

ELF FARM SUPPLIES PTY LTD

MUSHROOM SUBSTRATE PLANT MULGRAVE

Environmental Management Strategy



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INTRODUCTION

1.1 BACKGROUND

A mushroom substrate plant has operated at 108 Mulgrave Road, Mulgrave since 1981. The operator of the facility was known as Elf Mushrooms Pty Ltd until 1997 when the company changed its name to Elf Farm Supplies Pty Ltd. The location of the facility is shown on *Figure 1*. A description of the site is presented in section 2.

The plant operated for 31 years under a series of development consents issued by Hawkesbury Council. On 11 January 2012 the Minister for Planning granted project approval for expansion and continued operation of the substrate plant. That approval required all previous development consents to be surrendered. The operation is licensed by the Environment Protection Authority. *Appendix A* contains the project approval and *Appendix B* contains a copy of licence No 6229, current at the time of preparing this strategy.

1.2 PURPOSE OF THE EMS

This environmental management Strategy (EMS) provides the strategic framework for environmental management during operation of the substrate plant. The objectives of the EMS include:

- specify environmental requirements and mitigation measures for plant operation derived from the project approval and environment protection licence;
- enable the operator to ensure compliance with environmental legislation;
- promote best practice environmental management.

The EMS does not refer to construction work undertaken from time to time at the substrate plant, including work approved in the project approval. A separate construction environmental management plan refers to construction work.

The EMS includes within a single document, the environmental requirements for operating the site and will be a reference document for the plant manager and owner. The operator will not need to research any other document to determine environmental practices, operational requirements or standards.



FIGURE 1
21012012
Substrate Plant Location

The EMS also provides a framework to assist Elf Farm Supplies should it wish to develop and implement an Environmental Management System for the site in accordance with AS 14001.

1.3 CONTENT

The EMS has been prepared consistent with condition 1 of Schedule 5 of the project approval for expansion of the substrate plant dated 11 January 2012. Condition 1 of Schedule 5 is as follows:

1. *The Proponent shall prepare and implement an Environmental Management Strategy for the Project to the satisfaction of the Director-General. The Strategy must:*
 - a) *be submitted to the Director-General for approval prior to the commencement of operation;*
 - b) *provide the strategic framework for environmental management of the Project;*
 - c) *identify the statutory approvals that apply to the Project;*
 - d) *describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the Project;*
 - e) *describe the procedures that would be implemented to:*
 - *keep the local community and relevant agencies informed about the operation and environmental performance of the Project;*
 - *receive, handle, respond to, and record complaints;*
 - *resolve any disputes that may arise during the course of the Project;*
 - *respond to any non-compliance; and*
 - *respond to emergencies;*
 - f) *include:*
 - *copies of the various strategies, plans and programs that are required under the conditions of this approval once they have been approved; and*
 - *a clear plan depicting all the monitoring currently being carried out within the Project area.*

Other conditions in the project approval that specify content of the environmental management strategy are included in Schedule 3 of the approval. These conditions are reproduced below and addressed in the EMS.

4. *The Proponent shall prepare and implement an Odour Management Plan for the Substrate Plant site to the satisfaction of the Director-General. This plan must:*
 - (a) *be prepared in consultation with the OEH by a suitably independent, qualified and experienced expert whose appointment has been endorsed by the Director-General;*
 - (b) *be submitted to the Director-General for approval within 3 months of the date of this approval;*
 - (c) *describe in detail the measures that would be implemented on site to minimise the odour impacts of the Project, such as storing the stable bedding in the pre-wet shed extension building in Stages 2 and 3. and to ensure that these measures remain effective over time;*
 - (d) *identify triggers for remedial and contingency action; and*
 - (e) *include a program for monitoring the odour impacts of the Project*

9. *The Proponent shall prepare and implement an Energy Efficiency Plan on the Substrate Plant site to the satisfaction of the Director-General. This plan must:*
- (a) be submitted to the Director-General for approval prior to the commencement of operations on the site;*
 - (b) describe the measures that would be implemented to minimise energy use on the site;*
 - (c) explore the possibility of using renewable energy use to generate power; and*
 - (d) include a program to monitor the effectiveness of these measures, and a protocol to periodically review the plan.*
17. *The Proponent shall prepare and implement a Water Management Plan for the Substrate Plant site to the satisfaction of the Director-General. The plan must be submitted to the Director-General for approval prior to the commencement of operation of Stage 1 and be prepared in consultation with OEH and NOW.*
22. *The Proponent shall prepare and Implement a Noise Management Plan for the Substrate Plant site in consultation with OEH to the satisfaction of the Director-General. The Plan must be submitted to the Director-General for approval prior to commencement of operations, and include a noise monitoring protocol for evaluating compliance with the noise impact assessment criteria in this approval.*

Other conditions in Schedule 3 of the project approval specify particular requirements which are encompassed in the environmental management procedures detailed in this document.

