• Unloading is conducted incorrectly (i.e. at wrong location or not in discrete piles). • Contamination of surrounding environment, particularly stormwater. • Requirement to dispose of compost and possibly remediate contaminated land. • Significant financial loss. • Enforcement action taken by the DPI and EPA.
• Allowing solid waste to sit, putrefy and release leachate.	• Unnecessary contamination of leachate dam resulting in the souring of the dam and therefore requiring treatment. • Extended release of offensive odours due to increase in surface area. • The integrity of the hardstand pad is compromised. • Increased maintenance of released leachate (i.e. containment, collection and reincorporation).
• Release of offensive or noxious odour beyond the boundary of the Facility during: o Unloading; o Mixing; o Time of covering; or o Overloading moisture %.	• Nuisance complaints from an odour sensitive place. • Attraction of and the proliferation of vermin or vectors. • Enforcement action taken by the EPA.
• Trucks exiting the GRCF and which were utilised to transport host plant material have not performed a clean down of the vehicle (i.e. wheels, undercarriage and mud flaps).	• Contravention of *CA-05*. • Enforcement action taken by the DPI.
• The amount of greenwaste (absorbent material) is not adequately sized to create a bund to receive liquid waste. • Greenwaste bund not constructed tight enough.	• Release of liquid waste to the hardstand pad that could possibly lead to odour nuisance. • Destruction of the hardstand pad.

Control Measures:

Waste Receival

- All incoming waste delivery vehicles must be assigned a unique identification number. This will enable Bio-Recycle to track the processing of wastes.
- The weighbridge attendant must ensure that all incoming loads of waste are consistent with the GRCF's waste acceptance criteria detailed in *Appendix 1 – Table 1* after this procedure.
- The site office attendant must ensure that all necessary waste documentation and a verbal description of the waste are provided by the driver, including a Plant Health Assurance Certificate (PHAC) for loads of host plant material. The written and verbal description of the load must be consistent otherwise the load must be investigated.
- The site office attendant must ensure any 'trackable wastes' listed in *Appendix 1 – Table 2* and *Appendix 1 – Table 3* after this procedure are accompanied by a valid consignment authorisation and waste transport certificate (Section 46 (3) - *Protection of the Environment Operations (Waste) Regulation 2014)*. The sections for the 'receiving facility' must be completed.
- The Site Manager must ensure that the required information as required by Section 46 (1) of the *Protection of the Environment Operations (Waste) Regulation 2014 is provided on the waste certificate.*
- The Site Manager must ensure that the completed waste transport certificates are forwarded and received by the Environment Protection Authority (EPA) within 3 days of the waste arriving. The details can be submitted online using the EPA online waste tracking system.
- Ensure that the Site Manager is informed of any non-conformances identified in the consignment authorisation and/or the waste transport certificate. The Site Manager must promptly report the non-conformances to the EPA.
- Ensure that a sample of liquid waste is obtained at the time of delivery. This sample must be held for 30 days in a fridge so as to keep cool. The sample may be useful in determining at a later date the presence of a prohibited substances or assist in determining why a compost windrow has not commenced efficient composting.

Note: The publication *Waste tracking for receiving facilities* briefly summarises the waste tracking requirements for waste receival facilities and is available on the EPA website (Department of Environment & Climate Change NSW, 2007).

Waste Unloading

- After the exchange of all necessary waste documentation, the site office attendant must provide the waste delivery driver to the designated unloading area of the active composting or air drying pad and any additional instructions regarding unloading.
- All waste unloading must be supervised by a Facility Employee.
- Ensure that liquid or liquescent wastes are unloaded into a tight greenwaste bund or bunds large enough for the anticipated load. The base of the bund must be lined with greenwaste to prevent the waste resting directly atop the composting pad which could compromise the structural integrity of the hardstand pad.
- The amount of the liquid delivered to windrow bunds must not exceed a volume that creates a moisture content of greater than 50% weight for weight (w/w) when mixed with the greenwaste.
- If any liquid or liquescent wastes break through or overtops the bund, unloading must cease until the bund is reformed and any spilt waste is cleaned up in accordance with **Emergency Procedure 2 – Spill Management** (refer to **Appendix 2**). The spill waste can be incorporated with raw waste for the construction of new windrows.
- The waste load must be inspected upon deposition on the composting pad to ensure that it is consistent with the description of the waste in the documentation and to ensure that comingled prohibited wastes are not received.
- Any prohibited wastes (i.e. wastes which Bio-Recycle is not approved to receive) must be managed in accordance with the '*Unintentional Acceptance of Prohibited Waste*' section below.

- Ensure that putrefying wastes, which are in an advanced state of decay and are highly odorous, are not accepted at the Facility. Such wastes must be managed in accordance with the '*Unintentional Acceptance of Prohibited Waste*' section below.
- If offensive odours are released from waste, consideration must be given to the use of odour abatement products, such as Effective Microorganisms (EM) or BioAktiv, to suppress odour.
- Ensure all wastes are immediately mixed and constructed into an open windrows **Workplace Procedure 2 - Open Windrow Construction & Maintenance** (i.e. carbon to nitrogen ratio of 25-30:1, homogenously mixed and moisture content of 45-50% w/w).
- Care must be taken to ensure that raw wastes (including untreated host plant material) do not come into contact with in-treatment windrows or compost windrows in accordance with **Workplace Procedure 4 – Cross-Contamination Prevention and Cleandown**.
- In the instance of host plant material being received, ensure that delivery vehicle containers are washed down in the truck wash on the active composting pad and inspected to ensure that they are free of soil and plant material before exiting the pad (refer to **Workplace Procedure 4 – Cross-Contamination Prevention and Cleandown**).
- Ensure that any vehicles, containers, plant and equipment used for the management of raw wastes or in-treatment compost are free of soil and plant material before it is utilised for the management of more mature in-treatment and/or finished compost (refer to **Workplace Procedure 4 – Cross-Contamination Prevention and Cleandown**).
- Ensure that any spills of waste are cleaned up immediately in accordance with **Emergency Procedure 2 – Spill Management** (refer to **Appendix 2**).

Unintentional Acceptance of Prohibited Waste

- As soon as practicable after identifying prohibited waste which has been unintentionally accepted at the GRCF inform the waste delivery vehicle driver that they must reload the waste and transport it to a facility that can lawfully accept such wastes.
- However, if the waste delivery vehicle has already left the GRCF, separate the waste and determine an appropriate temporary storage method to minimise or prevent environmental harm prior to its removal.
- Report the acceptance of the prohibited waste to the Managing Director (or the Site Manager if the former is unavailable).
- The Managing Director or Site Manager must determine and record the details of the transporter who delivered the prohibited waste.
- As soon as practicable, the Site Manager must organise for the waste to be removed by an approved transporter and taken to a facility that can lawfully accept such waste.
- Where necessary, issue a written warning to the transporter who delivered the prohibited waste. The warning must explain the consequence of contravening the conditions of use and that if the contravention is repeated; no further waste will be received from that transporter. The EPA must be advised of the delivery.
- Ensure any consignments of host plant material are accompanied by a PHAC.
- Ensure that any trackable waste is accompanied by a consignment authorisation and waste transport certificate upon leaving the site.
- The Site Manager must inform the EPA of all instances of the unintentional acceptance of prohibited waste. The Department of Primary Industries (DPI) must also be notified if the said prohibited waste is contaminated with host plant material.

Record Keeping:

- A record must be kept of all waste loads accepted at the GRCF; including any observations made about the waste (refer to **Appendix 3, Form 2 – Waste Receival Record**). For loads of host plant material **Form 3 – Record of Receipt of Host Plant Material** must also be completed (refer to **Appendix 3 – Forms and Checklists**).

- A record must be kept of the source, volume, composition and characteristics of unintentionally accepted prohibited waste (refer to **Appendix 3, Form 4 – Contaminant Characteristics Report**). These recorded must be reported to the EPA and the DPI (when appropriate).
- The details of spill events and consequent corrective action must be recorded as outlined in Emergency Procedure 2 **Emergency Procedure 2 – Spill Management** (refer to **Appendix 2**).

Responsibility and Communication:

- All Facility Employees engaged in the above mentioned activities are responsible for ensuring that the control measures are met.
- The Site Manager is responsible for ensuring that records are collected and maintained.
- If a transport company does not comply with the directions given by a Facility Employee or the Site Manager; it is the responsibility of the Site Manager to record and report the incident to the Managing Director.
- The Site Manager must ensure that the front end loader (FEL) operator is proficient in all aspects of FEL operation.
- The unintentional acceptance of prohibited waste must be reported to the Managing Director for corrective action (as necessary), recording and reporting to the relevant administering authority/authorities.
- If a waste transporter delivers a load or part load of prohibited waste, it is the responsibility of the Managing Director to ensure that they are warned that a repeat contravention will lead to refusal of their waste loads at the GRCF.
- All incidents must be reported to the Site Manager for corrective action (as necessary), recording and reporting to the relevant administering authority/authorities.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*; and
- *Protection of the Environment Operations (Waste) Regulation 2014*.

Appendix 1 – Table 1: Wastes authorised to be received at the GRCF and the associated waste tracking codes (alphabetically listed)

Waste Type	**Is the waste trackable?**	**Waste tracking code**
Garden waste, wood waste	No	NOT REQUIRED
Biosolids	Yes (Interstate only)	K130
Fly Ash	Yes	N150
Grease Trap Waste (Treated)	Yes (interstate only)	K110
Animal Wastes	Yes (Interstate only)	K100
Lime	No	NOT REQUIRED
Waste that meets all the conditions of a resource recovery exemption under Clause 51A of the *Protection* of the Environment Operations (Waste) Regulation 2005		
Any waste received on site that is below licensing thresholds in Schedule 1 of the POEO Act, as in force from time to time		

Appendix 1 – Table 2: Waste description listed by waste tracking codes

Source: Table 1 of the *Waste Tracking Fact Sheet – Protecting the environment and your business* (Environment Protection Authority, 2007).

Waste code	Description
A100	Waste resulting from surface treatment of metals and plastics
A110	Waste from heat treatment and tempering operations containing cyanides
A130	Cyanides (inorganic)
B100	Acidic solutions or acids in solid form
C100	Basic solutions or bases in solid forms
D100	Metal carbonyls
D110	Inorganic fluorine compounds excluding calcium fluoride
D120	Mercury; mercury compounds
D130	Arsenic; arsenic compounds
D140	Chromium compounds (hexavalent and trivalent)
D150	Cadmium; cadmium compounds
D160	Beryllium; beryllium compounds
D170	Antimony; antimony compounds
D180	Thallium; thallium compounds
D190	Copper compounds
D200	Cobalt compounds
D210	Nickel compounds
D220	Lead; lead compounds
D230	Zinc compounds
D240	Selenium; selenium compounds
D250	Tellurium; tellurium compounds
D270	Vanadium compounds
D290	Barium compounds (excluding barium sulphate)
D300	Non toxic salts
D310	Boron compounds
D330	Inorganic sulphides
D340	Perchlorates
D350	Chlorates
D360	Phosphorous compounds excluding mineral phosphates
E100	Waste containing peroxide other than hydrogen peroxide
F100	Waste from the production, formulation and use of inks, dyes, pigments, paints, lacquers and varnish
F110	Waste from the production, formulation and use of resins, latex, plasticisers, glues and adhesives
G100	Ethers
G110	Organic solvents excluding halogenated solvents
G150	Halogenated organic solvents
G160	Waste from the production, formulation and use of organic solvents
H100	Waste from the production, formulation and use of biocides and phytopharmaceuticals
H110	Organic phosphorous compounds
H170	Waste from manufacture, formulation and use of wood-preserving chemicals
J100	Waste mineral oils unfit for their original intended use
J120	Waste oil/water, hydrocarbons/water mixtures or emulsions
J160	Waste tarry residues arising from refining, distillation, and any pyrolytic treatment
K100	Animal effluent and residues (abattoir effluent, poultry, and fish processing wastes)**
K110	Grease trap waste**

K130	Sewage sludge and residues including nightsoil and septic tank sludge**
K140	Tannery wastes including leather dust, ash, sludges and flours**
K190	Wool scouring wastes**
M100	Waste substances and articles containing or contaminated with polychlorinated biphenyls, polychlorinated napthalenes, polychlorinated terphenyls and/or polybrominated biphenyls
M150	Phenols, phenol compounds including chlorophenols
M160	Organo halogen compounds – other than substances referred to in this Table
M170	Polychlorinated dibenzo-furan (any congener)
M180	Polychlorinated dibenzo-p-dioxin (any congener)
M210	Cyanides (organic)
M220	Isocyanate compounds
M230	Triethylamine catalysts for setting foundry sands
M250	Surface active agents (surfactants), containing principally organic constituents and which may contain metals and inorganic materials
M260	Highly odorous organic chemicals (including mercaptans and acrylates)
N100	Containers and drums that are contaminated with residues of substances referred to in this Table*
N120	Soils contaminated with a substance or waste referred to in this Table*
N140	Fire debris and fire wash waters
N150	Fly ash
N160	Encapsulated, chemically-fixed, solidified or polymerised wastes
N190	Filter cake
N205	Residues from industrial waste treatment/disposal operations
N220	Asbestos**
N230	Ceramic-based fibres with physio-chemical characteristics similar to asbestos
R100	Clinical and related wastes
R120	Waste pharmaceuticals, drugs and medicines
R140	Waste from the production and preparation of pharmaceutical products
T100	Waste chemical substances arising from research and development or teaching activities, including those which are not identified and/or are new and whose effects on human health and/or environment are not known
T120	Waste from the production, formulation and use of photographic chemicals and processing materials
T140	Tyres**
T200	Waste of an explosive nature not subject to other legislation

***Must be traced within NSW and interstate.**
****Only required to be tracked interstate.**

Appendix 1 – Table 3: Waste tracking codes listed by waste description

Source: Table 1 of the *Waste Tracking Fact Sheet – Protecting the environment and your business* (Environment Protection Authority, 2007).

Description	Waste code
Acidic solutions or acids in solid form	B100
Animal effluent and residues (abattoir effluent, poultry, and fish processing wastes)**	K100
Antimony; antimony compounds	D170
Arsenic; arsenic compounds	D130
Asbestos**	N220
Barium compounds (excluding barium sulphate)	D290
Basic solutions or bases in solid forms	C100
Beryllium; beryllium compounds	D160
Boron compounds	D310
Cadmium; cadmium compounds	D150
Ceramic-based fibres with physio-chemical characteristics similar to asbestos	N230
Chlorates	D350
Chromium compounds (hexavalent and trivalent)	D140
Clinical and related wastes	R100
Cobalt compounds	D200
Containers and drums that are contaminated with residues of substances referred to in this Table*	N100
Copper compounds	D190
Cyanides (inorganic)	A130
Cyanides (organic)	M210
Encapsulated, chemically-fixed, solidified or polymerised wastes	N160
Ethers	G100
Filter cake	N190
Fire debris and fire wash waters	N140
Fly ash	N150
Grease trap waste**	K110
Halogenated organic solvents	G150
Highly odorous organic chemicals (including mercaptans and acrylates)	M260
Inorganic fluorine compounds excluding calcium fluoride	D110
Inorganic sulphides	D330
Isocyanate compounds	M220
Lead; lead compounds	D220
Mercury; mercury compounds	D120
Metal carbonyls	D100
Nickel compounds	D210
Non toxic salts	D300
Organic phosphorous compounds	H110
Organic solvents excluding halogenated solvents	G110
Organo halogen compounds – other than substances referred to in this Table	M160
Perchlorates	D340
Phenols, phenol compounds including chlorophenols	M150
Phosphorous compounds excluding mineral phosphates	D360
Polychlorinated dibenzo-furan (any congener)	M170
Polychlorinated dibenzo-p-dioxin (any congener)	M180
Residues from industrial waste treatment/disposal operations	N205
Selenium; selenium compounds	D240

Sewage sludge and residues including nightsoil and septic tank sludge**	K130
Soils contaminated with a substance or waste referred to in this Table*	N120
Surface active agents (surfactants), containing principally organic constituents and which may contain metals and inorganic materials	M250
Tannery wastes including leather dust, ash, sludges and flours**	K140
Tellurium; tellurium compounds	D250
Thallium; thallium compounds	D180
Triethylamine catalysts for setting foundry sands	M230
Tyres**	T140
Vanadium compounds	D270
Waste chemical substances arising from research and development or teaching activities, including those which are not identified and/or are new and whose effects on human health and/or environment are not known	T100
Waste containing peroxide other than hydrogen peroxide	E100
Waste from heat treatment and tempering operations containing cyanides	A110
Waste from manufacture, formulation and use of wood-preserving chemicals	H170
Waste from the production and preparation of pharmaceutical products	R140
Waste from the production, formulation and use of biocides and phytopharmaceuticals	H100
Waste from the production, formulation and use of inks, dyes, pigments, paints, lacquers and varnish	F100
Waste from the production, formulation and use of organic solvents	G160
Waste from the production, formulation and use of photographic chemicals and processing materials	T120
Waste from the production, formulation and use of resins, latex, plasticisers, glues and adhesives	F110
Waste mineral oils unfit for their original intended use	J100
Waste of an explosive nature not subject to other legislation	T200
Waste oil/water, hydrocarbons/water mixtures or emulsions	J120
Waste pharmaceuticals, drugs and medicines	R120
Waste resulting from surface treatment of metals and plastics	A100
Waste substances and articles containing or contaminated with polychlorinated biphenyls, polychlorinated napthalenes, polychlorinated terphenyls and/or polybrominated biphenyls	M100
Waste tarry residues arising from refining, distillation, and any pyrolytic treatment	J160
Wool scouring wastes**	K190
Zinc compounds	D230

Workplace Procedure 2 – Open Windrow Construction & Maintenance

Environmental Commitment:

- To ensure that open windrow composting facilitates the effective pasteurisation of raw wastes (including host plant material) in accordance with:
  - *CA-05 Biosecure transport and treatment of host plant material destined for recycling or waste* (*CA-05*); and
  - *Australian Standard 4454 Composts, soil conditioners and mulches* (*AS 4454*).

Note: 'Host plant material' refers to organic waste, such as food and garden waste, that is contaminated with or is potentially contaminated with Phylloxera due to its provenance within the Sydney Phylloxera Infested Zone (PIZ).

Identification of Issues:	**Potential Impacts:**
• Non-homogeneous mixing of solid waste. • The introduction of liquid waste and/or water that results in a moisture content of greater than 50% weight for weight (w/w).	• The onset of anaerobic activity. • An uneven distribution of the carbon to nitrogen (C: N) ratio resulting in an uneven composting regime. • Uneven aeration profile, leading to offensive odour when windrows are opened. • Loss of nutrients, such as nitrogen, phosphorus and sulphur. • Leachate releases that could subsequently contaminate stormwater, release offensive or noxious odour resulting in nuisance complaints. • Attraction and proliferation of vermin or pests. • Spontaneous combustion.
• The addition of lime to high nitrogenous based waste.	• Release of ammonia resulting in odour nuisance and a loss of nutrients.
• Liquid wastes are not unloaded into a tight greenwaste bund.	• Spillage of contents across hardstand pad with the spreading of offensive odour. • Enforcement action taken by the EPA.
• Insufficient moisture content of open windrows when turned.	• Dust and particulate release from turning activities. • Health impacts to onsite personnel, such as to their lungs and eyes. • Microorganism activity decreased. • Compost does not proceed efficiently whereby pasteurisation temperatures are not reached. • Immature compost which still contains pathogens and weed species causes contamination if applied to soil. • Enforcement action taken by the EPA. • Contravention of *CA-05*. • Enforcement action taken by the DPI if the compost was composed of host plant material.
• Windrows are not constructed parallel to stormwater flows.	• Excessive leaching occurs.