In preparing the Environmental Assessment for the project (Perram & Partners 2010), studies were undertaken to assess potential impacts and prescribe suitable management or mitigation measures. Mitigation measures were summarised in the Statement of Commitments included in that document and subsequently revised and incorporated into the project approval (see *Appendix A*). The Statement of Commitments is partitioned to identify the section that is relevant to operation of the substrate plant. All relevant mitigation measures from the Statement of Commitments have been included in the EMS.

The *Guideline for Preparing Environmental Management Plans* (DoPI 2004) was consulted in preparing this document.

1.4 VALIDITY

Conditions 4, 17 and 22 require consultation with either OEH or NOW or both. In satisfaction of these requirements draft copies of relevant sections the EMS were forwarded to the Office of Environment and Heritage and the NSW Office of Water for comment.

The EMS is a perpetual document, capable of being amended and updated as needed to take account of changes occurring from time to time. Such updates will enable the operator to keep the document relevant to changing circumstances ~~including~~

- future planning approvals or amendments issued pertaining to operation or further development of the plant;
- periodic review of the conditions of the environment protection licence;
- modified practices based on monitoring results, revised EPA guidelines or emerging technology;

The EMS will be reviewed at least every three years from the date of its approval in compliance with the project approval, as explained in section 8.2.2. Any resulting amendment will take effect when approved of the Director-General.

1.5 RELEVANT LEGISLATION

Legislation that may be relevant to aspects of the construction project is listed in *Appendix G*.

2

SITE OVERVIEW

2.1 PROPERTY DESCRIPTION

The rural property upon which the substrate plant is located comprises lots 13 and 14 DP 1138749. The substrate plant site has an area of about 12.4 hectares and includes Lot 14 and part of Lot 13. The site is roughly triangular in shape with a small frontage to Mulgrave Road, as shown on *Figure 1*.

The land is owned by RN & NR Tolson.

2.2 ENVIRONMENTAL CHARACTERISTICS

2.2.1 *Topography and Drainage*

The substrate plant is located in the South Creek flood plain, approximately 300 metres east of South Creek. Natural ground level in the vicinity slopes gently towards the creek, ranging in height from about 9 to 16 metres AHD. The site has been filled to a level of approximately 16 metres AHD to afford protection against the majority of flood events.

The southern boundary of the site adjoins a railway embankment. There is a narrow depression between the adjoining filled lands, draining towards South Creek.

2.2.2 *Geology and Soils*

The combined flood plains of the Hawkesbury River, Rickabys Creek and South Creek contain a fluvial soil landscape. This material extends onto the property and comprises deep brown sands and loams overlying shales of the Wianamatta Group.

The substrate plant has been constructed on fill to increase its elevation and thereby reduce the frequency of flooding. The soil material within the developed area of the site is clean fill imported for the purposes of raising the surface level.

2.2.3 Climate

The nearest source of climactic information for the Mulgrave area is Richmond Air base, where records have generally been kept for over 70 years.

Table 2.1 presents a summary of significant data from the Richmond recording station.

Table 2.1 TEMPERATURE, RAINFALL, DEW, WIND AND EVAPORATION

Item	J	F	M	A	M	J	J	A	S	O	N	D	Year
Mean Daily Max. Temp. (°C)	29.6	28.6	27	23.9	20.3	17.6	17.2	18.8	21.6	24.5	26.8	28.7	23.7
Mean Daily Min. Temp. (°C)	17.4	17.4	15.5	11.8	7.9	5.1	3.6	5	7.5	11	13.7	15.9	10.9
Mean Rainfall (mm)	93.3	106	92.1	70.3	58.8	56.4	35.9	45.8	40.2	64.1	76.1	71.7	810.3
Mean No of Rain days	10.9	11.1	11.2	9.1	8.5	8.1	6.4	7.5	7.6	9.6	10.3	9.9	110.3
9am Mean Dew Point (°C)	16.7	17.2	15.6	12.7	9.3	6.4	4.7	5.7	7.6	10.3	12.4	14.7	11.1
3pm Mean Dew Point (°C)	15.5	16	14.4	11.6	9.3	6.9	5	4.6	6	8.7	11.1	13.3	10.2
Mean 9 am wind speed (km/h)	5	4.8	4.7	4.1	4	4.4	4.7	6	6.7	8.2	7.7	6.4	5.5
Mean 3 pm Wind Speed (km/h)	13.5	12.6	11.9	10.7	9.2	10.1	11.5	14.6	16.5	16.3	16.7	15.4	13.2
Highest recorded wind gust (km/h)	106	115	122	88.9	96.5	109	126	111	117	115	109	135	135.4
Mean Daily Pan Evaporation (mm)	6.3	5.4	4.4	3.3	2.1	1.8	2	3.1	4.3	5.4	5.9	7	4.3

Wind Data

Hourly wind data have been collected from the site of the substrate plant for more than a decade. On an annual basis the predominant winds are from the NNE and SSW.

2.2.4 Hydrology

The substrate plant is located within the catchment of South Creek at the upper edge of the flood plain. There are two farm dams on the property receiving natural drainage and directed runoff from building roofs and non-operational areas of the site. Water collecting in the dams is used for pasture irrigation. The primary water source for

substrate production is a licensed submersible pump in South Creek. A small section of the building roof water drains to a culvert passing under the adjoining railway embankment, leading to a farm dam on the neighbouring property.

The site does not interact with groundwater as the production area of the plant has been erected on a concrete platform.

The 100 Year ARI (average recurrence interval) flood level is 17.3 metres AHD (Hawkesbury City Council). The substrate plant has been constructed on a platform raised to approximately 16 metres AHD and is designed to withstand occasional minor inundation. The plant has not been flooded since it was constructed in 1981, although Mulgrave Road has twice been cut by floodwaters in this period.

2.2.5 Surrounding Land Use

Surrounding land use is illustrated on *Figure 1*. On its southern side the substrate plant mostly adjoins the Blacktown-Richmond Railway. Near Mulgrave Road, the southern boundary steps in to pass around a separate narrow allotment for the former station master's cottage, now abandoned and derelict. Mulgrave Station is about 100 metres from the property frontage. Mulgrave is a rural village with a few houses clustered near the railway station. It is surrounded by rural land to the west, south and east. There is an industrial area immediately north of the railway station.

Most of the northern site boundary abuts the embankment of the elevated main road, Hawkesbury Valley Way. The remainder of the northern boundary adjoins another rural property. A sewage treatment plant is located about 700 metres to the north beside Mulgrave Road, with Windsor High School opposite.

Lot 13 extends westward to South Creek, although the substrate plant boundary is set back about 150 to 200 metres from the creek at the edge of the filled land. The balance of Lot 13 is a grassed paddock with a gentle slope to South Creek. This land is used for cattle grazing. On the western side of South Creek a strip of higher land beside the railway line has been developed as a residential area. The closest residences in this estate are in Chisholm Place, about 500 metres from the substrate plant.

In addition to the substrate plant buildings, the site contains a residence near the Mulgrave Road frontage occupied by a person employed at the site. Access to the substrate plant is obtained via a private roadway intersecting Mulgrave Road beside Hawkesbury Valley Way overbridge.

The nearest residences not associated with the substrate plant include:

- 2.2.5.1 a rural residence on the adjoining grazing property to the north;
- 2.2.5.2 a rural residence on the market garden immediately south of the rail line;
- 2.2.5.3 Mulgrave village to the south east; and

2.2.5.4 Chisholm Place (part of Windsor residential area) to the west.

2.2.6 Existing Noise Levels

For the purposes of the Environmental Assessment (Perram & Partners 2010), Atkins Acoustics measured ambient noise levels in the vicinity of the site in March 2009. The measured rated background level (RBL) and L_{Aeq} noise levels are detailed in *Appendix D* and summarised in *Table 2.2*. Background noise measurements were not adversely affected by wind speeds averaging greater than five metres per second or rain.

Table 2.2 MEASURED RBL AND L_{Aeq} NOISE LEVELS

Location	Rated Background Level (L_{A90})			Ambient L_{Aeq} Level (L_{Aeq})		
	Day	Evening	Night	Day	Evening	Night
Chisholm Place (west)	41	42	39	57	58	55
Rural dwelling (north)	42	42	38	53	57	53
Rural dwelling (south)	42	43	37	53	49	46

NOTE: Day: 7 am to 6 pm (Monday to Friday), 8 am to 6 pm (Sunday and public holidays)
Evening: 6 pm to 10 pm
Night: 10 pm to 7 am (Monday to Friday), 10 pm to 8 am (Sunday and public holidays)

2.2.7 Natural Vegetation and Fauna

The Environmental Assessment (Perram & Partners 2010) included a flora and fauna study of the area to be affected by construction and operational activities. The assessment found that owing to extensive re-contouring, the site contains no remnant vegetation and almost no habitat attributes that would attract native fauna.

2.2.8 Landscaping and Screening

Native trees and shrubs have been planted around the substrate plant to provide screening between the developed part of the property and surrounding properties. Screening vegetation is most effective on the northern side, limiting viewing opportunities into the site from Mulgrave Road and Hawkesbury Valley Way.

Additional planting is taking place to enhance the existing screen and extend it around the western side as part of the approved extension of the filled area.

2.2.9 Archaeology and Heritage

The Environmental Assessment (Perram & Partners 2010) included an archaeological and cultural heritage assessment. This investigation did not identify any Aboriginal sites or relics. The study concluded that previous rural land uses and subsequent re-contouring reduced the likelihood of finding intact archaeological cultural deposits.