	• Unnecessary contamination of stormwater and leachate containment basin. • Cross-contamination of in-treatment or finished compost with less mature in-treatment compost or raw wastes. • Contravention of *CA-05*. • Enforcement taken by the DPI.

Control Measures:

- Ensure that all waste received at the GRCF are unloaded correctly (i.e. liquid and liquescent wastes are unloaded to a tight greenwaste bund) (refer to **Workplace Procedure 1 – Waste Receival and Unloading**).
- Ensure that incoming wastes are mixed promptly upon unloading as outlined below.
- Ensure that nitrogenous-based wastes are added to obtain a carbon to nitrogen (C: N) ratio of 25-30:1. Another C: N ratio may be utilised depending on the end product desired.
- Ensure that liquid wastes and/or water are added to the mixed wastes so as to attain a moisture content of 45-50% w/w. It is better to approach the desired moisture content from sprinkling water on to the finished windrow than trying to cut it back from a higher percentage. It is far less messy.
- Ensure that wastes are homogenously mixed.
- Ensure that windrows are constructed parallel to stormwater flows.
- Do not add lime at the beginning of the open windrow cycle that contains high nitrogenous-based waste as ammonia could volatilise.

Post Construction

- Do not sandwich or compress composting material.
- Ensure that the moisture content of the windrows area maintained at 45-50% w/w. This can be lowered if excessive leaching is occurring, but should not be reduced below 30% weight for weight. If the windrows become excessively wet from either over watering or rainfall, the windrows must be managed in accordance with **Workplace Procedure 14 – Rain-Induced Anaerobic Windrows**.
- It is recommended that windrows are covered during times of excessive rainfall to prevent anaerobic activity predominating in the windrows.
- Each completed open windrow must be monitored daily to ensure leachate breakout does not occur (refer to **Appendix 3, Form 10 – Daily Windrow Observation**). If leachate is observed prompt corrective action must be taken; sawdust, finished compost or soil should be used to absorb excess leachate and reincorporated into the relevant windrow.
- Ensure that all open windrows are monitored daily and the carbon dioxide level recorded in accordance with **Workplace Procedure 6 – Carbon Dioxide Monitoring**.
- Ensure that all open windrows are monitored daily and the temperatures recorded in accordance with **Workplace Procedure 5 – Temperature Monitoring**.
- Once the temperature of and open windrow has been maintained at a temperature greater than 55°C (the pasteurisation temperature) for three consecutive days, the windrow can be turned with either a front end loader or a windrow turner. Be careful of the first turning event as volatile odours could be present. It may be beneficial to allow for an extra 2-3 days before turning occurs.
- If the temperature probe utilised to monitor the temperature of the windrows has:
  - an accuracy of less than ± 1% over the calibrated range then the pasteurisation temperature adopted at the GRCF must be 55°C; or
  - an accuracy of greater than ± 1% but less than 2 % over the calibrated range then the pasteurisation temperature adopted at the GRCF must be 57°C. This will ensure that a pasteurisation temperature of 55°C is in fact achieved in accordance with *CA-05* and *AS 4454*.
- Ensure that each windrow is subject to a minimum of three turning events in accordance with *CA-05* and *AS 4454*.

- When the treatment of wastes is complete, the temperature monitoring data must be reviewed to verify that the material has met the treatment requirements as detailed above. Any material which does not meet this requirement must recommence the treatment cycle so as to finalise treatment.
- Once treatment is verified the material can be transferred to the finished compost stockpile area of the active composting pad for maturation. After a minimum of two weeks of maturation, the finished compost can be transferred to the 'Finished product storage / Truck loading area' ready for transport offsite.
- If the temperature of a windrow at any time exceeds 67°C the windrow must be managed in accordance with **Workplace Procedure 5 – Temperature Monitoring** or **Workplace Procedure 7 Spontaneous Combustion Prevention** respectively.
- Ensure that finished compost is dried to 35% w/w before it is subject to screening.
- Ensure that sorting and screening does not occur when wind speeds are excessive.

Record Keeping:

- Record the volume or weight of the individual inputs and any additives that have gone into creating the windrow (refer to **Appendix 3, Form 8 – Starting Recipe and Adjustments Performed to Windrows**).
- Record the starting moisture percentage for each windrow (refer to **Appendix 3, Form 9 – Windrow Moisture Content Record**).
- Windrow temperature must be recorded as required (refer to **Workplace Procedure 5 – Temperature Monitoring**).
- Record observations from the daily inspection of windrows (refer to **Appendix 3, Form 10 – Daily Windrow Observation**).
- Record when the windrows are turned (refer to **Appendix 3, Form 12 – Temperature Profile**).

Responsibility and Communication:

- All Facility Employees engaged in the construction of open windrows must ensure that the above control measures are met.
- The Site Manager is responsible for ensuring that records are collected and maintained.
- The Site Manager must ensure that the front end loader (FEL) operator is proficient in all aspects of FEL operation.
- The Site Manager is responsible for ensuring that windrows are monitored daily in accordance with **Workplace Procedure 5 – Temperature Monitoring** and are turned as and when required.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*.

Workplace Procedure 3 – Finished Compost Stockpile Management

Environmental Commitment:

- To ensure that stockpiles of finished compost are managed to effectively maintain beneficial populations of aerobic bacteria.

Identification of Issues:	Potential Impacts:
• Finished compost stockpiles are not turned when required.	• The aerobic bacteria suffocate and anaerobic bacteria predominate in compost. • Loss of nutrients, such as nitrogen, phosphorus and sulphur. • Attraction and proliferation of vermin or pests. • Financial loss due to the requirement to aerate compost until an aerobic state is re-established.
• The water content of the finished compost stockpile is less than 35% weight for weight (w/w).	• Dust and particulate release from turning or loading activities. • Health impacts to onsite personnel, such as to their lungs and eyes. • Microorganism activity decreased. • Financial loss due to providing poor quality product.
• Finished stockpiles are too big.	• The aerobic bacteria suffocate and anaerobic bacteria predominate in compost. • If too dry, a fire hazard exists.
• The water content of the finished compost stockpile is greater than 40% w/w.	• Anaerobic bacteria predominates in compost. • Loss of nutrients, such as nitrogen, phosphorus and sulphur. • Release of offensive odour resulting in nuisance complaints. • Attraction and proliferation of vermin or pests. • Financial loss due to providing poor quality product.

Control Measures:

- Ensure that the finished compost is only transferred to the finished product storage / truck loading area if it is going to be removed from site in under a week. Otherwise finished compost stockpiles must remain on the hardstand pad that it was generated for management or transferred to the blending area for the creation of products.
- Ensure that stockpiles of finished compost are turned regularly to maintain the beneficial populations of aerobic bacteria in the compost.
- Ensure that stockpiles are regularly wetted to maintain a moisture content of 40% w/w.
- Stockpiles of finished compost must be monitored weekly in accordance with **Workplace Procedure 5 – Temperature Monitoring** to ensure that excessive temperatures do not prevail.
- Ensure that if the temperatures of stockpiles exceed 62°C they must be turned to cool and that the moisture content is maintained as desired (40% w/w). However, if temperatures are excessive (> 67°C) the stockpile must be managed as outlined in **Workplace Procedure 7 – Spontaneous Combustion Prevention**.

- Observation of stockpiles must occur for signs of excessive heating, charring, smoke and odours of burning.
- It is recommended that the finished windrows are covered during periods of excessive rainfall to ensure that the windrows do not become saturated causing anaerobic activity to predominate in the stockpiles.
- If finished compost stockpiles do become saturated they must be managed in accordance with **Workplace Procedure 14 – Rain-Induced Anaerobic Windrows** to ensure that anaerobic activity does not predominate in the stockpiles.
- If finished compost is allowed to become anaerobic the compost will not be beneficial to pastures when applied and aerobic conditions should be reinstated before being applied to the pasture.

Record Keeping:

- Observations should be recorded using **Form 10 – Daily Windrow Observation** (refer to **Appendix 3 – Forms and Checklists**).
- Finished compost stockpile temperature must be recorded as required (refer to **Workplace Procedure 5 – Temperature Monitoring**).

Responsibility and Communication:

- All Facility Employees engaged in the maintenance of finished compost must ensure that the above control measures are met.
- The Site Manager is responsible for ensuring that records are collected and maintained.
- The Site Manager is responsible for ensuring that finished compost stockpiles are monitored weekly in accordance with **Workplace Procedure 5 – Temperature Monitoring** and are turned as and when required.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*.

Workplace Procedure 4 – Cross-Contamination Prevention and Cleandown

Environmental Commitment:

- To ensure that cross-contamination between raw wastes, in-treatment compost and finished compost does not occur.
- To ensure that all machinery and equipment (transport vehicles, front end loaders, windrow turners and monitoring equipment etc.) are cleaned down as required to prevent cross-contamination.

Note: 'Host plant material' refers to organic waste, such as food and garden waste, that is contaminated with or is potentially contaminated with Phylloxera due to its provenance within the Sydney Phylloxera Infested Zone (PIZ).

Identification of Issues:	**Potential Impacts:**
• Transport vehicles assigned to the movement of untreated host plant material is used to transport material without being inspected for soil and plant material and cleaned down (as required) prior to being loaded.	• Contravention of CA-05. • Enforcement action taken by the DPI.
• Machinery or equipment used for the movement of raw wastes or in-treatment compost has not been adequately cleaned before being utilised for the movement of more mature in-treatment or finished compost.	• Cross-contamination occurs between raw wastes and in-treatment or finished compost. • Contravention of CA-05. • Requirement to recommence the compost cycle. • Financial loss. • Enforcement action taken by the DPI.
• The monitoring equipment is not cleaned between windrows containing when going from either the least mature to the most mature compost.	• Cross-contamination occurs between in-treatment windrows. • Contravention of CA-05. • Requirement to segregate contaminated material and recommence the compost cycle. • Financial loss. • Enforcement action taken by the DPI.
• Raw wastes are placed up gradient of in-treatment or finished compost.	• Cross-contamination by stormwater flows. • Contravention of CA-05. • Requirement to recommence the compost cycle. • Financial loss. • Enforcement action taken by the DPI.

Control Measures:

- Ensure that all raw wastes and in-treatment compost is isolated from older in-treatment compost (i.e. further along in the treatment cycle) and/or finished compost.

It should be noted that to prevent cross-contamination through stormwater movements, finished compost must be located away from in-treatment compost and raw waste.

- Ensure that the gradient of the hardstand pads are maintained so that stormwater generated travels in a north-south direction.

- Vehicles, plant or equipment which has been used to manage raw wastes or in-treatment compost must be cleaned down prior to being used for the management of in-treatment compost which has progressed further along in the treatment cycle and/or finished compost.

Cleandown of Vehicles, Plant and Equipment

- Ensure that the interior of delivery truck containers that have been used to transport host plant material are washed down at the truck wash area available on the respective hardstand pad.
- Ensure that earthen bunding is installed along two sides of the designated wash down area so as to direct washwater to the designated stormwater and leachate containment basin. Ensure that the earthen bunds are maintained in a structurally integral state to prevent wash waters from encroaching on the compost windrows.
- The back wall of the truck wash area must be constructed from a low greenwaste bund or a low wall of crushed concrete and/or brick to filter gross solids from wash waters. The greenwaste must be occasionally replaced with fresh greenwaste when no longer effective at filtering wash waters and the waste greenwaste composted onsite.
- Ensure that a bed of greenwaste (free of host plant material) is laid in the wash down areas of the composting pad to absorb wash waters before use. Alternatively, crushed concrete and/or bricks can be utilised to line the truck wash area.
- Ensure that the greenwaste used for the construction of the truck wash bund wall and flooring is free of host plant material.
- Ensure that the wash waters from the truck wash area on each composting pad effectively drains to the associated stormwater and leachate containment dam.
- Ensure that the exterior of all delivery trucks that have transported host plant material are not washed down in the existing concrete truck wash bay behind the workshop near the Facility entrance prior to exiting the site. This will minimise the spread of material along haulage roads.
- The following is a typical list of materials and equipment to be used by site personnel as part of the cleaning down of vehicles and machinery:
  - High pressure cleaner;
  - Non-toxic and biodegradable cleaning products (if required);
  - Air compressor with hose and controlled release fitting (nozzle);
  - Shovel; and
  - Broom.
- Ensure that all wash down equipment is operated and maintained in accordance with the manufacturer's specifications.
- Ensure all vehicles, plant and equipment to be washed are positioned within the designated wash down area and are stable and immobile.
- Ensure engine is off, park brake on, wheels chocked and lower all attachments or secure/chock them if they are required up for cleaning (i.e. buckets).
- Examine the item and identify any points that require specific attention. Use of a shovel may be required to remove large chunks of mud etc.
- Remove guards/belly plates to access all areas for cleaning.
- Identify areas that may require cleaning with compressed air rather than water (i.e. for the removal of large objects) and clean these areas with compressed air first.
- Wash down the entire vehicle or piece of machinery with the high pressure cleaner to remove all possible contaminants, i.e. soil and plant material.
- Consideration must be given to utilising a steam cleaner for machinery or equipment being transferred from managing contaminated material to uncontaminated material.
- Ensure area guards, underneath and the upper body or all machinery and equipment is washed down. Refer to checklist below for detail on general areas of machinery or equipment that require washing down.
- Replace guards (belly plates) on heavy machinery removed for cleaning.

- Carry out final inspection to ensure all areas have been cleaned/washed down effectively. Refer to checklist below for detail on general areas of machinery or equipment that require washing down.
- Remove the vehicle/machinery from the wash down area with caution to ensure that no re contamination occurs.
- The general areas of machinery and vehicles that will require cleaning and inspection are listed below:
  - **Excavators** - check all areas, with special attention to:
    - Hollow section chassis channels.
    - Turret pivot area.
    - Channels for hydraulic hoses from drive motor.
    - Counterweight voids spaces.
    - Engine bay floor.
    - Fan shroud and radiator cores.
    - Glacier plate (near radiator).
    - Air filters (shake/tap filters to determine if clean).
    - Removable track adjuster guards and lubrication points.
    - Tool box.
    - Arms/booms – usually the pivot points are the only area of concern.
    - Bucket/blade
    - Between teeth of adapters.
    - Wear plates.
    - Rear blade (stabiliser).
    - Wear plates.
    - Hollow section arms.
    - Hollow section blade.
  - **Front End Loaders** (**FELs**) - check all areas, with particular attention to the following:
    - Feet of adaptors on compactors.
    - Hydraulic points.
    - Articulation points of hydraulics.
    - Brake assemblies.
    - Blade wear plates.
    - Blade teeth and adaptors.
    - FOPS and ROPS canopy.
    - Hollow channels.
    - Void space between cab and body (bird's nests have been found here).
    - Air cleaner and air filters.
    - Internal of cab, floor and mats.
    - Air conditioner unit.
    - Counterweight void spaces.
    - Under and around removable fuel cells.
    - Between dual wheels (where applicable).
    - Check for water filled between wheels or drums.
  - **Dump trucks**
    - Check all areas, with particular attention to the following:
    - Internal of cab, floor and mats, behind and under seats.
    - Air cleaner.
    - Air conditioner unit.
    - Hollow channels in tray frame.
    - Between dual wheels (where applicable).
    - Body and tipper.
  - **Windrow Turner**
    - Check all areas, with particular attention to the following:
    - Internal of cab, floor and mats, behind and under seats.
    - Hydraulic points.

- Blade teeth and adaptors.
- Rotating cylinder.
- Air conditioner unit.
- Hollow channels in tray frame.
- Between dual wheels (where applicable).
- Body and tipper.

Record Keeping:

- All inspections of vehicles, machinery, and equipment and corrective action must be recorded (refer to **Appendix 3, Form 16 – Equipment Inspection Record**).

Responsibility and Communication:

- All Facility Employees that are engaged in the above mentioned activities are responsible for ensuring control measures are met.
- The Site Manager is responsible for ensuring that all Facility Employees are effectively trained in cross-contamination prevention.
- The Site Management must ensure that any contaminated material is re-composted.
- The Site Manager is responsible for ensuring that records are collected and maintained.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*; and
- *Plant Diseases Act 1924*.

Workplace Procedure 5 – Temperature Monitoring

Environmental Commitment:

- To ensure that temperature monitoring occurs daily to demonstrate efficient composting/treatment of raw wastes (particularly host plant material).
- To ensure that temperatures lower than 55°C and above 67°C are avoided.
- To ensure that windrows are turned as required for effective composting.

Identification of Issues:	**Potential Impacts:**
• Improper or irregular temperature profiling.	• A lack of understanding as to where the composting cycle is at, possibly resulting in unfinished compost being classified as finished. • Temperature rises above 67°C killing beneficial microorganisms resulting in the reduced quality of compost. • Windrows not being turned as required based on the temperature profile.
• Addition of nitrogen and bacteria that does not result in significant microbial activity and an increase in temperature.	• Likely that compost has become contaminated with an antagonist or a toxicant. • Financial loss due to requirement
• Non-regular maintenance or calibration of temperature probe.	• Incorrect temperature values obtained with detrimental impacts to the composting process and quality of compost.
• Incorrect temperature parameter set (i.e. Fahrenheit instead of Celsius).	• Inappropriate time to turn windrow resulting in poor pasteurisation. • Contravention of *CA-05*. • Enforcement action taken by the DPI.
• Temperatures exceeding 67°C.	• The killing of beneficial microorganisms resulting in the reduced quality of compost.
• Insufficient nitrogen amount added and or adequate amounts of moisture.	• Composting process not initiated. • Contravention of *CA-05*. • Enforcement action taken by the DPI.

Control Measures:

- Ensure that the open windrow, hand held monitoring probe is cleaned and free of soil and plant material between windrows. Alternatively perform temperature monitoring from the oldest windrow to the youngest (refer to **Workplace procedure 4 – Cross-Contamination Prevention and Cleandown**).
- Ensure that all material to be composted is homogenously mixed with the moisture content ranging between 45-50% weight for weight (w/w).
- Ensure that temperature probe and meter are in good working order by adhering to manufacturer specifications for calibration and maintenance.
- Ensure carbon to nitrogen (C: N) ratios of the initial compost mixtures is not < 25:1.
- Ensure temperature probe is set on degrees Celsius (°C).

- Ensure that temperatures are taken daily at three (3) points from the centre of the windrow to no more than 3 inches from the outside of the windrow at four (4) points (equidistant from one another) along the length of the windrow. These twelve temperatures must be recorded on **Form 11 – Temperature Monitoring Record** and then these values must be averaged and recorded (refer to **Appendix 3 – Forms and Checklists**).
- Ensure that the average windrow temperatures are summarised on **Form 12 – Temperature Profile** (refer to **Appendix 3 – Forms and Checklists**).

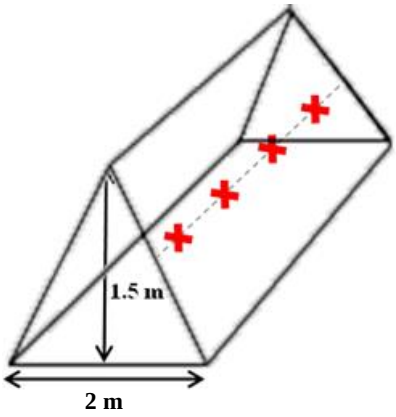


Figure 1: 3D diagram outlining the points (X) along the windrow where temperature measurements are taken (the points are equidistant to one another).

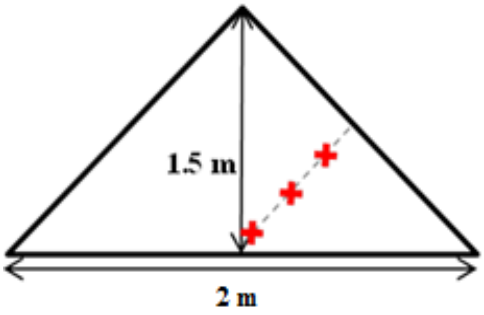


Figure 2: Cross-sectional diagram showing the points (X) at which temperature measurements are taken (the points are equidistant to one another, and no more than 3 inches from the surface of the windrow).

- Ensure a temperature measurement is obtained from the upper third section of the windrow as the highest temperatures are found here.
- If excessive steam or heat is experienced to be emanating from a certain point in the windrow, increase and concentrate temperature monitoring in this area.
- If the temperature of the windrow at any time exceeds 67°C the windrow must be turned. A light sprinkling of water to dissipate heat maybe required with open windrows. Once reformed, the temperature of the windrow must be closely monitored.
- If turning fails to suppress temperature, within an acceptable time frame (e.g. 24 hours) consideration will be given to the addition of water as required. Importantly, the moisture content of 45-50% w/w must not be exceeded if water is to be added to windrow(s).
- If only a certain section of the windrow reaches 67°C then that part of the windrow is to be turned.
- Temperatures greater than 67°C may indicate that the starting mixture is too rich in nutrient such as nitrogen. If this is the case, the windrow should be reformed with fresh greenwaste and re-composted from the start of the composting process.
- Ensure that if the temperature of a windrow is greater than 67°C, the windrow must be managed in accordance with **Workplace procedure 7 – Spontaneous Combustion Prevention.**

Record Keeping:

- Record all temperatures obtained from windrows daily (refer to **Appendix 3, Form 11 – Temperature Monitoring Record**). The average daily temperature is recorded (refer to **Appendix 3, Form 12 – Temperature Profile**).
- Record the calibration of the temperature probe (refer to **Appendix 3, Form 22 – Calibration Record**).
- Record all maintenance and replacement of temperature monitor and probe (refer to **Appendix 3, Form 5 – Daily Running Sheet**).

Responsibility and Communication:

- All Facility Employees that are engaged in the above mentioned activities are responsible for ensuring control measures are met.
- The Site Supervisor is responsible for the recording of temperature profiles as required.
- The Site Manager is responsible for ensuring that records are collected and maintained.
- The Site Supervisor is to inform the Managing Director of when temperatures exceed 67°C.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*.

Workplace Procedure 6 – Carbon Dioxide Monitoring

Environmental Commitment:

- To ensure that the required level of oxygen is found within the open windrow to enable the proliferation of aerobic micro-life required for the creation of humified compost.
- To ensure that open windrows are turned as required for effective composting to occur.

Identification of Issues	Potential Impacts
• Improper or irregular CO_2 profiling.	• A lack of understanding as to where the composting cycle is at, possibly resulting in unfinished compost being classified as finished. • CO_2 values rises above the limits recommended (8-12% and 12-15%) for the various stages of the composting process, resulting in the killing of aerobic micro-life and reduced quality of compost. • Generation of anaerobic conditions, with subsequent impacts (odour release, vermin attraction etc.). • Windrows not being turned as required based on the CO_2 values.
• Non-regular maintenance or calibration of CO_2 probe.	• Incorrect CO_2 values obtained with detrimental impacts to the composting process and quality of compost.
• Open windrows are not turned as required based on average CO_2 values • During the first 10 days of the open windrow the average CO_2 values exceeds 8 – 12%. • The average CO_2 values exceed 15 - 20%.	• The killing of beneficial aerobic microorganisms resulting in the reduced quality of compost. • Generation of anaerobic conditions, with subsequent impacts (odour release, vermin attraction).

Control Measures:

- **CO_2 is a heavy gas that settles into the bottom of the compost windrow. Therefore, CO_2 must always be measured from the centre bottom of the windrows.**
- **When a composting process does not develop CO_2 the process is not aerobic. Therefore, CO_2 developing within a windrow is a good sign.**
- **If the CO_2 concentration exceeds the recommended values (highlighted below) aerobic microorganisms are suffocated and the process will revert to anaerobic conditions.**

- Ensure that all material to be composted is homogenously mixed with the moisture content ranging between **45% and 50% weight for weight (w/w)**.
- Ensure that the CO_2 probe is in good working order by adhering to manufacturer specifications for calibration and maintenance.
- Ensure that CO_2 readings are taken daily from the centre base of the open windrow(s) at 4 points (equidistant from one another) along the length of the windrow. The four CO_2 readings must then be averaged and this average recorded on **Form 13 – Carbon Dioxide Percentage Record** (refer **Appendix 3 – Forms and Checklists**).
- Ensure that no CO_2 value recorded exceeds **15 – 20%**.

- Ensure that windrows are turned once an average CO_2 value of **12 - 15%** is recorded.

Record Keeping:

- Record all CO_2 values obtained from windrows daily (refer to **Appendix 3, Form 13 – Carbon Dioxide Percentage Record**).
- Record when windrows are turned (**Appendix 3, Form 12 – Temperature Profile**).
- Record the calibration of the carbon dioxide probe (refer to **Appendix 3, Form 22 – Calibration Record**).
- Record all maintenance and replacement of CO_2 probe (refer to **Appendix 3, Form 5 – Daily Running Sheet**).

Responsibility and Communication:

- All Facility Employees that are engaged in the above mentioned activities are responsible for ensuring control measures are met.
- The Site Manager is responsible for the recording of CO_2 values as required.
- The Site Manager is responsible for ensuring that records are collected and maintained.
- The Site Manager is to inform the Managing Director of when CO_2 exceed **15 – 20%**.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*.

Workplace Procedure 7 – Spontaneous Combustion Prevention

Environmental Commitment:

- To ensure that materials present within composting windrows do not self-heat to the point of spontaneously combusting.

Identification of Issues	Potential Impacts
• Moisture content of compost is > 50% weight for weight (w/w).	• Anaerobic activity may predominate, creating methane and other flammable gases. Once mixed with oxygen, the heat from chemical reactions set off by excessive microbial heat could ignite a fire. • Release of particulates, ash and smoke thus creating environmental nuisance. • Enforcement action taken by the EPA.
• CO_2 content exceeds 15-20%.	• The killing of beneficial aerobic microorganisms resulting in the generation of anaerobic conditions. • Anaerobic activity may predominate, creating methane and other flammable gases. Once mixed with oxygen, the heat from chemical reactions set off by excessive microbial heat could ignite a fire. • Release of particulates, ash and smoke thus creating environmental nuisance. • Enforcement action taken by the EPA.
• Non-thorough extinguishment of fire.	• Re-ignition of fire causing environmental harm.
• Non-homogeneous mixing of greenwaste, solid and liquid wastes.	• Anaerobic activity may predominate creating methane and alcohols. Once mixed with oxygen, the heat from chemical reactions could ignite a fire.
• Open windrow has a distinct smell of charring or smouldering.	• Mixture is anaerobic and heat from microbial activity has been excessive to the point of initiating chemical reactions thus creating a chain reaction of chemical oxidation that creates a fire. If unattended the likelihood of a larger fire occurring is increased.
• Opening of windrow too early or when unknown excessive heat is being generated.	• Offensive odours may be released. • Spontaneous combustion may occur. • Killing of essential micro flora and fauna within mixture is likely.

Control Measures:

- Ensure windrows are constructed and maintained as specified in **Workplace Procedure 2 – Open Windrow Construction & Maintenance**.
- Ensure that temperature and carbon dioxide are monitored in accordance with **Workplace procedure 5 – Temperature Monitoring** and **Workplace procedure 6 – Carbon Dioxide Monitoring** respectively.
- Ensure that the water input to windrows does not exceed 50% w/w.
- Do not allow windrows to dry out from the top.

- Ensure that enough greenwaste is mixed to effectively absorb free liquids.
- Do not sandwich or compress composting material.
- Monitor temperature of windrows daily (refer to **Workplace procedure 5 – Temperature Monitoring**). This is particularly important in the initial stages of the composting process. It will allow for an understanding of how vigorous microbial activity is, which may require recipe adjustment.
- Ensure that windrows are not opened when temperature is > 80°C until liberal watering has occurred to dissipate heat. The introduction of oxygen could catalyse the ignition of potential smouldering that is occurring and hence methane generated in the centre of the windrow could ignite. Aeration will be required once temperature subsides due to material being over-wetted.
- Make observation as to any smoke liberation, characteristic odour pertaining to smouldering or charring daily, especially when turning windrows.
- If in the event of smouldering or a fire, the windrow must be doused with water and/or soil to extinguish the flames. The windrow must then be pulled apart. If weather conditions are such that the pulling apart of the windrows will ignite other windrows or internal or external property, dousing with water and soil will occur so as to smother the fire. When weather stabilises, particularly wind conditions, the windrow can be pulled apart and sequentially inundated with water to effectively extinguish the fire (refer to **Appendix 2)**.
- Cool down open windrow by turning and mixing. Adjust moisture content at this time if needed.
- If the windrows become excessively wet from either over watering or rainfall, the windrows must be managed in accordance with **Workplace Procedure 14 – Rain-Induced Anaerobic Windrows** to prevent the predominance of anaerobic conditions forming which could produce gases which could ignite when temperatures are excessive (spontaneous combustion).

Record Keeping:

- Ensure that temperature and carbon dioxide readings are recorded as required (refer to **Workplace procedure 5 – Temperature Monitoring** or **Workplace procedure 6 – Carbon Dioxide Monitoring**).
- Record initial moisture addition and any subsequent additions (refer to **Appendix 3, Form 9 – Windrow Moisture Content Record**).
- Record all observations of any evidence of spontaneous combustion (refer to **Appendix 3, Form 10 – Daily Windrow Observation**).

Responsibility and Communication:

- All Facility Employees that are engaged in the above mentioned activities are responsible for ensuring control measures are met.
- The Site Supervisor is responsible for ensuring that records are collected and maintained.
- It is the responsibility of all Facility Employees to report any evidence or incidence of spontaneous combustion to the Site Supervisor for attention and necessary action.
- The Site Supervisor is to promptly report any incidents of spontaneous combustion to the Managing Director.
- All Facility Employees engaged in the construction of windrows are responsible for the correct addition of water to obtain the appropriate moisture content of 45-50% w/w.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*.

Workplace Procedure 8 – Quality Limits Sampling

Environmental Commitment:

- To ensure that the obtaining of samples to determine the quality characteristics of final compost blends comprised of biosolids is undertaken to ensure that environmental harm is avoided.

Identification of Issues	**Potential Impacts**
• A composite sample representing 500 dry solid tonnes (dst) of finished soil conditioning product is not sampled.	• Unknown quality of final product. • Possible contamination of air, water and land environments if final product sent offsite for use. • Enforcement by EPA.

Control Measures:

- Ensure that a composite sample representing 500 dry solid tonnes (dst) of finished blends is sent for laboratory analysis (NATA accredited).
- The sample must be representative of a composite sample. The composite sample must be made from obtaining five individual samples. These samples are to be taken at equidistant places along the length of the finished windrow (refer to **Appendix 3, Form 15 – Quality Limits Sampling Checklist**).
- The following parameters in *Table 1* below must be analysed from the sample to determine if the final product is suitable for intended use.
- Compost should be sampled and tested to determine status (i.e. finished composting).
- If following a turning event with the compost at an appropriate moisture percentage (45-50% weight for weight (w/w)), the temperature of a windrow stabilises to be approximately equal to the ambient air temperature then windrow can be classified as finished. Additionally the nitrogen draw down index could also be referenced as a more accurate determination of compost completion.

Table 1: Quality characteristic limits for offsite unrestricted and restricted use

	Maximum Limit	
Quality Characteristic	**Unrestricted Use**	**Restricted Use 1**
Arsenic (mg/kg)	20	20
Cadmium (mg/kg)	3	5
Chromium (total) (mg/kg)	100	250
Copper (mg/kg)	100	375
Lead (mg/kg)	150	150
Mercury (mg/kg)	1	4
Nickel (mg/kg)	60	125
Selenium (mg/kg)	5	8
Zinc (mg/kg)	200	700
DDT/DDD/DDE (mg/kg)	0.5	0.5
Aldrin (mg/kg)	0.02	0.2
Dieldrin (mg/kg)	0.02	0.2
Chlordane (mg/kg)	0.02	0.2
Heptachlor (mg/kg)	0.02	0.2
HCB (mg/kg)	0.02	0.2
Lindane (mg/kg)	0.02	0.2
BHC (mg/kg)	0.02	0.2
PCB's (mg/kg)	Not detected	0.3
E. coli (MPN4/gram)*	<100 (dry weight)	

Faecal coliforms (MPN4/gram)*	<1,000 (dry weight)
Salmonella sp.*	Not Detected / 50 grams of final product (dry weight)

only relevant for compost products derived from biosolids.

1. "*Unrestricted Use*" – products suitable for unrestricted use may be used on home lawns and gardens, public contact sites, urban landscaping, agriculture, forestry, soil and rehabilitation, landfill disposal and surface land disposal. These products may be applied in an unrestricted manor to all lands (excluding "protected areas").
2. "*Restricted Use 1*" – products suitable for restricted use may be used on public contact sites, urban landscaping, agriculture, forestry, soil and rehabilitation, landfill disposal and surface land disposal.

The limits for this procedure have been taken from the *Environmental Guidelines: Use and Disposal of Biosolids Products* (NSW Environmental Protection Authority, 2000).

Record Keeping:

- Records must be kept of how many samples are obtained. This should correspond to 1 composite sample representing 500 dst (refer to **Appendix 3, Form 15 – Quality Limits Sampling Checklist**).
- Records must be kept for any new blends that have been created or any adjustments to recipes performed throughout a respective composting process (refer to **Appendix 3, Form 8 – Starting Recipe and Adjustments Performed to Windrows**).
- All quality limit composite samples for all finished products must satisfy the conditions of **Form 15 – Quality Limits Sampling Checklist** (refer to **Appendix 3 – Forms and Checklists**).

Responsibility and Communication:

- The Site Manager must ensure that the samples required are obtained.
- The Managing Director must ensure that the results of the samples obtained are provided to a person or a body who is suitable to make determinations as to the quality of the final blend.
- The Site Manager is responsible for ensuring that records are collected and maintained.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*.

Workplace Procedure 9 – Trial Composting

Environmental Commitment:

- To ensure that the receival and composting of trial feedstocks does not cause environmental harm, including air, water and land pollution.

Identification of Issues:	Potential Impacts:
• Approval has not been sought for a trial of a new feedstock from the EPA.	• Contravention of EPL conditions. • Enforcement action taken by the EPA.
• The trial feedstock contains prohibited contaminants.	• Antagonism or toxicity to the composting process. • Contravention of EPL conditions. • Enforcement action taken by the EPA.
• A sample of the new feedstock is not subject to laboratory analysis at a NATA accredited facility.	• Feedstock could contain prohibited contaminants. • Antagonism or toxicity to the composting process. • Enforcement action taken by the EPA. • Financial loss due to requirement to dispose of all contaminated material.
• The samples for laboratory analysis are not representative of the waste delivered to the GRCF for trialling.	• Antagonism or toxicity to the composting process. • Financial loss due to requirement to dispose of all contaminated material.
• The trial feedstock is highly odorous.	• Nuisance complaints from an odour sensitive place. • Attraction of and the proliferation of vermin or vectors. • Enforcement action taken by the EPA.

Control Measures:

The following stages must be followed when accepting new feedstock for trial composting:

1. **Waste generation investigation** – the waste generator (i.e. the consignor of waste) must be consulted as to what the pertinent characteristics (physiochemical) of the waste are and how it is generated – i.e. the waste is "characterised" to determine if it is a suitable waste that can be considered for inclusion in the composting process. This includes ascertaining whether the waste contains prohibited contaminants and/or large physical objects that may interfere with the homogeneous mixing of the contaminated material.

   In some instances this may require inspection of the facility where the waste was generated and the Site Manager in concert with the suitably qualified person must determine if this is required. If inspection of the generating site is required this investigation will also aid in the assessment of

the suitability of the waste to be handled onsite, particularly in relation to its chemical and physical stability.

Pertinent questions may be required to be answered when assessing the suitability of a certain waste type.

2. **Waste composition review -** If considered necessary by the suitably qualified person, the waste generator must be requested to provide physiochemical analysis (by a NATA approved laboratory) of the waste. This might occur if the suitably qualified person, upon receival of the above information from the waste generator, feels that there is a risk of the waste containing prohibited substances.

   Bio-Recycle must seek the advice of appropriately qualified consultants if there is any doubt that the feedstock can be used in the composting process.

3. **Compost recipe formulation –** if the waste is determined to be suitable for composting with regard to the above considerations, the waste is considered for inclusion in composting and a trial treatment formulation is developed by the suitably qualified person.

4. **Request from EPA to perform a trial** – after steps 1-3 have been completed a letter of request is to be sent to the EPA seeking permission to perform a trial. The permission must include detail as to why it is believed that the said material is suitable for acceptance. EPA may require a variation application to the existing EPL.

5. **Trial design and evaluation** – once approval to perform a trial has occurred, a specific quantity of the waste is to be accepted at the GRCF for inclusion in composting and must be managed in accordance with the relevant workplace procedures.

   The minimum volume of the feedstock to be accepted must be sufficient to make up a single windrow (2.5 m wide × 1.5 m high × 30 m long) at the rate prescribed in the trial recipe formulation devised. All inputs, including additions of moisture, to windrows will be recorded.

   The trial windrow(s) will be assessed and measured over a minimum four month period. An efficacy report will be written by the suitably qualified person which demonstrates the final products conformance with the specifications for onsite use, offsite unrestricted or restricted use.

6. **Written notification of acceptance or refusal** – based on the evidence of the efficacy report the Site Manager will send written notification (letter, email or fax) to the client of the GRCF's ability to accept the feedstock for composting. If the ability exists to compost the said material, a request to vary the EPL will occur to include the said waste to the existing waste acceptance list prior to the ongoing acceptance of the trialled material.

During the composting trial the following must be adhered to:

- Ensure that all wastes received at the GRCF are unloaded correctly (i.e. liquid and liquescent wastes are unloaded to a tight greenwaste bund) (refer to **Workplace Procedure 1 – Waste Receival and Unloading**).