2.2.10 Access

The site access road joins with Mulgrave Road about 100 metres north of the rail level crossing. Vehicles accessing the site normally travel via Mulgrave Road and Hawkesbury Valley Way. An alternative connection to the site is via Windsor Road and Mulgrave Road.

2.3 APPROVED DEVELOPMENT

Approved development of the substrate plant is described in the Environmental Assessment (Perram & Partners 2010). Development of the site will take place in three stages over about 10 years associated with progressive increases in the weekly tonnage of substrate produced. Development to be undertaken in each stage is listed in *Table 2.3* and shown on *Figure 2*.

Table 2.3 STAGES OF EXPANSION AT THE SUBSTRATE PLANT

Stage	Development Works
1	<ul style="list-style-type: none">• Construct an additional straw bale storage shed;• Fill a 1.6 hectare area on the western side of the pre-wet shed to 16 m AHD;• Minor modifications: extend the emergency backup generator room, construct a small store room, provide sealed parking areas and modify drainage to improve storm water detention and water quality.
2	<ul style="list-style-type: none">• Construct<ul style="list-style-type: none">- a second pre-wet shed with conveyor;- a second bio scrubber with chimney- a second bale storage shed;- a second bale wetting area;- a new Phase 2/3 tunnel building with 13 tunnels; and- an overhead supply conveyor; and• Remove the old weighbridge.
3	<ul style="list-style-type: none">• Construct two additional Phase 1 tunnels; and• Expand the new Phase 2/3 tunnel building constructed in Stage 2 to include an extra 9 Phase 2/3 tunnels and a storage tunnel.

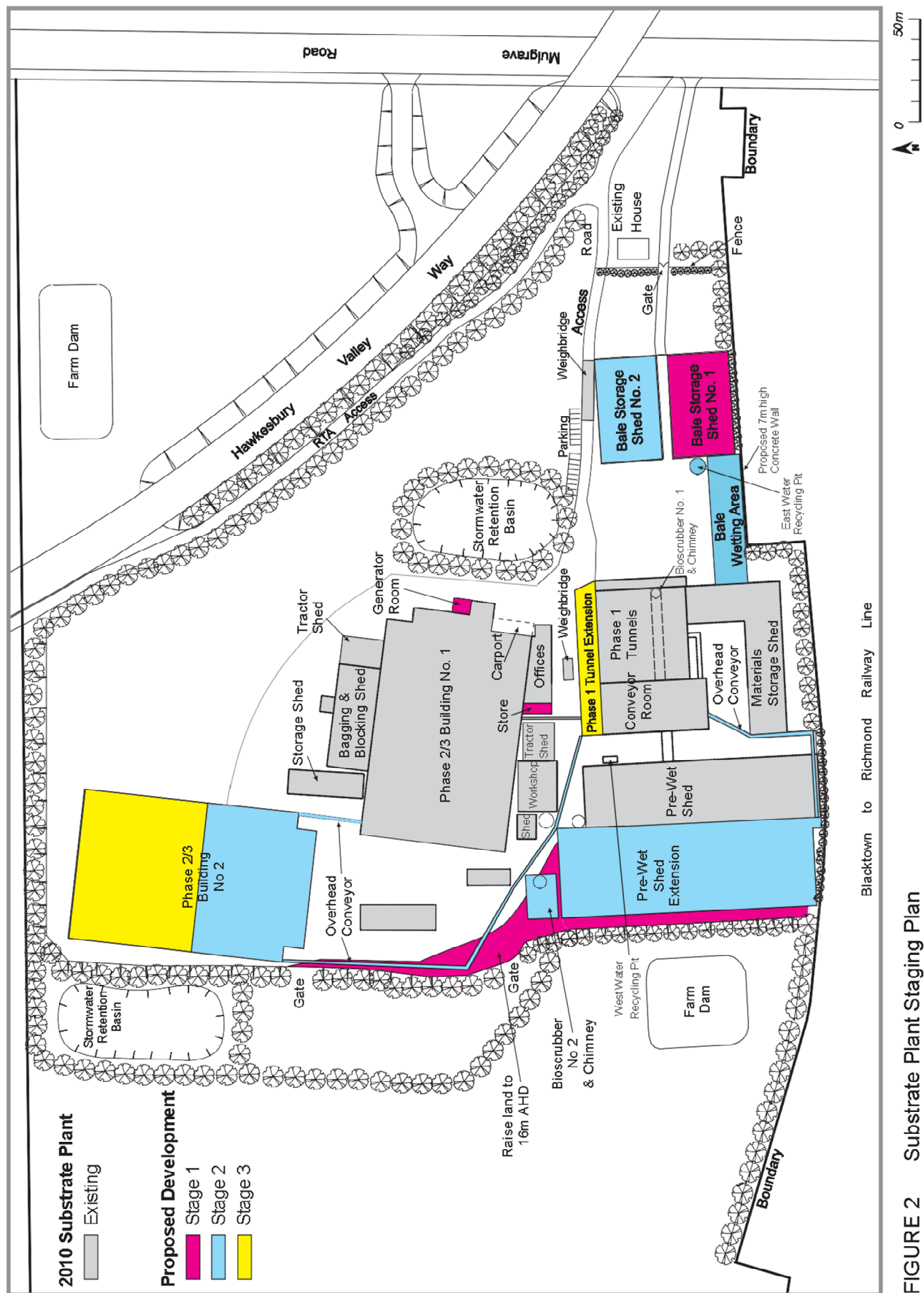


FIGURE 2 Substrate Plant Staging Plan

MANAGEMENT RESPONSIBILITY

3.1 ORGANISATION STRUCTURE

The Managing Director of Elf Farm Supplies Pty Ltd, Mr. Rob Tolson, has ultimate responsibility for development and operation of the Mulgrave substrate plant. The Operations Manager is responsible for day-to-day operation of the plant, reporting to the General Manager.

When the Operations Manager is absent for any significant length of time (holidays), an acting manager is appointed, assisted as required by the General Manager.

While construction work is underway, a construction manager may be present on site to supervise and co-ordinate work undertaken by contractors and builders.

In addition a number of personnel visit the site each week providing services to the plant.

3.2 CONTACT DETAILS

The phone number of the premises for business calls during office hours is 02 4577 5000.

The 24-hour complaints hot line number is **02 4577 9163**

3.3 ROLE RESPONSIBILITY AND AUTHORITY

Plant personnel are multi-skilled, undertaking a number of tasks during the course of their work. The formal management roles of staff at various levels is summarised in *Table 3.1*.

Table 3.1 ROLE, RESPONSIBILITY AND AUTHORITY

Task	Managing Director	General Manager	Operations Manager	Operational Staff
Plant Development	Assist General manager to set objectives and develop plans, provide industry experience, review detailed planning and approval processes.	Assess future needs of the plant, develop plans, obtain approval, then coordinate and oversee construction projects to achieve overall objectives.	Assist with long term planning; undertake minor construction projects.	Assist with minor construction projects as required.
Substrate Production	Review performance of the plant, assist General Manager in market development.	Develop markets for substrate; overview operation of the plant to ensure production objectives are achieved.	Plan and supervise plant operation on a daily and longer term basis to produce the required quantity of quality substrate; operate plant for maximum efficiency	Undertake day to day operational tasks as required
Environmental Management	Independently review indicators of environmental performance, confirm compliance with environmental objectives and approvals.	Approve the EMP and any subsequent amendments; ensure that environmental objectives are understood; monitor plant operation to confirm compliance	Program work and take corrective action as required to maintain plant operations within environmental objectives set down in this EMP. Respond to all incidents and complaints.	Undertake work within guidelines set down by the Operations Manager.
Community Liaison	Assist with community relations as required.	Assist the plant manager as required; participate in all forums where community comment on the plant is expected.	Work with community to ensure that an adequate response is given when environmental issues are raised.	

Task	Managing Director	General Manager	Operations Manager	Operational Staff
Induction and Training		Ensure that an adequate induction and training program is given to staff	Provide induction and training for all staff. Retain records of all training given.	Attend training sessions conducted by the Operations Manager; if unsure about any aspect of the work, ask the Operations Manager.
Complaints Register		Review complaints register. Ensure procedures are followed. Review effectiveness of corrective action. Ensure records are available for audit.	Record details of any complaints and investigate. Provide a response to every complaint received. Decide and implement corrective action.	
Monitoring		Ensure that the monitoring program is adequate and effectively implemented. Review all results with the Operations Manager. Initiate audits.	Arrange for monitoring to be carried out in accordance with the program. Review results with the General Manager.	
Recording		Maintain records of all communications with approval and regulatory bodies. Ensure that monitoring results are forwarded when required.	Maintain records of plant operations, including quantities of materials received and dispatched and all monitoring results.	

Task	Managing Director	General Manager	Operations Manager	Operational Staff
Emergency Action		Intervene at any time where there is an unacceptable risk to safety, or significant environmental damage may occur. Review procedures as required.	Intervene at any time where there is an unacceptable risk to safety, or significant environmental damage may occur. Arrange remedial measures to overcome the emergency.	Advise the plant manager of any suspected risk to safety, or any likelihood of significant environmental damage. Take action as required to prevent emergency situations arising.

3.4 STAFF TRAINING

All staff employed at the Mulgrave substrate plant are trained in their responsibilities. Any new operational personnel are given induction training by the plant manager. New office personnel are trained by the general manager. Refresher training is provided as required with a maximum time between training of two years.

4

PLANT OPERATION

4.1 PRODUCTION LIMIT

Prior to commencement of the project approval, the quantity of substrate dispatched from the plant was limited by Hawkesbury City Council development consent No MA623/02. The consent effectively limited production to 1000 tonnes of Phase 1 substrate per week¹.