- Ensure that Effective Microorganisms (EM) is stored onsite to treat odorous wastes.
- Ensure that the trial feedstock is formed into a windrow in accordance with **Workplace Procedure 2 –Open Windrow Construction & Maintenance**.
- Obtain samples of incoming trial feedstocks to determine the carbon to nitrogen (C: N) ratios of the wastes. Ensure that when mixing wastes for windrows that a C: N ratio is at least 25:1.

Record Keeping:

- All trial feedstocks delivered to site must be recorded upon receival using **Form 2 – Waste Receival Record**, including any observations about the waste, releases leachate, offensive odour heat or other emissions or is it attracting pests/vectors (refer to **Appendix 3 – Forms and Checklists**).
- If the trial feedstock is organic waste, such as food and garden waste, which is contaminated with or is potentially contaminated with Phylloxera due to its prevalence within the Sydney Phylloxera Infested Zone (PIZ), **Form 3 – Record of Receipt of Host Plant Material** must also be completed upon receival of the waste at the Facility (refer to **Appendix 3 – Forms and Checklists**).
- Record the amount of EM used to inoculate incoming waste (refer to **Appendix 3, Form 8 – Starting Recipe and Adjustments Performed to Windrows**).

Responsibility and Communication:

- All Facility Employees that are engaged in the above mentioned activities are responsible for ensuring control measures are met.
- The Site Manager is responsible for ensuring that records are collected and maintained.
- The Managing Director is responsible for contacting the EPA with regard to getting approval for any trial composting.
- All incidents should be reported to the Site Manager for action (if necessary), recording and reporting to in accordance with attached PIRMP.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*; and
- *Protection of the Environment Operations (Waste) Regulation 2014*.

Workplace Procedure 10 – Dust and Particulate Management

Environmental Commitment:

- To ensure that activities conducted at the GRCF does not cause environmental harm, such as air (dust) pollution.

Identification of Issues	Potential Impacts
• Dust liberation from moving traffic.	• Releases that cause environmental harm. • Potential health impacts to Facility personnel (e.g. eyes and lungs).
• Dust and particulate release from unloading, screening operation or from turning, mixing and movement of compost.	• Releases that cause environmental harm. • Potential health impacts to Facility personnel (e.g. eyes and lungs).
• Complaint received regarding nuisance at a dust sensitive place.	• If serious enough, enforcement action may be taken by the EPA. • The EPA may request that monitoring be performed at a dust sensitive place to determine if compliant with: o Dust deposition = 120 mg/m^2 /day – AS 3580.10 of 1991; or o Solid particulates = 100 mg/m^3 (Schedule 4 of the *Protection of the Environment Operations (Clean Air) Regulation 2010*).

Control Measures:

- Limit traffic to designated internal road ways.
- Limit the speed of onsite traffic to minimise dust release.
- Ensure all hardstand areas of the GRCF (including trafficable areas) are regularly wetted through the use of the water cart. Consideration should be given to the installation of sprinkler in heavily trafficked areas.
- Ensure that daily evaporation is taken into account with regards to applying water as a dust suppressant.
- Consider the use of proprietary products to seal the surface of trafficable areas as necessary.
- Dust and particulate suppression waters should be sourced from the onsite dam(s).
- Before the use of any suppression water sourced from onsite dams sufficient time must be allowed since any recent inflow to these dams to ensure that settlement of any contained sediment(s) has occurred.
- If utilised, ensure that the sprinkler system and water cart are working effectively and are maintained in good working order. The Site Manger is to be promptly told of when either is ineffective or not in working order.
- All waste(s) received at the Facility must be unloaded correctly (refer to **Workplace Procedure 1 – Waste Receival and Unloading**).
- Consider the use of sprinklers or handheld hoses during unloading of dry solid waste(s), if necessary.
- Ensure that moisture content of compost to be screened is of sufficient moisture content or consider the use of sprays at the exit point of the trommel/screening deck.
- Do not conduct screening, turning or mixing activities when wind speeds are excessive.

- Ensure moisture content of windrows is such that dust is not liberated when turning, mixing or movement of the windrow occurs.
- If Bio-Recycle receives a complaint use **Form 25 – Complaint Register** to record all details of the complaint and keep these records updated as the complaint is investigated (refer to **Appendix 3 – Forms and Checklists**).
- If requested by the EPA conduct dust and particulate monitoring in accordance with the relevant Australian Standards.

Record Keeping:

- Record when sprinklers are turned on or when water cart is used. Note the duration of use and keep a record of any maintenance performed (refer to **Appendix 3, Form 17 – Dust Suppression Record**).
- Record daily weather conditions (refer to **Appendix 3, Form 6 – Daily Weather Conditions**).
- In the event of a dust complaint, record and investigate details of this complaint (refer to **Appendix 3, Form 25 – Complaint Regi**ster).
- Record all dust and particulate monitoring requested by the EPA (refer to **Appendix 3, Form 18 – Dust and Particulate Monitoring**).

Responsibility and Communication:

- It is the responsibility of all Facility Employees engaged in the above activities to ensure that the above controls are met.
- The Site Manager is responsible for ensuring that records are collected and maintained.
- It is the responsibility of the Site Manager to allocate tasks and ensure that control measures are implemented as required to minimise the release of dust and particulates that could cause environmental harm.
- The Site Manager is to promptly report to the Managing Director any variance from the control measures that results in environmental harm.
- The Managing Director is responsible for the prompt notification to the EPA if there is a release of dust or particulates that is likely to cause environmental harm.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*.

Workplace Procedure 11 – Odour Management

Environmental Commitment:

- To ensure that the activities undertaken at the GRCF do not cause releases of offensive odour.

Identification of Issues	Potential Impacts
• The overloading of the stormwater and leachate containment dam with high strength waste, leachate or contaminated stormwater.	• The onset of anaerobic activity and the release of offensive and noxious odour. • Enforcement action taken by the EPA.
• Carbon to nitrogen (C:N) ratio of compost mixes is < 25:1.	• The release of ammonia and amines, which results in a net loss of nitrogen from the mixture. • Offsite odour nuisance that attracts enforcement action by the EPA.
• Too much liquid is introduced to the windrows resulting in a moisture content > 50% w/w.	• Oxygen diffusion through the compost is restricted, hence anaerobic activity predominates. • Release of offensive and noxious odours (volatile fatty acids (VFA) and sulphidic type odours).
• The receival of highly odorous (putrefying) wastes (liquid or solid). • Premature movement or turning of a windrow that is anaerobic. • Windrows have turned anaerobic.	• The release of offensive and noxious odour that results in environmental harm at an odour sensitive place. • Enforcement action taken by the EPA.
• Prohibited waste such as putrescible waste has been stockpiled on site.	• The release of offensive or noxious odour that results in environmental harm at an odour sensitive place. • Enforcement action taken by the EPA.
• Odour release from waste(s) being allowed to sit on site and putrefy.	• Nuisance complaints regarding offensive or noxious odours at odour sensitive places. • Stormwater could become unnecessarily contaminated, thereby imparting a load to the containment dam(s). • Attraction and proliferation of vectors or vermin. • Enforcement action by EPA.

Control Measures:

- Ensure that all onsite dams, stormwater and leachate is managed correctly (refer to **Workplace Procedure 12 – Stormwater and Leachate Management and Workplace Procedure 13 – Basin Management**).
- Consider the use of odour abatement products, if required, to eliminate or minimise offensive odour from dams or hardstand surfaces, such as Effective Microorganisms or BioAktiv.
- Ensure that only acceptable wastes are received and unloaded at the GRCF (refer to *Appendix 1 – Table 1* after **Workplace Procedure 1 – Waste Receival and Unloading**).

- Ensure that all wastes accepted are unloaded and managed correctly (refer to **Workplace Procedure 1 – Waste Receival and Unloading**).
- Ensure that all windrows are created as specified within the relevant procedure (refer to **Workplace Procedure 2 –Open Windrow Construction & Maintenance**).
- Mix odorous waste straight away. Do not allow waste to sit in bund or on the hardstand pad to putrefy. Use a proprietary product(s) containing EM in this instance.
- If odorous wastes cannot be immediately incorporated into windrows, cover the waste in greenwaste (must not be host plant material) or sawdust. Then start to construct the windrow. Spray EM whilst this occurs.
- Ensure homogenous mixing occurs.
- Ensure that windrows have enough greenwaste added so that carbon: nitrogen (C: N) ratios are within the desired range of 30-25: 1.
- Ensure that the addition of moisture to windrow mixtures does not result in the onset of anaerobic activity.
- Ensure that all windrows are monitored with regard to temperature and CO_2 as required (refer to **Workplace Procedure 5 – Temperature Monitoring** and **Workplace procedure 6 – Carbon Dioxide Monitoring** respectively).
- If windrows are releasing offensive or noxious odours, turn windrow to increase oxygen. Do not allow open windrow to continue anaerobic breakdown. Consider the use of proprietary products to eliminate or minimise offensive odour. Adjust moisture content by adding inert material or greenwaste if compost is less than two weeks old. If compost is greater than two weeks in age, re-mix and re-start the composting process.
- If Bio-Recycle receives a complaint use **Form 25 – Complaint Register** to record all details of the complaint and keep these records updated as the complaint is investigated (refer to **Appendix 3 – Forms and Checklists**).
- Ensure that odour monitoring is conducted as required when specified by the EPA.
- In the event of an odour release, perform odour monitoring at known odour sources (refer to **Appendix 3, Form 19 – Odour Monitoring** to record odour monitoring). Be sure to go up and down wind of the odour source and record if the characteristic of the odour experienced offsite is similar to odour being released on site – describe the odour using the scale indicated on **Form 19**.
- Ensure that monitoring is completed at any odour sensitive receptors e.g. the nearest residential premises to the odour source.

Record Keeping:

- Record all observations made of windrows pertaining to odour generation (refer to **Appendix 3, Form 10 – Daily Windrow Observation**).
- Record dissolved oxygen (DO), redox potential, electrical conductivity and pH in onsite stormwater containment dams (refer to **Appendix 3, Form 20 – Insitu Stormwater Monitoring** Record).
- Record the temperature and carbon dioxide levels in all windrows (refer to **Appendix 3, Form 11 – Temperature Monitoring Record, Form 12 – Temperature profile** and **Form 13 – Carbon dioxide Percentage Record**).
- Record all starting ingredients used in windrows and any adjustments made to windrows (refer to **Appendix 3, Form 8 – Starting Recipe and Adjustments Performed to Windrows**).
- Record any complaint received in regard odour (refer to **Appendix 3, Form 25 – Complaint**).
- If odour monitoring is conducted use **Form 19 – Odour Monitoring** and if a complaint is received use also use **Form 25 – Complaint Register** (refer to **Appendix 3 – Forms and Checklists**).

Responsibility and Communication:

- It is the responsibility of all Facility Employees engaged in the above activities to ensure that the above controls are met.
- It is the responsibility of the Site Manager to allocate tasks and ensure that control measures are implemented as required to minimise the release of offensive odour.
- The Site Manager is responsible for ensuring that records are collected and maintained.
- The Site Manager is responsible for the prompt notification to the Managing Director when release of offensive odour occurs.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*; and
- *Protection of the Environment Operations (Waste) Regulation 2014*.

Workplace Procedure 12 – Stormwater and Leachate Management

Environmental Commitment:

- To effectively manage stormwater generated at the GRCF so as not to cause environmental harm.

Note: for further detailed information regarding Stormwater and Leachate management, readers are directed to Workplace Procedure 1- Stormwater Management, contained within the Surface and Groundwater Management Plan prepared for the Greenspot Ravensworth Composting facility, dated 3.8.16, Version 7.

Identification of Issues	Potential Impacts
• Chemicals are not stored in a bunded area.	• If a spill occurs, the chemicals contaminate the onsite dams. • If a release occurs, receiving waters are contaminated. • Enforcement action taken by the EPA. • Financial loss. • Requirement to treat or dispose of dam waters. • Requirement to rehabilitated contaminated soils.
• The allowance of gross solids to be transported via stormwater to the stormwater and leachate containment basins.	• Overloading creating anaerobic conditions that if released to the receiving environment could cause environmental harm.
• Damage to a hardstand pad caused by vehicles continually travelling over the pad.	• Damage to the hardstand pad is likely to cause contaminated stormwater to settle in crevices in the pad. • Offensive odour liberation and further damage to the hardstand pad.
• Surface gradients are not maintained such that stormwater runoff is directed as necessary (i.e. stormwater from different areas of the Facility to different dams). • The blocking or obstruction of internal drains.	• Misdirection of stormwater from the various areas of the Facility that could result in undesirable contamination of basins. • Ponding or pooling of stormwater, which may result in increase in the infiltration of stormwater and the redirection of contaminated stormwater. • Ponding and pooling of stormwater possibly creating anaerobic activity. • Overloading of onsite dams creating anaerobic conditions that if released to the receiving environment could cause environmental harm.
• Leachate has not been captured, contained and re-incorporated within the windrows.	• Release of offensive odour creating odour nuisance off site. • Overloading of onsite dams creating anaerobic conditions that if released to the receiving environment could cause environmental harm. • Increased chance in the overloading of one or more of the onsite dams resulting in the release of odour.

Control Measures:

- Ensure that a potential pollutants register is kept of all onsite chemicals, excluding wastes utilised for composting which are to be recorded in accordance with **Workplace Procedure 1 – Waste Receival and Unloading**. The register must be stored in the Site Office and be made available to all staff who handle or manage the chemicals.
- Ensure that Material Safety Data Sheet (MSDS) information is provided with all chemicals. The MSDSs must be kept in the Site Office within the chemical inventory.
- Ensure that all chemicals are stored within the bunded areas nominated.
- Ensure that all incompatible chemicals are stored in separate bunds to minimise the likelihood of an adverse reaction in the event of a spill.
- Ensure that all Facility Employees follow any guidance from the MSDS for the each chemical they handle, including the wearing of appropriate personal protective equipment (PPE).
- Ensure all windrows are constructed such that they run parallel to the stormwater flow paths (i.e. north – south orientation).
- Maintain the hardstand pads, surface gradients (flows paths) and drainage channels such that stormwater flows from the various areas of the Facility are directed as desired.
- Ensure the hardstand pads, drainage channels and dams are functional and integral (particularly after rainfall events) so that movement and storage of stormwater does not result in releases to the receiving environment.
- Inspect all drainage channels regularly to ensure they are maintained free of all obstacles (including waste).
- If the integrity of a hardstand pad, drainage channel or dam is found to be compromised, the Site Manager must be informed immediately. If the integrity of the hardstand pad, drainage channel or dam is found to be compromised, repairs must be conducted immediately, by placing clay in the affected areas and compacting to the required impermeability.
- In the event that ponding or pooling of stormwater does occur, clean-up action must be initiated immediately and surface gradients re-established.
- Any release from bunds should be treated as a spill.
- Ensure that all liquid is sufficiently mixed with absorbent material (i.e. greenwaste bund) and then is incorporated into the composting process.

Record Keeping:

- Record all details about chemicals that are brought on to Site (refer to **PIRMP**).
- Record any repairs or maintenance undertaken to the hardstand pad(s), or internal drains (refer to **Appendix 3, Form 5 – Daily Running Sheet**).
- Record all observations in relation to the performance of the stormwater containment system during and after rainfall events (refer to **Appendix 3, Form 21 – Stormwater Infrastructure Performance Checklist**, including the direction of stormwater to the appropriate dams.
- Record the amount of incidental rainfall that occurs using a rain gauge (refer to **Appendix 3, Form 6 – Daily Weather Conditions**).
- Record details of any release of liquid from the Facility (refer to **Appendix 2, Emergency Procedure 3 – Uncontrolled Release to Waters**, in the event there is a release to the receiving environment).

Responsibility and Communication:

- All Facility Employees must report any release to the receiving environment immediately to the Site Manager for attention and any necessary subsequent action.
- The Site Manager is responsible for ensuring that records are collected and maintained.
- The Site Manager is responsible for the collection and recording of any observations made as to the performance of the stormwater management system.
- The Site Manager is responsible for ensuring any repairs to hardstand pads, drainage channels or dam are completed in a timely manner.

- The Site Manger is responsible for advising the Managing Director about a release to the receiving environment.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*.

Workplace Procedure 13 – Basin Management

Environmental Commitment:

- To ensure that the functioning of the stormwater and leachate detention basins do not result in the release of offensive odour.
- To ensure that the stormwater and leachate containment basins do not release to the receiving environment.

Note: for further detailed information regarding stormwater and leachate detention basin management, readers are directed to Workplace Procedure 2 – Stormwater Detention Basin Management & Workplace Procedure 3 – Stormwater detention Basin Monitoring, contained within the Surface and Groundwater Management Plan prepared for the Greenspot Ravensworth Composting facility, dated 3.8.16, Version 7.

Identification of Issues	Potential Impacts
• Overloading a basins with high strength high Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) substances, both in liquid or solid forms. • Overloading of a basin with excessive amounts of organic matter, such as greenwaste/sawdust.	• A reduction in dissolved oxygen (DO) and resulting in anaerobic conditions, which results in the liberation of offensive odour from the basin. • A reduction in redox potential which results in the liberation of offensive odour.
• Discharging toxic and hazardous liquid wastes to the stormwater and leachate containment basins.	• The killing of beneficial aerobic bacteria and the introduction of toxicants to the composting process.
• Increase in the amount of sediment or sludge at the bottom of the stormwater and leachate containment basins.	• Reduced capacity of the stormwater containment dams.
• The structural integrity of the stormwater and leachate containment basins is compromised.	• Release of contaminated stormwater. • Release of contaminants to unsaturated ground zone, ground water, land and surface water. • Environmental impacts due to the release of contaminated stormwater to the receiving environment.
• Incidental stormwater coming into contact with raw solid or liquid waste (except greenwaste).	• Unnecessary contamination of stormwater resulting in basins becoming overloaded. • Offensive odour release. • Enforcement action taken by the EPA.
• Homogeneous mixing of waste has not occurred and excessive leaching has resulted.	• Increased maintenance of released leachate (i.e. containment, collection and reincorporation). • Unnecessary contamination of stormwater and stormwater flow paths, possibly resulting in the stormwater and leachate containment basins becoming overloaded. • Offensive odour release.

	• Enforcement action taken by the EPA.
• A windrow has had been created using excessive amounts of liquid waste (i.e. > 50% weight for weigh (w/w)) and leaching is occurring.	• Increased maintenance of released leachate (i.e. containment, collection and reincorporation). • Unnecessary contamination of stormwater flow paths and possible release of leachate to stormwater and leachate containment basins. • Possible overloading of the stormwater and leachate containment basins. • Poor composting. • Extended release of offensive odours due to unstable material being turned. • Enforcement action taken by the EPA.