The project approval supersedes the Council consent, setting a final production limit of 3,200 tonnes of Phase 1 substrate per week with a maximum dispatch of 1920 tonnes of Phase 3 substrate per week (condition 6). Condition 6 also requires that separate approvals be obtained from the Director-General to increase production in stages. The preconditions for applying for staged approvals are shown in *Table 4.1*.

Table 4.1 PRECONDITIONS FOR INCREASED PRODUCTION

Stage	Preconditions	Allowable application for increase
1	<ul style="list-style-type: none"> • Odour management plan prepared and implemented; • Independent odour audit prepared and submitted. 	1,600 tpw
2	<ul style="list-style-type: none"> • Producing Phase 1 substrate at a rate between 1500 and 1600 tonnes per week • Independent odour audit prepared and submitted during this level of production 	2,400 tpw
3	<ul style="list-style-type: none"> • Producing Phase 1 substrate at a rate between 2300 and 2400 tonnes per week. • Independent odour audit prepared and submitted during this level of production 	3200 tpw

¹ 1000 tonnes of Phase 1 substrate reduces during processing to 600 tonnes of Phase 3 substrate

4.2 PRODUCTION PROCESS

Figure 3 is a process flow diagram illustrating the substrate production process. The various steps in producing substrate are described below.

4.2.1 Raw Materials Storage

Raw materials used in substrate manufacture include wheaten straw, water, poultry manure, other recycled agricultural products, gypsum and dry stable bedding. Materials are delivered by road as required.

Solid raw materials, other than straw, are stored in a three-sided shed, leaving an open side for material to be delivered by tip truck. These ingredients are kept in a dry state under cover. Straw is stored in the designated bale storage area located in the South-Eastern section of the premises.

4.2.2 Bale Wetting

Straw is softened by watering prior to use in the composting process. Straw bales are spray watered in the bale wetting area for several days to remove the waxy layer and increase water content. Water draining from the bales is collected, filtered, aerated and recirculated via the sprays. Make-up water is continually added to the process as the straw bales soak up to four times their dry weight.

4.2.3 Pre-Wet

Using front end loaders, wetted straw bales are laid out in rows in the pre-wet building. Dry ingredients are transported to the building by a Kuhn mixing trailer and blended with the straw and water using a mobile blending machine. The building is totally enclosed and kept under negative air pressure with air recirculated through the floor beneath the rows. Under the current configuration of the plant, exhaust air passes from the pre-wet building through ducts into the Phase 1 tunnel building and thence to the No 1 bio scrubber. Stage 2 of the project provides for a second pre-wet shed and a second bio scrubber. When this arrangement is commissioned, the No 2 bio scrubber will be dedicated to treating air exhausted from the pre-wet building.

The pre-wet process takes up to one week, with the blending machine adding water, mixing and turning each row at least every second day. As the plant is presently configured, the finished pre-wet material is transported from the building using front end loaders. Stage 2 of the project includes a conveyor to make this transfer more efficient.