Control Measures:

- All spills must be managed appropriately (refer to **Appendix 2, Emergency Procedure 2 – Spill Management**).
- Ensure only acceptable waste are received at the GRCF and unloaded correctly (refer to **Workplace Procedure 1 – Waste Receival and Unloading**).
- Do not allow high BOD or COD wastes to directly discharge to the stormwater and leachate containment basins.
- Ensure that once the capacity of the stormwater and leachate containment basin is reduced by greater than 30%, excess sediment/sludge is to be removed from the bottom of the basin and the sediment is composted onsite.
- Ensure that all flow paths (surface gradients) are free from debris and waste(s) (refer to **Workplace Procedure 12 – Stormwater Management**).
- Empty the stormwater and leachate containment basin for use as onsite compost pad dust suppression or compost moisture control if required.
- Contain, clean up and reincorporate any bulk leachate emanating from windrows.
- Do not allow solid waste to be discharged to the basins.
- Do not allow raw solid waste (i.e. manures, biosolids, filter presses, putrescible waste) to sit on hardstand pads so that incidental stormwater carries it to the stormwater and leachate containment basins.
- Ensure that the top halves of the stormwater and leachate containment basins are aerobic.
- If rapid oxidation is required above what the aerator can induce, then consideration should be given to introducing ozone or hydrogen peroxide. If initially ozone or hydrogen peroxide cannot be introduced, calcium nitrate should be utilised to increase the redox potential. Given the hazardous nature of hydrogen peroxide, specialist help will be required when introducing it to the dam.
- As an alternative to the above, microbial inoculums or bio-stimulants such as BioAktiv could be added to the basin to suppress odour. The product must be prepared in accordance with the manufacturer's specifications and sprayed over the surface of the affected dam.
- Do not allow pH of the basin's water column to fall below 6.5.
- If pH adjustment is required, introduce dilute solutions to neutralise. This can be determined by performing a jar or bucket test, whereby solutions of sodium bisulphate or dilute solutions of either sulphuric acid or sodium hydroxide can be added to a sample of contaminated water to determine the volume required. However, since both sulphuric acid and sodium hydroxide represent a strong acid and alkali respectively, consideration should be given to the use of weaker acids and bases if a significant adjustment is not required. Contact should be made with a person who is appropriately qualified to make this determination.

- Do not allow toxic or hazardous substance to enter the basins. If a release or discharge occurs to a basin that results in the souring of the dam and hence the liberation of offensive odour, the Site Manager must inform the Managing Director to obtain direction.
- Maintain the perimeter earthen bund and or diversion drain where required around the hardstand pad.
- Ensure that the leachate basins directly servicing a hardstand pad are monitored in-situ for the parameters and at the frequency stated in *Table 1* below. In-situ monitoring should also occur if offensive odour is emanating from a leachate dam or if it has received significant loading.
- In-situ monitoring of pH and DO must also occur following the adjustment of the dams with respect to these parameters.

Table 1: In-situ leachate quality monitoring parameters and frequency

Parameter	Frequency
Dissolved Oxygen (DO) (mg/l)	Every 3 months or in the event of offensive od emanating from an onsite dam or has recei significant loading.
pH (pH units)	
Conductivity (mS/cm)	
Redox Potential (mV)	

- Ensure that the leachate dams are sampled and the samples sent for laboratory analysis for the parameters and at the frequency stated in *Table 2* below.
- Ensure that the laboratory the samples are sent to is NATA accredited.

Table 2: Leachate quality monitoring parameters and frequency

Parameter	Frequency
Biochemical Oxygen Demand (BOD) (mg/l)	Every 6 months.
Conductivity (mS/cm)	
Faecal Coliforms (CFN/ 100 ml)	
Nitrogen (total) (mg/l)	
pH (pH units)	
Phosphorus (total) (mg/l)	
Total Suspended Solids (mg/l)	
Cadmium (µg/l)	
Copper (µg/l)	
Lead (µg/l)	
Nickel (µg/l)	
Selenium (µg/l)	
Zinc (µg/l)	

- Ensure that any basin monitoring results are published on the company website (www.Bio-Recycle.com.au). Clear directions must be visible to the data from the homepage of the website.
- In the event there is a release to receiving waters, **Emergency Procedure 3 - Uncontrolled Release to Waters** must be followed (refer to **Appendix 2**).
- If Bio-Recycle receives a complaint use **Form 25 – Complaint Register** to record all details of the complaint and keep these records updated as the complaint is investigated (refer to **Appendix 3 – Forms and Checklists**).

Record Keeping:

- Record incidental rainfall (refer to **Appendix 3, Form 6 – Daily Weather Conditions**).
- Record all observations in relation to the performance of the stormwater and leachate containment basins (refer to **Appendix 3, Form 21 – Stormwater Infrastructure Performance Checklist**).

- Record any repairs or maintenance undertaken to the basin(s) (refer to **Appendix 3, Form 5 – Daily Running Sheet**).
- Record the DO, EC, pH and redox potential for all dams regularly (at least every 3 months). If DO or pH requires adjustment continue monitoring until the parameter stabilises (refer to **Appendix 3, Form 20 – Insitu Stormwater Monitoring Record**).

Responsibility and Communication:

- It is the responsibility of all Facility Employees engaged in the above activities to ensure that the above controls are met.
- The Site Manager is responsible for ensuring that records are collected and maintained.
- The Site Manager is responsible for ensuring that groundwater and leachate monitoring is performed as required.
- The Site Manager is responsible for ensuring any repairs are carried out promptly.
- The Site Manager is to promptly report to the Managing Director any variance from the control measures that may or do result in environmental harm.
- The Managing Director is to promptly inform the EPA of any variance from the control measures that result in environmental harm.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*.

Workplace Procedure 14 – Rain-Induced Anaerobic Windrows

Environmental Commitment:

- To ensure that windrows are dried when they become saturated so as to minimise a predominance of anaerobic activity.

Identification of Issues	Potential Impacts
• Windrows have become saturated with rainfall and no attention has been given. • Windrows have been overwatered and no attention has been given.	• Windrows have become anaerobic and the subsequent release of offensive odours has created nuisance. • Enforcement action taken by the EPA.
• Windrows block stormwater flow path and stormwater has become trapped behind windrows.	• Windrow bases become anaerobic, releasing offensive odours. • Enforcement action taken by the EPA.
• The hardstand pad is not even and trapped stormwater has created anaerobic conditions at the base of windrows.	• Windrow bases become anaerobic, releasing offensive odours. • Enforcement action taken by the EPA.
• Too much liquid waste has been added to windrows after a rainfall event when absorptive ability has not been present.	• Anaerobic conditions proceed and the release of offensive odour occurs. • Enforcement action taken by the EPA.

Control Measures:

- Apply sawdust to outer edge of saturated windrow to absorb excess liquid.
- Apply sawdust, finished compost or soil (must be suitably absorbent) to contain and mop up any bulk leachate that has been released to hardstand pad to be re-incorporated into windrows (refer to **Workplace Procedure 12 – Stormwater and Leachate Management**).
- Once excess moisture has been absorbed, the opening of windrows can proceed. If excess moisture is experienced, apply sawdust and greenwaste to absorb excess moisture.
- Use Effective Microorganisms (EM) or oxygen stimulating proprietary products, such as BioAktiv, to minimise or eliminate odour.
- Consider the use of windrow covers when rainfall is anticipated.
- After heavy rainfall, aerate saturated windrows.
- Ensure hardstand pad is maintained with an even gradient.
- Do not orientate windrows perpendicular to stormwater flow.
- If Bio-Recycle receives a complaint use **Form 25 – Complaint Investigation** to record all details of the complaint and keep these records updated as the complaint is investigated (refer to **Appendix 3 – Forms and Checklists**).

Note: In some instance windrows will have to be reformed as too much sawdust has been added, which will change the carbon to nitrogen ratio. Adjustments for nitrogen can be performed after reforming. Ensure that windrow is at sufficient moisture content so that the respective maximum moisture contents for the different windrows are not exceeded by the addition of the nitrogen source if it is a liquid.

Record Keeping:

- Record all windrows that need to be dried out (refer to **Appendix 3, Form 10 – Daily Windrow Observation**).

- Record the amount of sawdust, finished compost and/or soil (minor amounts) utilised to mop up leachate (refer to **Appendix 3, Form 5 – Daily Running Sheet**).
- Record all observations such as windrows expelling leachate (refer to **Appendix 3, Form 10 – Daily Windrow Observation**).
- Record the stabilised moisture content. This becomes the starting moisture percentage for the moisture content form (refer to **Appendix 3, Form 9 – Windrow Moisture Content Record**).
- Record the amount of EM or other proprietary product utilised to eliminate or suppress odour (refer to **Appendix 3, Form 8 – Starting Recipe and Adjustments Performed to Windrows**).

Responsibility and Communication:

- All Facility staff members that are engaged in the above mentioned activities are responsible for ensuring control measures are met.
- The Site Manager is responsible for ensuring that attention is given to saturated windrows promptly in order for them to be dried out.
- The Site Manager is responsible for ensuring that records are collected and maintained.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*.

Workplace Procedure 15 – Noise Management

Environmental Commitment:

- To ensure that activities conducted at the GRCF do not cause noise pollution.

Identification of Issues	Potential Impacts
• Onsite equipment with ineffective muffler systems.	• Noise complaint from noise sensitive place. • Enforcement from the EPA.
• Tonal noise from the operation of the trommel or screening plant.	• Dependant on frequency, noise nuisance could occur, which could result in possible noise complaints. • Enforcement from the EPA.
• Impact noise from works performed on site, especially after hours. • Construction of new buildings/facilities or processes.	• Could result in noise levels being emitted greater than background for the area. • Enforcement from the EPA.

Control Measures:

- If noise not ordinarily present is experienced to be emanating from any machinery or equipment that is likely to cause environmental harm at any time, prompt attention should be given to rectifying the noise. The noise should cease until rectification has occurred.
- Ensure that the Daily Machinery Start-up Checklist is completed on a daily basis.
- Unnecessary noise outside of normal operating hours must not occur.
- Unnecessary impact noise must not occur.
- Unusual impulsive or tonal noise must be investigated and avoided wherever possible.
- Ensure that if noise monitoring is requested, a suitably qualified person is engaged to perform and report on the measured noise.
- If noise is occurring at a level that is intrusive to sensitive receptors, consideration will be given to the installation of block walls, shipping containers or dirt mounds to effectively attenuate/absorb sound levels.
- If Bio-Recycle receives a complaint use **Form 25 – Complaint Register** to record all details of the complaint and keep these records updated as the complaint is investigated (refer to **Appendix 3 – Forms and Checklists**).

Record Keeping:

- Daily start up records must be taken (refer to **Appendix 3, Form 7 – Daily Equipment / Machinery Start-Up Checklist**).
- Record any complaint received in regard to noise (refer to **Appendix 3, Form 25 – Complaint Regiter**).
- If noise monitoring is required by the EPA, record all data as per requirements of the *Noise Guide for Local Government* (latest edition published by the NSW EPA).

Responsibility and Communication:

- All Facility staff members that are engaged in the above mentioned activities are responsible for ensuring control measures are met.
- The Site Manager is responsible for ensuring that records are collected and maintained.

- It is the responsibility of the Site Manager to investigate any complaints received regarding noise nuisance and report all findings to the EPA.
- The Site Manager is responsible for the ensuring that the Daily Machinery Start-up Checklist is filled in.
- The Site Manager is responsible for the prompt notification to the Managing Director if noise is released that is likely to cause offensive noise being experienced at a noise sensitive receptor.
- The Managing Director is responsible for the prompt notification to the EPA if noise is released that is likely to cause noise pollution.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*; and
- *Protection of the Environment Operations (Noise Control) Regulation 2008*.

Workplace Procedure 16 – Waste Management

Environmental Commitment:

- To ensure that the generation of waste is managed in a responsible manner to ensure that environmental nuisance or harm does not occur.

Identification of Issues:	**Potential Impacts:**
• Site personnel have allowed food waste to accumulate in amenities bins at the GRCF.	• Vector attraction including vermin, ibis and flies. • Pathogenic bacteria become prevalent and odour is released. • Unsanitised conditions.
• Waste oil from the servicing of plant and equipment has been stored in an unbunded area at the GRCF and a rupture has occurred resulting in the spill of waste oil.	• Release of contaminant to stormwater retention pond. • Land contamination with requirement to clean up at significant cost. • Death of beneficial aerobic bacteria. • Large volume of contaminated water to be removed to a facility that can accept such waste. • Enforcement action taken by the EPA.
• Litter is not contained in onsite waste receptacles and is blown around the site and possibly offsite by the force of the wind.	• Unsightly mess, with entry of litter to stormwater retention ponds. • Offsite movement of litter resulting in compromising the aesthetic value of the receiving environment.
• Used tyres and or unuseful scrap metal from plant or equipment have been stored (long-term) onsite.	• Unsightly mess. • Potential fire hazard.
• Controlled waste has been stored (long-term) onsite.	• Enforcement action taken by the EPA for undertaking an activity that has not been approved.
• Controlled waste generated onsite has not been removed by an approved waste transporter.	• Enforcement action taken by the EPA.
• Waste (all forms) has been buried onsite.	• Environmental harm or nuisance. • Enforcement action taken by the EPA.
• Waste has been placed in drainage channels or in flow paths.	• Interference with drainage of incident rainfall with potential to inhibit traffic movement. • Unnecessary contamination load to receiving waters. • Enforcement action taken by the EPA with requirement to clean-up at significant cost.

• Waste has been burnt onsite.	• Release of toxicants to the air environment. • Reduction in aesthetic quality of area. • Bushfire offsite. • Enforcement action taken by the EPA.

Control Measures:

- Do not burn waste or allow waste to burn.
- Do not bury waste.
- Ensure that all general waste is disposed of general wastes bins/containers.
- Ensure that the general waste bins are emptied when full and the waste disposed of to the local landfill.
- Ensure that controlled waste, such as waste oil and oil filters, are stored in a sealable container in a bunded area.
- Unless necessary, perform services and maintenance of plant and equipment away from areas where contaminants could be carried to containment dams.
- Do not store or dispose of unusable or damaged tyres onsite.
- Do not dispose of waste (in any form) at the GRCF.
- All waste material will be positioned and contained in a manner that prevents any interference with drainage and/or onsite operations.
- Ensure that all spills are managed in accordance with **Emergency Procedure 2 – Spill Management** of **Appendix 2**.
- If a complaint is received use **Form 25 – Complaint Register** of **Appendix 3** to record all details of the complaint and keep records updated as the complaint is investigated.

Record Keeping:

- Ensure that the removal of generated controlled waste is recorded as required.
- Ensure that trackable wastes are indeed tracked.
- In the event of a complaint, record all details of this complaint. (**Refer to Form 25 – Complaint Register**).
- The Site Manager is responsible for the recording of the movement of all waste offsite. (**Refer to Form 5 – Daily Running Sheet**)

Responsibility and Communication:

- It is the responsibility of all employees engaged in the abovementioned activities to ensure that all control measures are carried out.
- The Site Manager is responsible for ensuring that records are collected and maintained.
- The Site Manager is responsible for the prompt notification to the Managing Director if prohibited wastes are brought onto the site.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*; and
- *Protection of the Environment Operations (waste) Regulation 2014*.

Workplace Procedure 17 – Weed Management

Environmental Commitment:

- To ensure that the occurrence of weed and exotic species are identified and controlled to prevent them from causing environmental harm.

Identification of Issues:	**Potential Impacts:**
• The Facility is not inspected at least monthly.	• Weed and exotic species proliferate onsite. • Native species are outcompeted. • Weed and exotic species spread to neighbouring sites. • Enforcement action taken by the DPI or BCC.
• Weed inspections are not undertaken by a suitably qualified and experienced person.	• Unknowingly, weed and exotic species proliferate in vegetated areas. • Native species are outcompeted. • Weed and exotic species spread to neighbouring sites. • Enforcement action taken by the DPI or BCC.
• Chemical weed control is not applied by a licenced operator.	• Surrounding vegetation, including native plant species are harmed. • Herbicide is transferred to stormwater flow paths, creek lines and waterways. • Enforcement action taken by the EPA.
• Herbicide is applied prior to or during rainfall.	• Herbicide is transferred to stormwater flow paths, creek lines and waterways. • Native plant species or regional ecosystems are harmed. • Enforcement action taken by the EPA.

Control Measures:

- Ensure that all site weed inspections are undertaken by a suitably qualified and experienced person.
- Ensure that the suitably qualified person who is to inspect weeds and or apply pesticides is familiar with the NSW DPI publications, titled:-
  - "*Noxious and environmental weed control handbook*", NSW DPI Management Guide, 6th edition ; and
  - WorkCover NSW's Code of Practice for the *Safe Use and Storage of Chemicals (Including Pesticides and Herbicides) in Agriculture*.
- Ensure that persons who utilise pesticides are conversant in the *Work Health and Safety Act 2011* and the Hazardous Chemicals section of the *Work Health and Safety Regulation 2011* which provides legal requirements of suppliers, employers and employees in the workplace for hazardous chemicals management.
- Ensure that the Facility is inspected by a suitably qualified person at least once a year for weed or exotic species.
- Ensure monthly inspections occur by the Site Manager. If there is an increase in the presence of certain weeds, implement management.

- Particular attention must be paid to areas which are identified as high risk for weed occurrence, such as:
  - the main entrance;
  - areas adjacent to receival garden organics; and
  - machinery that is transported to the site.
- Ensure that photographs or samples are taken of suspected or identified weed or exotic species. Once confirmed these can be utilised within monthly onsite inspections.
- Class 1 or 2 declared plant species (as defined within the publication Noxious and Environmental Weed Control Handbook 6th Edition – NSW DPI) must be removed promptly. Areas where these species occur must be regularly inspected and measures taken to remove regrowth.
- Ensure Class 1 or 2 declared plant species do not spread within the Facility or to neighbouring sites.

Weed Removal

- Ensure that noxious weeds are removed and stockpiled in a clear area from adjoining bushland. This stockpile should be removed from the site at a convenient time.
- Ensure that any weed regrowth is removed and disposed of as part of regular vegetation maintenance activities.

Woody Weed Removal

Cut and paint (woody weeds up to 10 cm basal diameter)

- Make a horizontal cut close to the ground using secateurs, loppers or a bush saw; and
- Immediately apply appropriate herbicide to the exposed flat stump surface.
- *Considerations:*
  - Cuts should be horizontal to prevent herbicide from running off the stump, sharp angle cuts are hazardous;
  - Herbicide must be applied immediately before the plant cells close (within 30 seconds) and translocation of herbicide ceases;
  - If plants re-sprout cut and paint the shoots after sufficient re-growth has occurred; and
  - Stem scraping can be more effective on some woody weeds.

Stem Injection

- At the base of the tree drill holes at a 45 degree angle into the sapwood;
- Fill each hole with herbicide immediately; and
- Repeat the process at 5 cm intervals around the tree.

Frilling or Chipping

- At the base of the tree make a cut into the sapwood with a chisel or axe;
- Fill each cut with herbicide immediately; and
- Repeat the process at 5 cm intervals around the tree.
- *Considerations:*
  - Plants should be actively growing and in good health;
  - Deciduous plants should be treated in spring and autumn when leaves are fully formed;
  - For multi-stemmed plants, inject or chip below the lowest branch or treat each stem individually; and
  - Herbicides must be injected immediately before plant cells close (within 30 seconds) and translocation of herbicide ceases.

Small Hand-Pullable Plant Removal

Hand Removal

- Remove any seeds or fruits and carefully place into a bag;
- Grasp stem at ground level, rock plant backwards and forwards to loosen roots and
- pull out; and

- Tap the roots to dislodge any soil, replace disturbed soil and pat down.
- *Considerations:*
    - Leave weeds so roots are not in contact with the soil, e.g. hang in a tree or remove from site.

Vines and Scramblers Removal Techniques

Hand Removal

- Take hold of one runner and pull towards yourself;
- Check points of resistance where fibrous roots grow from the nodes;
- Cut roots with a knife or dig out with a trowel and continue to follow the runner;
- The major root systems need to be removed manually or scrape/cut and painted with herbicide; and
- Any reproductive parts need to be bagged.

Stem Scraping

- Scrape 15 to 30 cm of the stem with a knife to reach the layer below the bark/outer layer; and
- Immediately apply herbicide along the length of the scrape.
- *Considerations:*
    - A maximum of half the stem diameter should be scraped. Do not ringbark;
    - Larger stems should have two scrapes opposite each other; and
    - Vines can be left hanging in trees after treatment.

Weeds with Underground Reproductive Structures Removal Techniques:

Hand Removal of Plants with a Taproot

- Remove and bag seeds or fruits;
- Push a narrow trowel or knife into the ground beside the tap root, carefully loosen the soil and repeat this step around the taproot;
- Grasp the stem at ground level, rock plant backwards and forwards and gently pull removing the plant; and
- Tap the roots to dislodge soil, replace disturbed soil and pat down.

Crowning

- Remove and bag stems with seed or fruit;
- Grasp the leaves or stems together so the base of the plant is visible;
- Insert the knife or lever at an angle close to the crown;
- Cut through all the roots around the crown; and
- Remove and bag the crown.

Herbicide Treatment – Stem Swiping

- Remove any seed or fruit and bag; and
- Using an herbicide applicator, swipe the stems/leaves.
- *Considerations:*
    - Further digging may be required for plants with more than one tuber;
    - Some bulbs may have small bulbils attached or present in the soil around them which need to be removed;
    - It may be quicker and more effective to dig out the weed;
    - Protect native plants and seedlings; and
    - For bulb and corm species the most effective time to apply herbicide is after flowering and before fruit is set.

Use of Herbicides

- Ensure that chemical weed control is undertaken by a licenced operator.

- Ensure that herbicides are not applied prior to or during rainfall. This would reduce herbicide effectiveness and the herbicide could be transferred to stormwater flow paths to creek lines and waterways.
- Ensure that care is taken whilst applying herbicides near drainage lines to avoid excess use due to the sensitivity of the water bodies into which runoff will eventually flow.
- The use of herbicides should be considered when:
  - there are small areas of dense weeds with few or no native plants in close vicinity;
  - there are large areas of weeds; and
  - the weeds are growing too rapidly for physical removal.

Record Keeping:

- Ensure that all observations during site weed inspections are recorded. Photographs or samples of the weed species are to be recorded with observations.
- Ensure that the location of observed weed species is recorded on a site map or by use of GPS.
- Ensure that a record is kept of all weed or exotic species removal, especially chemical weed control. Details of the licenced person undertaking all chemical weed control and the chemicals used must also be recorded.
- Record all pesticide usage as required by the *Pesticides Regulation 2009* within 24 hours (refer to **Form 13 – Pesticide Use Record Keeping Sheet** contained within **Appendix 2**).

Responsibility and Communication:

- It is the responsibility of all employees engaged in the abovementioned activities to ensure that all control measures are carried out.
- The Site Manager is responsible for ensuring that records are collected and maintained.
- The Site Manager is responsible for ensuring that weed inspections of the site, including vegetated areas are carried out as required.
- The Site Manager is responsible for ensuring that a suitably qualified and experienced person is engaged to undertaken site weed inspections.
- The Site Manager is responsible for ensuring that all chemical weed control is undertaken by a licenced operator.

Relevant Legislation:

- *Pesticides Act 1999;*
- *Pesticides Regulation 2009*;
- *Noxious Weeds Act 1993*.

Appendix 2

Emergency Procedures to accompany the Pollution and Incident Response Management Plan

Emergency Procedures

Emergency Procedure 1 – Fire Management

Environmental Commitment:

- To ensure that in the event of a fire starting that all reasonable and practicable measures are taken to minimise or prevent environmental harm, including air, water or land pollution.

Identification of Issues	Potential Impacts
• A person smoking in an unauthorised area has improperly disposed of a cigarette. • Someone has broken into the site and started a fire within combustible material.	• If a fire starts within combustible material. Release of smoke. If not noticed before end of day closing, fire could increase after hours. • A fire ignites causing risks to persons, property and the environment. • Release of particulates, smoke, ash and noxious vapours potentially causing environmental harm. • Workplace health and safety of site personnel may be compromised. • Enforcement action by the EPA.
• Temperatures of windrows have not been regularly monitored and anaerobic activity is prevalent.	• A fire ignites and if this occurs after hours, it may migrate to other windrows or combustibles, potentially causing a significant sized fire and large expense to extinguish and repair damage. • Release of particulate, ash and noxious vapours potentially causing environmental harm. • Workplace health and safety of site personnel may be compromised. • Enforcement action by the EPA.
• Lightning strike onto windrow (particularly on an anaerobic windrow).	• A fire starts in compost windrow. Release of smoke and flame. • If occurred after hours, fire may predominate and jump from windrow to windrow.
• Spontaneous combustion has occurred.	• A fire starts in compost windrow. Release of smoke and flame. • If occurred after hours, fire may predominate and jump from windrow to windrow. • Workplace health and safety of site personnel may be compromised. • Enforcement action by the EPA.
• Allowing windrow to increase in heat excessively without any attempt to cool.	• Eventual spontaneous combustion. If occurs after hours fire could predominate and jump from windrow to windrow. • Release of particulate, ash and noxious vapours. • Workplace health and safety of site personnel may be compromised. • Enforcement action by the EPA.

• Electrical/mechanical fault causes fire.	• Fire destroys property and or equipment • Release of particulate and ash potentially causing environmental harm. • Workplace health and safety of site personnel may be compromised. • Enforcement action by the EPA.
• Fire control equipment such as fire extinguishers, sprinklers have not been maintained and a fire has started in an onsite building.	• Spread of fire to an uncontrollable level. • Explosions of contained flammable or combustible liquids resulting in death. • Extensive loss of property and equipment. • Enforcement action by the EPA.

Control Measures:

- Ensure that all pollution incidents are managed in accordance with Error! Reference source not found..
- Ensure that a strict no smoking policy is enforced onsite when in proximity of any combustible materials. Smoking must only be allowed in designated areas which must be clearly signed and enforced for onsite employees and any visitors.
- Ensure that windrows are constructed and that the temperature of the windrows is monitored in accordance with **Workplace Procedure 5 – Temperature Monitoring** (refer to **Appendix 1 – Workplace Procedures**). If temperature throughout the compost is > 67°C, then sprinkling should be initiated to dissipate heat.
- Ensure all windrows are sufficiently moist. The moisture content of the compost windrows must be kept above 40% weight for weight (w/w). This will retard burning.
- Do not allow windrows to become excessively hot (refer to **Appendix 1, Workplace Procedure 5 – Temperature Monitoring** and **Workplace Procedure 7 – Spontaneous Combustion Prevention**).
- Prevent stockpiled material (e.g. greenwaste) from becoming excessively hot.
- Ensure all stockpiled material or other combustible carbonaceous material is sufficiently moist.
- In the event of a fire within a windrow or greenwaste stockpile the affected windrow/stockpile must first be suppressed with either the use of excessive water and/or dirt. The windrow/stockpile must then be pulled apart. However, if weather conditions are such that pulling apart the windrow/stockpile is likely to ignite other windrows or stockpiles or spread the fire internally or to external property (e.g. dry with moderate/strong winds), the windrow/stockpile must not be broken up. Once weather improves, particularly wind conditions, the windrow/ stockpile can be pulled apart and sequentially inundated with water or soil to effectively extinguish the fire.
- If in the event the fire cannot be extinguished using water or soil, consider the use of fire retardants (seek expert advice from Fire and Rescue NSW before taking action with retardants).
- Once the fire has been extinguished, continue to monitor the affected areas very closely and allow hot material to cool.
- All water collection points need to be checked regularly to determine ability to access.
- Fire extinguishers are to be positioned in readily accessible points so that use in an emergency is not restricted.
- All fire water must be contained onsite.
- Ensure that Facility is secure when no one is present onsite.
- Ensure that all plant, equipment and firefighting equipment is regularly serviced in line with manufacturer's recommendation.

Record Keeping:

- All releases to the air that are likely to cause impact are to be recorded (refer to **PIRMP**).

- Sensitive receptors must be monitored, AT THEIR LOCATION (i.e. offsite) after an incident, to determine if harm is occurring or is likely to occur (refer to **Appendix 3, Form 18 – Dust and Particulate Monitoring** and/or **Form 19 – Odour Monitoring**).
- Record and investigate all complaints received (refer to **Appendix 3, Form 25 – Complaint Register**).
- Record when services/maintenance occurs to electrical or firefighting plant and equipment (refer to **Appendix 3, Form 5 – Daily Running Sheet**).

Responsibility and Communication:

- All Facility Employees that are engaged in the above mentioned activities are responsible for ensuring control measures are met.
- The Site Manager is to promptly report to the Managing Director any variance from the control measures that may result in environmental harm.
- The Managing Director is responsible for advising the EPA of all fire incidents in the first instance.
- The Site Manager is responsible for advising the EPA if the Managing Director cannot be contacted to do so.
- The Site Manager is responsible for controlling the incident unless an administering authority, such as Fire and Rescue NSW or the EPA for example declares it is the "incident controller".
- The Site Manager or relevant Supervisor must carry out any necessary action, as directed by any authorities attending the incident.
- The Site Manager or relevant Supervisor is responsible for ensuring that all employees carry out appropriate action that may be assigned to them.
- The Managing Director is responsible for providing the EPA a written report surrounding the incident, what measures were taken to minimise or prevent environmental harm and what measure are to be taken to minimise or prevent a recurrence.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*.

Emergency Procedure 2 – Spill Management	
Environmental Commitment: • To ensure that prompt attention is given to cleaning up spills, to minimise the likelihood of causing environmental harm, including air, water or land pollution.	
Identification of Issues	**Potential Impacts**
• Failure to contain spilled substance.	• Increase in the generation of contaminated stormwater. • Unnecessary increase in the level of contamination of onsite basins. • Release of contaminants to the air, water and land environments. • Enforcement action by the EPA.
• Stormwater runoff is allowed to come into contact with spill substance resulting in generation of contaminated stormwater.	• Increase in the generation of contaminated stormwater. • Increase in the level of contamination of onsite basins. • Release of contaminants to the air, water and land environments. • Enforcement action by the EPA.
• Waste has been spilt such that it is impeding stormwater flow paths.	• Stormwater can no longer traverse along flow path into associated containment dams, resulting in ponding and pooling and indiscriminate flow paths. • Release of contaminants to the air, water and land environments. • Increase in the level of contamination of onsite basins. • Enforcement action by the EPA.
• Wastes have been spilt and allowed to directly or indirectly enter onsite basins.	• Waste entering containment dams could cause the dams to turn anaerobic. • Generation and release of offensive odour. • Unnecessary contamination of the onsite containment basin. • Reduce storage capacity of the basins. • If contaminants release to basin resulted in an overtopped event, the extent of contamination would be greater and require more resources to clean up. • Enforcement action by the EPA.
• Waste(s) have been spilt and allowed to sit and/or spread.	• Odour nuisance due to increased surface area whereby mass of released volatile odours has increased. • Release of contaminants to unsaturated ground zone, ground water, land and surface water. • Enforcement action by the EPA.

Control Measures:

- Ensure that all pollution incidents are managed in accordance with the attached **PIRMP**.
- Ensure that all wastes accepted are unloaded and managed correctly (refer to **Appendix 1, Workplace Procedure 1 – Waste Receival and Unloading**).
- Ensure all spillage is contained, collected and removed promptly.
- Ensure that all FEL operators abide by the instructions to minimise spills set forth in **Workplace Procedure 2 - Open Windrow Construction & Maintenance**.
- Always ensure sufficient quantities of spill kit materials are readily available to Facility Employees to contain and recover spills.

Cleaning Up Spills of Solid Waste

- Only dry methods of clean-up will be utilised.
- Spilt material should be contained as necessary so as it does not spread.
- The following is a typical list of materials and equipment to be utilised in the event of a spill:
  - shovels;
  - yard brooms;
  - kitty litter or sawdust;
  - booms (on-ground);
  - drain covers and plugs;
  - front end loader (FEL);
  - screens/temporary fencing;
  - portable bin; and/or
  - a wheelbarrow(s).

Spills to Onsite Stormwater and Leachate Containment Basins

- Test for pH, dissolved oxygen (DO), electrical conductivity (EC) and redox potential.
- If pH adjustment is required, introduce dilute solutions to neutralise. This can be determined by performing a jar or bucket test, whereby solutions of sodium bisulphate or dilute solutions of either sulphuric acid or sodium hydroxide can be added to a sample of contaminated water to determine the volume required. **However, since both sulphuric acid and sodium hydroxide represent a strong acid and alkali respectively, consideration should be given to the use of weaker acids and bases if a significant adjustment is not required. Contact should be made with a person who is appropriately qualified to make this determination.**
- Ensure that an aerator is operating to efficiently aerate contaminated water if required.
- If rapid oxidation is required above what the aerator can induce, then consideration should be given to introducing ozone or hydrogen peroxide. If initially ozone or hydrogen peroxide cannot be introduced, calcium nitrate should be utilised to increase the redox potential. **Given the hazardous nature of hydrogen peroxide, specialist help will be required when introducing it to the dam.**
- As an alternative to the above, ensure microbial inoculums are regularly dosed to the leachate containment system to suppress odour.
- Continue monitoring pH, DO, EC and Redox after addition of agents.

Record Keeping:

- Record all volumes spilt and actions taken to remedy the spill (refer to **Incident Report and Investigation Form** and **Hazard Report Form** of attached **PIRMP**).
- If a release to on site containment dams occurs, record parameters required (refer to **Appendix 3, Form 20 – Insitu Stormwater Monitoring Record**).
- Record any adjustments made to dams to control DO, pH or odour, including the use of an aerator (refer to **Appendix 3, Form 5 – Daily Running Sheet**).

Responsibility and Communication:

- All Facility Employees that are engaged in the abovementioned activities are responsible for ensuring control measures are met.
- The Site Manager is responsible for informing the Managing Director immediately upon becoming aware of a spill.
- The Site Manager is responsible for ensuring that the appropriate procedures are adopted and implemented in a timely manner in the event of a spill (i.e. monitoring, reporting and repair).
- All physical observations regarding the lack of bund integrity must be brought to the attention of the Site Manager.
- The Site Manager is responsible for initiating action to ensure the bund is effectively repaired.
- The Site Manager is responsible for advising the administering authority about a release to the receiving environment.
- The Managing Director is responsible for notifying the EPA of all spills, in the first instance that may result or are likely to result in environmental harm. The Site Manager is responsible if the Managing Director is unable to do so.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997*.

Emergency Procedure 3 – Emergency Leachate Release

Environmental Commitment:

- To ensure that any unanticipated emergency releases of leachate to the receiving environment are minimised and/or prevented from causing environmental harm.

Note: Anticipated Emergency stormwater releases are permitted to occur following rainfall in excess of a 1 in 25 year 24 hour AEP rainfall event.

Identification of Issues:	***Potential Impacts:***
• A lack of observation has resulted in poor maintenance of the basin whereby water is released as a result of a crack or gap in the basin wall or spillway.	• Leachate is released as a result of a crack or gap in the basin. • Contravention of a permit condition & possible enforcement action by EPA.
• Rainfall results in a release from detention basin when it should not have (i.e. rainfall event is < 1 in 25 year 24 hour rainfall event) due to an inadequate containment storage volume being afforded.	• Unknown quality of water being released. • Contravention of a permit condition & possible enforcement action by EPA.
• Leachate releases from the detention basin prior to the monitoring and sampling of the water being released.	• Unknown quality of water released with an inability to quantify harm (if any). Wilful contravention of a permit condition & enforcement action by EPA.
• The detention basin has not been maintained correctly (i.e. excess sediment removed) and the containment capacity is reduced below the required volume.	• The containment capacity provided within onsite basins is insufficient to contain the volume of leachate generated over the disturbed area of the site up to and including a 1 in 25 year 24 hour rainfall event. • Wilful non-compliance of permit conditions and enforcement action by EPA.
• The site has not been managed correctly resulting in significant erosion occurring. Minimal time is available for treatment and a release of turbid water occurs.	• Excessive contamination of onsite basin(s) and stormwaters. • Increased maintenance and associated costs of onsite basins. • Release of excessively turbid waters. • Contravention of a permit conditions & possible enforcement action by EPA.

Control Measures:

- **Refer to onsite PIRMP for further information surrounding emergency management.**
- Ensure all stormwater is managed correctly (refer to **Workplace Procedure 1 – Leachate Management**).
- Ensure that the detention basin is managed correctly (refer to **Workplace Procedure 2 – Leachate Detention Basin Management**).

- Ensure excess sediment is removed from the sedimentation and detention basin as required to ensure leachate containment capacity is maintained.
- Ensure all leachate management infrastructure required is installed as required (refer to **Workplace Procedures 1 and 2**).
- Ensure all leachate management infrastructure is maintained correctly (refer to **Workplace Procedures 1 and 2**).
- As the disturbed area of the site increases ensure progressive rehabilitation occurs.
- If increases in the disturbed area of the site occur, ensure the containment capacity of onsite basins also increases in line with the increased area of disturbance. Ensure that containment capacity exists on site for the volume of leachate that will be generated over the disturbed area of the site up to and including a 1 in 25 year 24 hour rainfall event.
- Ensure that as the activity progresses significant erosion and generation of excessively turbid stormwater is avoided.
- In the event that an emergency release to the receiving environment is occurring the Site Manager must be notified that this is occurring.
- In the event of an anticipated emergency release contained stormwater must be monitored for the insitu parameters listed in *Table 1* below.

Table 1:

Water Quality Parameter	Monitoring Frequency
Dissolved Oxygen (DO)	As required upon an emergency release.
pH (field measured)	
Electrical Conductivity (EC)	
Redox Potential (Redox)	

- In the event of an anticipated emergency release a sample should be obtained so that if analysis for the parameters listed in *Table 2* below is required, it can be.

Table 2:

Analyte	Monitoring Frequency
BOD	As required upon an emergency release..
COD	
Ammonia	
Nitrate	
Total Phosphorous	
Total Nitrogen	
Zinc	
Copper	
Mercury	
Selenium	

Lead	
Nickel	
Suspended Solids	

- In the event of an anticipated emergency release the Site Manager is responsible for ensuring that appropriate actions are taken to safely obtain a sample that is representative of the release.
- The Site Manager is responsible for ensuring that steps are taken promptly to minimise any uncontrolled releases to the receiving environment. Such measures may include the prompt plugging and repair of bund walls, dam wall or spill way or if observation determines prompt attention is required, removal of sediment within in sedimentation and detention basins or redirection of stormwater to minimise erosion and sediment transport.