Minimum 6 Weeks Production Process Time

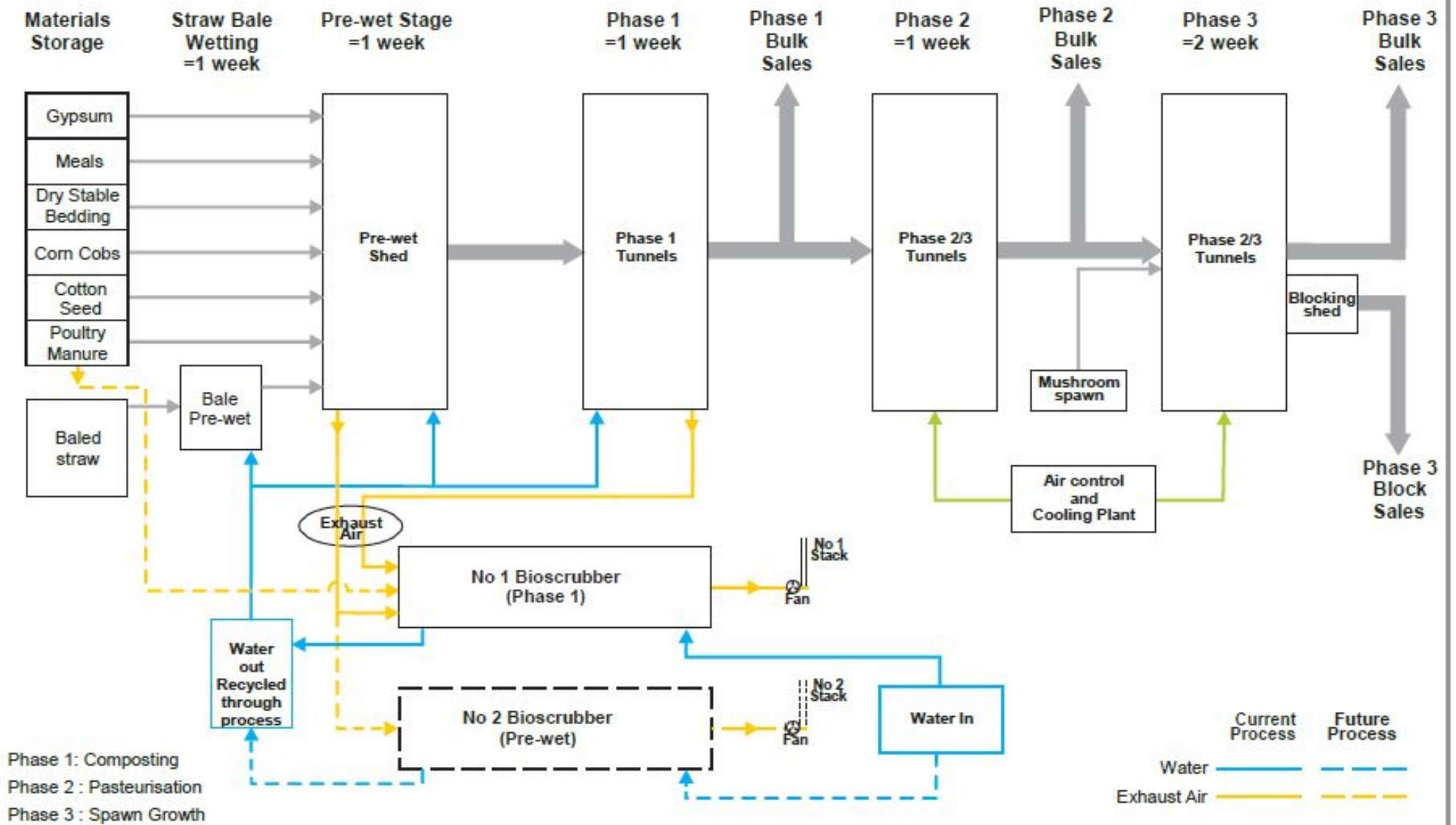


FIGURE 3 Process Flow Diagram

4.2.4 Phase 1 Composting

Incoming pre-wet material is delivered to a hopper feeding an external conveyor system that transports the mix to a nominated tunnel and drops it through the ceiling. An internal conveyor operating just below the ceiling drops the substrate evenly along the tunnel floor.

The high-temperature composting phase takes place in tunnels for up to one week. Approximately 450 tonnes of material can be processed in a tunnel. The mix must remain above 75° Celsius for at least 90 hours to enable the process to reach completion. Part way through the process, the tunnel is emptied by front end loader and the contents placed in the hopper where water is added uniformly and the mix returned by conveyor to an empty tunnel.

The finished Phase 1 product is placed in the hopper so that the conveyor system can either load it to trucks for delivery as Phase 1 substrate or transfer it to the Phase 2/3 tunnel building for further processing.

The Phase 1 tunnel building, including the work space at its western end, is enclosed and maintained under negative pressure. Air is recirculated through the floor of each tunnel to aerate the composting material. Exhaust air from the tunnels passes through the bio scrubber and then is discharged via the chimney.

4.2.5 Phase 2 and Phase 3 Processing

Phase 2 is a pasteurisation process undertaken at high temperature on finished compost to kill unwanted spores and organisms. Phase 3 is the initial growth of mushroom spawn from introduced mycelium, undertaken in controlled atmospheric conditions. These operations take about two to three weeks of processing, depending upon dispatch days.

Utmost cleanliness in the buildings is required to avoid foreign spores or pathogens contaminating the pasteurised substrate. All air used in the process is filtered down to five microns absolute.

The Phase 2 and Phase 3 treatments are part of the horticultural process of growing mushrooms, traditionally carried out at mushroom farms. The Phase 2 and 3 processing at Mulgrave plant has relieved farms of the need to undertake these initial steps and provides a higher quality and more consistent product.

4.2.6 *Product Delivery*

Substrate can be delivered from the plant following Phase 1, Phase 2 or Phase 3 processing, depending on the preference of mushroom farms. Since 2005 when Phase 2 and Phase 3 processing was introduced at the Mulgrave plant, mushroom farms have increasingly preferred to receive the Phase 3 “finished” substrate. Consequently Elf Farm Supplies intends to move towards discontinuing supply of substrate that has not been fully processed to Phase 3.

Phase 3 substrate is loaded indoors and transported in bulk using semi-trailer vehicles. If necessary to prevent contamination, trucks are cleaned down prior to entering the loading area. Vehicles are normally loaded and dispatched during the night and early morning to meet the requirements of the receiving mushroom farms.

Elf Farm Supplies is also moving into supplying products tailored to specific needs of the commercial and home markets. Some older mushroom farms will experience greater efficiency if the spawned substrate is prepared in the form of plastic-wrapped blocks, suitable for placing directly on growing shelves or trays. There is also a market for do-it-yourself growers who require spawned substrate pre-wrapped and ready to place in a suitable growing environment at home.