Record Keeping:

- Record all estimated volumes of any anticipated emergency release (refer to **Appendix 2**, **Form 4 – Emergency Release Notification Form**).
- In the event of an emergency release from the detention dam obtain readings for dissolved oxygen (DO), electrical conductivity (EC), redox potential and pH from the dam. Use **Form 4 – Emergency Release Notification Form (**refer to **Appendix 2**) for recording data.
- Note any observations made when performing monitoring (refer to **Appendix 2**, **Form 4 – Emergency Release Notification Form**).
- Use **Form 4 – Emergency Release Notification Form (**refer to **Appendix 2**) to report information about the release to EPA.

Responsibility and Communication:

- It is the responsibility of onsite employees to report any variance from the control measures stated above to the Site Manager.
- All emergency releases that have the potential to cause material environmental harm must be brought to the attention of EPA by telephone as soon as practicable after becoming aware that there has been an emergency release.
- The Site Manager is responsible for notifying the EPA immediately upon becoming aware that an emergency release has occurred or is likely to occur which has the potential to cause material environmental harm.
- The Site Manager is responsible for notifying EPA in the first instance; however, in the absence of the Site Manager, an onsite employee must do so.

Relevant Legislation:

- *Protection of the Environment Operations Act 1997.*

Appendix 3

Forms and Checklists

Please note that the following forms are indicative only, and merely outline the information that is required to be recorded by Bio-Recycle and provided to the administering authority, as and when required. This information may be recorded by other means as long as the pertinent information is captured.

Forms

Form 1 – Plant Health Assurance Certificate (Example Only)

NSW GOVERNMENT Department of Primary Industries

ORIGINAL (Yellow) – Consignment Copy
DUPLICATE (White) – Business Copy

Certificate Number	

Business Specific Information*
Dispatch Date: / / Ref No:
Arrival Date: / / PO No:
* These items display business specific information entered at the discretion of the consignor. They do not represent any part of the certifying conditions of the produce.

Plant Health Assurance Certificate

All accreditation details must be completed. Please print clearly and initial any alterations

Consignment Details

Consignor	
Name	
Address	
Consignee	
Name	
Address	
Reconsigned to: (Splitting consignments or reconsigning whole consignments)	
Name	
Address	

Certification Details

IP Number	Facility Number	Procedure
N		

Accredited Business that prepared produce (As IP Number above)

Name	
Address	

Grower(s) (If more than one grower – attach list)

Name	
Address	

For ICA23 each source property must have current Property/Approval)

Number of Packages	Type of Packages (e.g. trays, cartons)	Type of Produce	Brand Name or identifying marks (As marked on packages)	Date Code (As marked on packages)	Authorisation for reconsignment

Treatment Details

Treatment Date	Treatment Chemical (Active Ingredient), Concentration, Duration, Temperature
/ /	
/ /	
/ /	
Additional Certification (Apply ICA Stamp here)	

Declaration

I, an Authorised Signatory of the accredited business that prepared the plants or plant produce described above, hereby declare that the plants or plant produce have been prepared in the business's approved facilities in accordance with the business's Interstate Certification Assurance arrangement and that the details shown above are true and correct in every particular.

Authorised Signatory's Name (Please print)	Signature	Date
		/ /

Form 2 – Waste Receival Record

Load ID # - type/date/transporter/ initials of staff member receiving waste	**Does waste description provided by transporter match the waste?** Including estimated vol. and composition of waste.	**Volume of incoming waste** m^3 or litres	**Is waste releasing runoff/leachate?**		**Is waste releasing offensive odour?**		**Is waste releasing heat or other emissions?** Describe emissions, e.g. fine dust.		**Are there any disease vector attractants?** Describe vectors e.g. flies, rodents etc.	
	(y/n)		**(y/n)**	**Corrective Action**	**(y/n)**	**Corrective Action**	**(y/n)**	**Corrective Action**	**(y/n)**	**Corrective Action**
	(y/n)		**(y/n)**	**Corrective Action**	**(y/n)**	**Corrective Action**	**(y/n)**	**Corrective Action**	**(y/n)**	**Corrective Action**
	(y/n)		**(y/n)**	**Corrective Action**	**(y/n)**	**Corrective Action**	**(y/n)**	**Corrective Action**	**(y/n)**	**Corrective Action**
	(y/n)		**(y/n)**	**Corrective Action**	**(y/n)**	**Corrective Action**	**(y/n)**	**Corrective Action**	**(y/n)**	**Corrective Action**
*Note: For loads of Phylloxera host plant material ensure that **Form 3 – Record of Receipt of Host Plant Material** is completed.*										

Form 3 – Record of Receipt of Host Plant Material

Business Name: Bio-Recycle Pty Ltd **N**					**Record Number:**		
PHAC Number(s)	**Date of Receipt**	**Type of host plant material or waste**	**Quantity** (m^3)	**Name of Receiver**	**Name of Authorised Signatory**	**Signature of Authorised Signatory**

Form 4 – Contaminant Characteristics Report

Item	Yes/No
• What is the approximate volume of the contaminated waste (e.g. how many wheelie bin loads)?	
• Is there a definable odour to the contaminant? If so, describe the smell:	
• Is any of the waste putrefying or badly decomposed?	
• Is there noxious or offensive odour being released from the waste?	
• Are there any obvious reactions happening to the waste? Is it smoking or steaming? Is there a lot of heat present? Is there any sound being produced e.g. "fizzing", describe what you see or hear:	
• What is the name of the transport company and name and contact details of driver, date and time of delivery and unloading of waste:	

Form 5 – Daily Running Sheet

Date	Time	Initials	Description of Daily Events Include extraordinary events such as non-compliances or emergencies, as well as the removal of all waste from the Facility and necessary information (transporter, volumes, etc.). This should link with information contained in other forms.

Form 6 – Daily Weather Conditions

Date and initials	Description of Weather Incorporate any changes throughout the working day, a weather vane measuring wind direction and a rainfall gauge should be installed on site. Include previous night-time conditions, e.g. overnight rainfall should be measured and recorded.			
	Rainfall (mm)	Wind direction and general weather description and location when observed		
		Morning	Noon	Afternoon

Form 7 – Daily Equipment / Machinery Start-Up Checklist

Date and initial	Item	Any change in apparent noise output. If so what?	Any broken or loose fitting items	Next service or calibration date	Any fuel or liquid leakage

Form 8 – Starting Recipe and Adjustments Performed to Windrows

Windrow ID # and date/time/initials	**Amount of greenwaste and/or sawdust added** **Approx. weight in kg/tonnes**	**Amount of liquid waste added –** Note the source and type of liquid waste. **Approx. volume in litres**	**Amount of solid waste added –** Note the source and type of solid waste. **Approx. weight in kg/tonnes**	**Amount of any further additions -** Note the source and type and volume. **Approx. weight in kg/tonnes (solids) or volume in litres (liquids)**

Form 9 – Windrow Moisture Content Record

Windrow ID # and date/time/initials	Initial Moisture Content %	Added Moisture % and date of addition	Added Moisture% and date of addition	Added Moisture% and date of addition	Added Moisture% and date of addition	Added Moisture% and date of addition

Form 10 – Daily Windrow Observation

Windrow ID # and date/time/initials	Is compost releasing leachate?		Is compost releasing offensive odour?		Is compost releasing smoke / smouldering?		Are any pests/vectors attracted to compost? Describe them: flies, birds, rodents.	
	(y/n)	Corrective Action	(y/n)	Corrective Action	(y/n)	Corrective Action	(y/n)	Corrective Action
	(y/n)	Corrective Action	(y/n)	Corrective Action	(y/n)	Corrective Action	(y/n)	Corrective Action
	(y/n)	Corrective Action	(y/n)	Corrective Action	(y/n)	Corrective Action	(y/n)	Corrective Action
	(y/n)	Corrective Action	(y/n)	Corrective Action	(y/n)	Corrective Action	(y/n)	Corrective Action
	(y/n)	Corrective Action	(y/n)	Corrective Action	(y/n)	Corrective Action	(y/n)	Corrective Action

Form 11 – Temperature Monitoring Record

Windrow ID #:..... **Date windrow formed: .....**

Week	Date	Temperature (°C) *Note: Temperature taken at 3 equidistant depths in the windrow at each point*												Average Temperature (°C)
		Point 1			Point 2			Point 3			Point 4			
1														
2														
3														
4														

Form 11 – Temperature Monitoring Record

Week	Date	Temperature (°C) *Note: Temperature taken at 3 equidistant depths in the windrow at each point*												Average Temperature (°C)
		Point 1			Point 2			Point 3			Point 4			
5														
6														
7														
8														

Form 12 – Temperature Profile

Windrow ID #: ..... **Date windrow formed: .....**

Temperature (°C)	Week 1							Week 2							Week 3							Week 4							Week 5						
	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
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24																																			

Note: Record when windrows are turned by inputting a 'T' at the temperature that was returned prior to turning and on the relevant day that the turning occurs.

Temperature (°C)	Week 6							Week 7							Week 8							Week 9							Week 10						
	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
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38																																			
36																																			
34																																			
32																																			
30																																			
28																																			
26																																			
24																																			

Note: Record when windrows are turned by inputting a 'T' at the temperature that was returned prior to turning and on the relevant day that the turning occurs.

Form 13 – Carbon Dioxide Percentage Record

Windrow ID #: ..... **Date windrow formed: .....**

CO_2 (%)	Week 1							Week 2							Week 3							Week 4							Week 5						
	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
>20																																			
20%																																			
18%																																			
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14%																																			
12%																																			
10%																																			
8%																																			
6%																																			
4%																																			
2%																																			
0%																																			

CO_2 (%)	Week 6							Week 7							Week 8							Week 9							Week 10						
	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
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Form 14 – Treatment Record

Business Name: Bio-Recycle Pty Ltd **N**					**Record Number:**		
Date	**Treatment Method** *For example:3 turns once 55°C for 3 days*	**Type of host plant material**	**Treatment duration**	**Treatment Temperature** (°C)	**Name of Process Controller**	**Signature of Process Controller**

Form 15 – Quality Limits Sampling Checklist

Item	Yes/No
• Have five individual grab samples been collected per 500 dry solid tonnes of finished compost, soil conditioner or vermicompost manufactured from biosolids?	
• Was each sample obtained from locations that were equally spaced apart, along the length or around the circumference of the finished compost, soil conditioner or vermicompost stockpile?	
• Were they each obtained from equidistant points at the equally spaced locations from the perimeter of the stockpile to within the finished compost windrow?	
• Did the five individual grab samples make up the 1 composite sample?	

Form 16 – Equipment Inspection Record

Business Name: Bio-Recycle Pty Ltd				**IP Number:** N						
Make	**Model**	**Serial Number**	**Inspection Date**	**Details of Inspection**				**Accepted (Y / N)**	**Name of Process Controller**	**Signature of Process Controller**

Form 17 – Dust Suppression Record

Date and Initials	Area Covered	Duration of Dust Suppression	Equipment Used

Form 18 – Dust and Particulate Monitoring

(Page 1 of 2)

Date, Time and Initials	**Wind Direction**	**Wind Speed**	**Location of Dust Monitoring** (including whether upwind or downwind)	**Dust or Particulates Observed Migrating Beyond Boundary** (Yes/No and if yes, describe the extent)
Monday				
Tuesday				
Wednesday				
Thursday				
Friday				
Saturday				
Sunday				

Form 18 – Dust and Particulate Monitoring

(Page 2 of 2)

Beaufort scale number	Descriptive term	Units (km/h)	Description on Land
0	Calm	0	Smoke rises vertically.
1-3	Light winds	19 or less	Wind felt on face; leaves rustle; ordinary vanes moved by wind.
4	Moderate winds	20 - 29	Raises dust and loose paper; small branches are moved.
5	Fresh winds	30 - 39	Small trees in leaf begin to sway; crested wavelets form on inland waters.
6	Strong winds	40 - 50	Large branches in motion; whistling heard in telephone wires; umbrellas used with difficulty.
7	Near gale	51 - 62	Whole trees in motion; inconvenience felt when walking against wind.
8	Gale	63 - 75	Twigs break off trees; progress generally impeded.
9	Strong gale	76 - 87	Slight structural damage occurs -roofing dislodged; larger branches break off.
10	Storm	88 - 102	Seldom experienced inland; trees uprooted; considerable structural damage.
11	Violent storm	103 -117	Very rarely experienced - widespread damage.
12+	Hurricane	118 or more	

Form 19 – Odour Monitoring

Date, time and initials	Location	Intensity (1- 6)	Characteristics	Hedonic Tone	Duration (Seconds / Minutes)
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					
Saturday					

Intensity: 0 = not perceptible, 1 = very weak, 2 = weak, 3 = distinct, 4 = strong, 5 = very strong, and 6 = extremely strong.

Characteristics: The character of the odour e.g. describing the odour as similar to rotten eggs or putrescible waste etc.

Hedonic tone: The degree to which the odour is perceived as pleasant or unpleasant rated on a scale of -50 to +50 see below (T. Hummer *et al* (1996):

-50	-40	-30	-20	-10	0	+10	+20	+30	+40	+50
Absolutely unpleasant		Unpleasant	Slightly unpleasant		Neutral		Slightly pleasant	Pleasant		Absolutely pleasant

Form 20 – Insitu Stormwater Monitoring Record

Date and Initials	Dissolved oxygen (DO) ppm or mg/L	Electrical Conductivity (EC) µs/cm	Redox Potential	pH
	Corrective action – if so what?	**Corrective action – if so what?**	**Corrective action – if so what?**	**Corrective action – if so what?**
	Corrective action – if so what?	**Corrective action – if so what?**	**Corrective action – if so what?**	**Corrective action – if so what?**
	Corrective action – if so what?	**Corrective action – if so what?**	**Corrective action – if so what?**	**Corrective action – if so what?**
	Corrective action – if so what?	**Corrective action – if so what?**	**Corrective action – if so what?**	**Corrective action – if so what?**
	Corrective action – if so what?	**Corrective action – if so what?**	**Corrective action – if so what?**	**Corrective action – if so what?**

Form 21 – Stormwater Infrastructure Performance Checklist

Refer to Form 2 – Stormwater Performance Checklist contained within the SGWMP.

Form 22 – Calibration Record

Name of Person or Organisation Calibrating Equipment	Time and Date	Make and Model of Equipment	Temperature Reading (°C)	Corrective Action

Form 23 – Training and Competency Register

TRAINING AND COMPETENCY REGISTER

BetterGROW

Current at:

EMPLOYEE NAME	Company Induction	Pollution Incident Response Management Plan	Site Orientation & Induction	Front End Loader	Forklift	Bobcat	Heavy Combination	Excavator	First aid Certificate	WorkCover OHS Construction	Crane Elevated Work Platform	Light Rigid	Tractor/ Plough						Other Items Not listed
	BG	BG	BG	EX	EX	EX	EX	EX	EX	EX	EX	EX							
REQUIRED FOR THIS JOB (Y/N)	Y	Y	Y	N	N	N	N	N	N	N	N								
Neil Schembri	Y	Y	Y	C															
Susan Hogarth	Y	Y	Y																
Kim Hogarth	Y	Y	Y																
Steve Ryke (BGLR)	Y	Y	Y																
Neale Hogarth	Y	Y	Y		Y	Y						LR							
Craig Hogarth	Y	Y	Y	119266	Y														
																			Asbestos Lic No 40654

Key: BG Completed by Bettergrow, EX External Training Private Company, C Competent, Dates shown are expiration dates.

SP11/Form TCR-01 page 1 of 1 SP-12 Rev0/February 2013

Form 24 – Continuous Improvement

(Page 1 of 2)

See reverse for instructions on how to complete.

DATE:	
IDENTIFIED BY:	**IDENTIFIED TO:**
ACTIVITY:	
ISSUE:	
RATIONALE:	
PROPOSED RESOLUTION:	
SUPERVISOR'S COMMENTS:	
FOLLOW-UP/RESOLUTION (*please date*):	
SIGNATURE OF IDENTIFIER	**SIGNATURE OF SITE MANAGER**
DATE ISSUE RESOLVED:	

Copies:

- Original to staff member who lodged form;
- Copy to Supervisor for personnel file; and
- Copy to be brought forward as agenda item for staff meetings.

Form 24 – Continuous Improvement

DATE: Date that staff member completed form.	
IDENTIFIED BY: Name of staff member.	**IDENTIFIED TO:** Name of Supervisor or Manager who the issue was identified to – this employee will be responsible for bringing this to weekly/monthly meeting as part of the agenda.
ACTIVITY: Describe activity/work area.	
ISSUE: Staff member succinctly identifies issue (what, how, when, who and where), giving sufficient details of the concern.	
RATIONALE: Staff member identifies why he/she feels it is an issue. Provides some detail regarding history, implications and consequences.	
PROPOSED RESOLUTION: Staff member identifies his/her suggestions to resolve this issue. Provides details regarding benefits, costs, implications, time lines, responsibility and accountability to enact recommendation.	
SUPERVISOR'S COMMENTS: Supervisor can make comments to support or endorse idea, or may note other opinions. May provide details regarding benefits, costs, implications, time lines, responsibility and accountability to enact recommendation.	
FOLLOW-UP/RESOLUTION (*please date*): Leadership team reviews the issue and resolution. May direct issue and recommendations to other work areas (i.e. building facilities, OH&S, HR, Admin) who would then be responsible to follow up with investigation of issue and possible changes). In this area the leadership or those assigned would respond to issue, noting action taken, or not taken and rationale.	
SIGNATURE OF IDENTIFIER	**SIGNATURE OF SITE MANAGER**
DATE ISSUE RESOLVED: There should be a set timeline to respond to the issue.	

Copies:

- Original to staff member who lodged form;
- Copy to supervisor for personnel file; and
- Copy to be brought forward as agenda item for staff meetings.

Form 25 – Complaint Register

BetterGROW

Complaints Register Management System Manual Clause 5.18 Ravensworth Void Rehabilitation

Month	Person Name	Contact Number	Date of Complaint	Date & Time	Problem or issue
Jan 2015	Nil				Not active on site Ravensworth
Feb 2015	Nil				Not active on site Ravensworth
March 2015	Nil				Not active on site Ravensworth
April 2015	Nil				Not active on site Ravensworth
May 2015					
June 2015					
July 2015					
Aug 2015					
Sept 2015					
Oct 2015					
Nov 2015					
Dec 2015					
Jan 2016					
Feb 2016					
March 2016					
April 2016					
May 2016					

- Fill out by hand keep copy on view with PRIMPS
- Complaint's to be followed up with report and action taken to fix problem that caused complaint.
- If necessary fill out NCR Non-conformance repot and corrective action SP07 and SP08 fill and log
- Attach complaint's and corrective action to the back of this form

Form 26 – New Incoming Feedstock Selection and Evaluation – Questions for the waste generator

Name of waste generator	
Name of contact person and contact details	
Type of waste feedstock	
What are the chemical components of the waste?	
Are you able to provide a Material Safety Data Sheet (MSDS) for the waste?	
Have you read the 'Waste Acceptance Criteria' for the Roma Composting Facility? If yes, is there any reason you believe we might not be able to accept this waste?	
Is the waste classified as a 'Trackable Waste'? If yes, please provide the waste tracking code. *Note: refer to Schedule 1 of the Environmental Protection (Waste Management) Regulation 2000.*	
Do you have any special measures, which are implemented to handle or manage the waste?	
Are there any other processes at your facility which could potentially contaminate the waste? If yes, please provide detail of the potential contaminant(s).	
Does the waste contain any large objects that would prevent it from being effectively mixed?	
Is the waste putrescible or does it have the ability to putrefy?	

Form 27 – Contacts

CONTACTS

BetterGROW

Bettergrow Office	02 4587 7852
Bettergrow Fax	02 4577 2603
Address	48 Industry Rd, VINEYARD NSW 2765
Fire/Police/Ambulance	000
Work Cover	13 10 50
Windsor Council	02 4560 4444
EPA	131 555
Ministry of Health	02 9391 9000
Work Cover	13 10 50
Neale Hogarth	0498 692443
Neil Schembri	0419 636 088
Susan Hogarth	0418 247 805
Craig Hogarth	0427 210 070

Review date 10/11/14 SP12

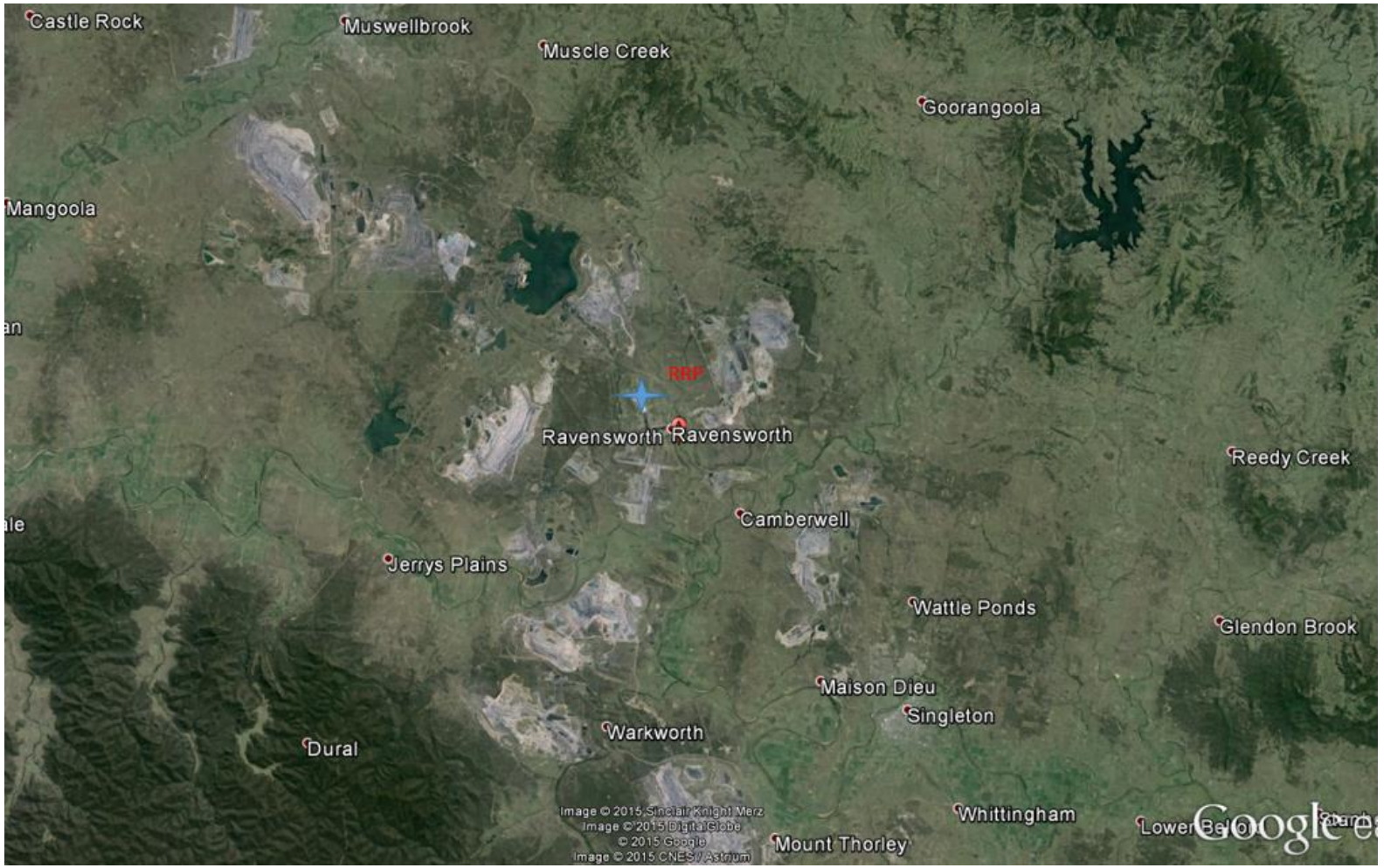
APRIL 2013

Appendix 4

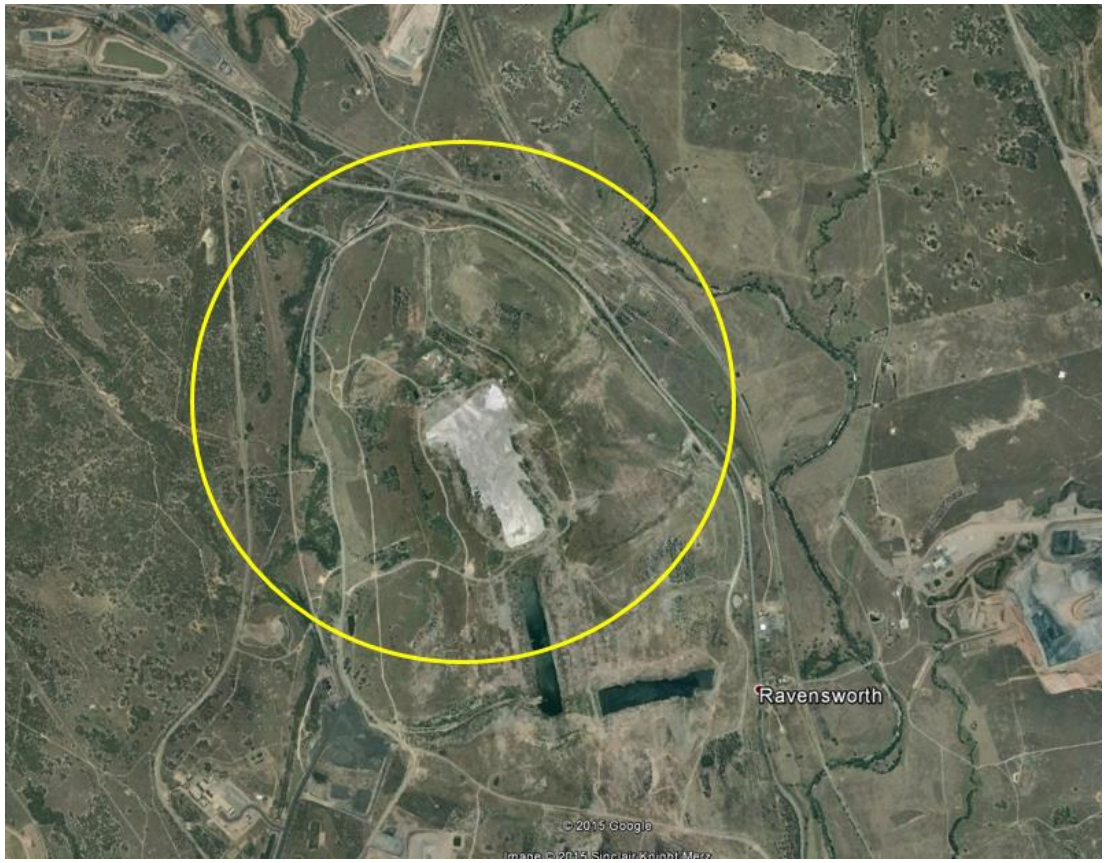
Figures

Figures

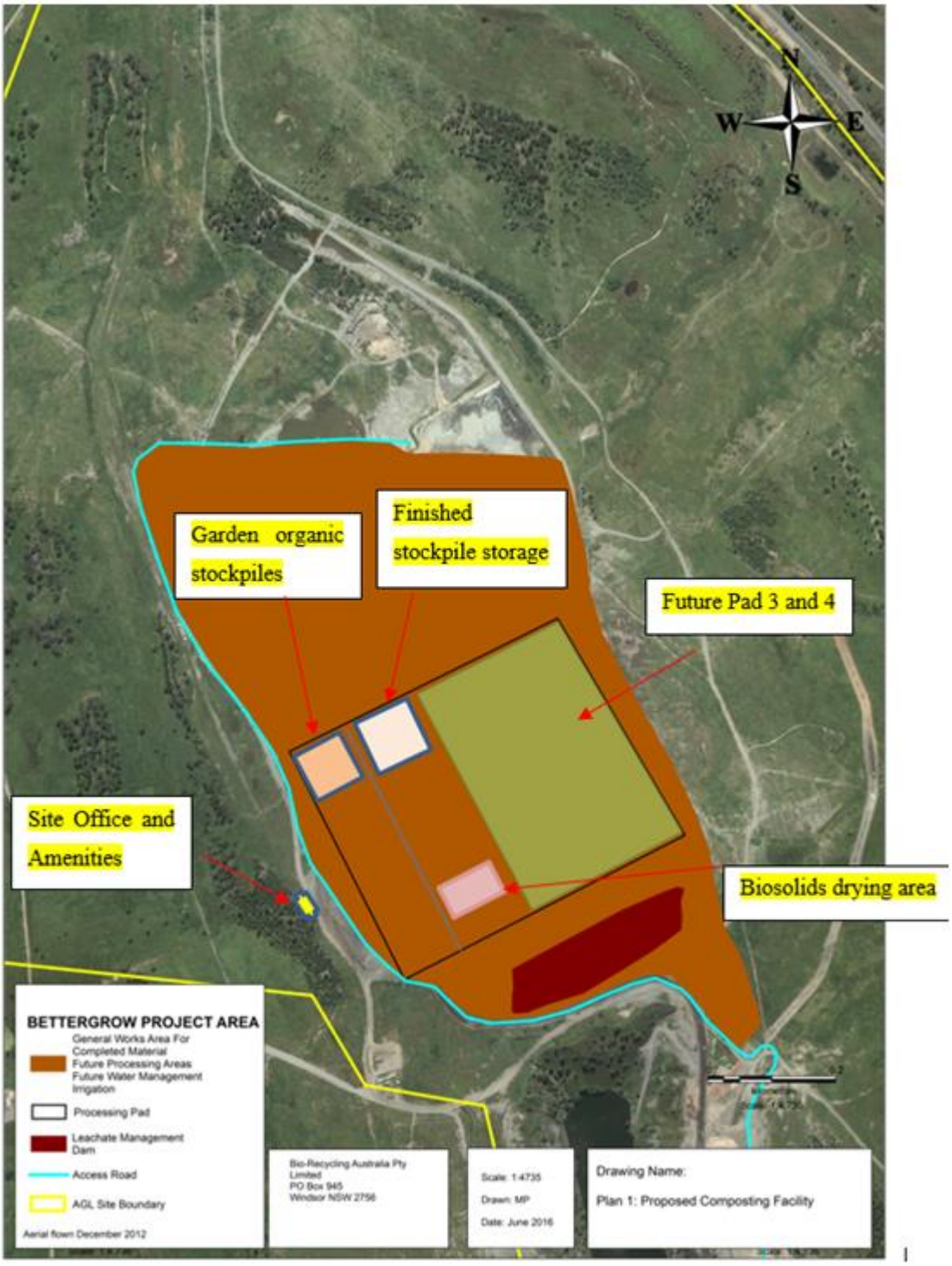
Appendix 4 – Figure 1: Location of the GRCF



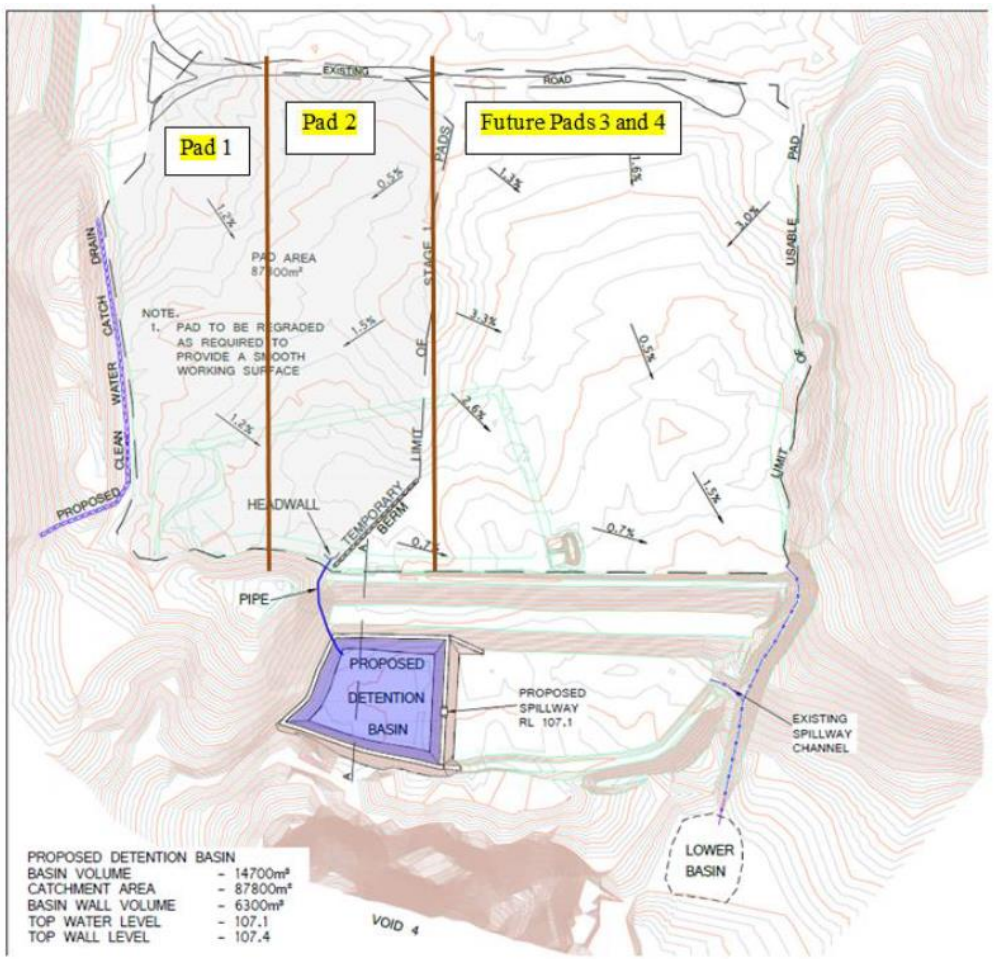
Appendix 4 – Figure 2: Sensitive industries exclusion zone (1.5 km) centred on the middle of site



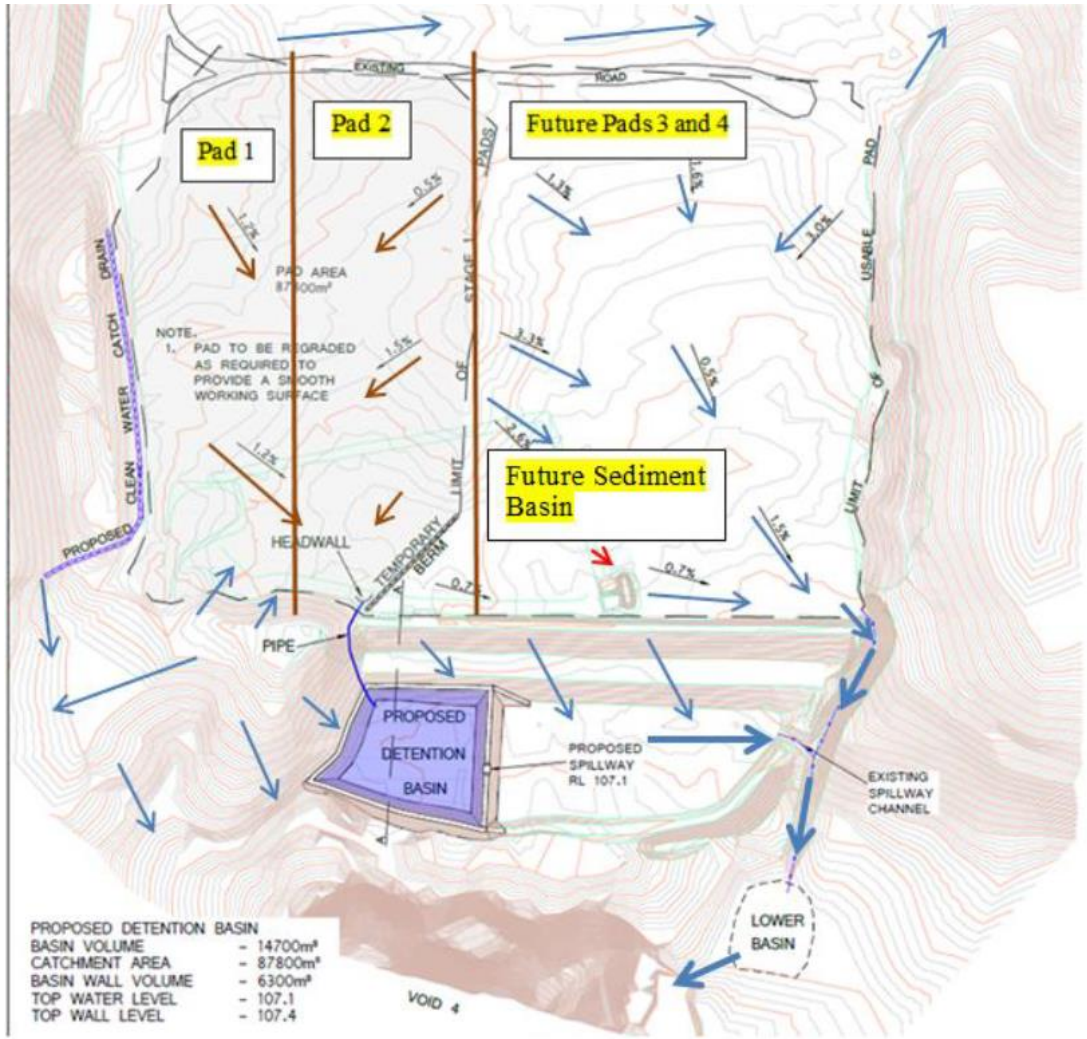
Appendix 4 – Figure 3: Layout of Project Area – Including Future Processing Areas



Appendix 4 – Figure 4: Gradient of Hardstand



Appendix 4 – Figure 5: Stormwater Flow Diagram



Appendix 4 – Figure 6: Sydney Phylloxera Infested Zone (PIZ)

Source: Sydney Basin Phylloxera Infested Zone (Department of Primary Industries, 2006)

Appendix 4 – Figure 7: Survey Plan