A blocking shed attached to the Phase 2/3 tunnel building enables packaged substrate to be prepared and loaded into vehicles external to the processing tunnel building.

4.2.7 *Hours of Operation*

The substrate plant operates 24 hours per day, seven days per week. Refrigeration plant and ventilation/aeration equipment operates continuously to maintain essential conditions for the process. Most outdoor operations are scheduled for daylight hours. Deliveries and dispatches currently occur throughout the day and night period. The extended plant will continue to operate in this manner.

4.2.8 *Operational Plant and Equipment*

Mobile plant used at the facility includes front end loaders, trucks, tractors, forklifts, access equipment and blending machines. Fixed mechanical plant includes conveyors, fans, pumps, generators, refrigeration plant, compressors and the like.

4.3 BIOSCRUBBER

The existing No 1 bio scrubber processes air collected from the Phase 1 tunnels and some of the air from the pre-wet shed. The bio scrubber occupies a space between Phase 1 tunnels, having dimensions, 45 metres long, three metres wide and seven metres high. A plenum floor is suspended 4.5 metres above the base to divide the bio scrubber into upper and lower chambers. The walls, floor, roof and plenum floor are made of reinforced concrete. On the lower floor, two concrete transverse weirs extend from the floor to a height of approximately one metre dividing the base into three equal segments.

Process air flows through the bottom chamber, rises to the upper chamber and returns to the eastern end, discharging via the chimney. A series of frames stand on the floor of the upper chamber, causing the airflow to frequently change direction. Attached to the frames are media designed for growth of odour-absorbing micro-organisms.

Water is recirculated within both chambers of the bio scrubber via a series of spray nozzles attached to the underside of the roof, keeping the baffles wet and the air humid. Circulating water accumulates in the bottom chamber behind each weir and progressively overflows towards the lower eastern end where water is extracted for use as process water.

Odour tests of air entering and leaving the bio scrubber have demonstrated a minimum 70 per cent reduction in odour as the air is processed. The No 2 bio scrubber, to be installed as part of the expansion project, will separately process air from the extended pre-wet shed, leaving the existing bio scrubber to process air from the Phase 1 tunnels and enclosed loading area.

The No 2 bio scrubber will have similar internal characteristics to the existing unit, but has been designed as a more compact stand-alone structure with plan dimensions 22 by 15 metres. Air will follow a zigzag path, travelling the length of the structure three times on each level before reaching the chimney. Recirculating water will collect in a below-ground storage at the base.

4.4 TYPICAL BATCH PROCESSING SCHEDULE

The following schedule is typical for operations at the plant when two batches of substrate undergo Phase 1 processing at the plant.

BATCH A		
Day	Typically	Action
1	Sunday	Commence bale wetting in outdoor bale wetting area
6	Friday	Transfer wet straw to pre-wetting building, break bales and add 60% of ingredients, start medium/high temperature pre-wet
7	Saturday	Turn batch and add final 40% ingredients
9	Monday	Turn batch, add water Transfer the entire batch to two tunnels (bunkers??) for high temperature phase 1, whilst adding water
12	Thursday	Remove, water and return contents of tunnels for Phase 1 processing
16	Monday	Remove, water and return contents of tunnels for Phase 1 processing
17	Tuesday	Empty tunnels and dispatch or send for Phase 2 and 3 processing

BATCH B		
Day	Typically	Action
1	Thursday	Commence bale wetting in outdoor bale wetting area
6	Tuesday	Transfer wet straw to pre-wetting building, break bales and add 60% ingredients, start medium/high temperature pre-wet
7	Wednesday	Turn batch and add final 40% ingredients
8	Thursday	Turn batch, add water Transfer entire batch to two tunnels (bunkers???) for high temperature phase 1, whilst adding water
12	Monday	Remove, water and return contents of tunnels for Phase 1 processing
15	Thursday	Remove, water and return contents of tunnels for Phase 1 processing
16	Friday	Empty tunnels and dispatch or send for Phase 2 and 3 processing

Phase 2 and 3 processed substrate can be dispatched after approximately a further three weeks of processing with flexibility to deliver the product on any weekday to suit the schedule of the customer mushroom farms.

ENVIRONMENTAL MANAGEMENT

Management of environmental performance is described in this EMS by setting objectives, identifying performance requirements, specifying strategies and actions and providing mechanisms for monitoring, reporting and corrective actions.

Environmental issues and mitigation measures have been derived from the Environmental Assessment (Perram & Partners 2010), the project approval (see *Appendix A*) and the specific management plans prepared as required by the project approval and included in appendices C to F.

5.1 WATER MANAGEMENT

5.1.1 Introduction

A water management plan for the substrate plant is included attached as *Appendix C*. The tabulated plan below is derived from the detailed plan, the former site EMP and the Environmental Assessment, having regard to condition 14 in schedule 3 of the project approval. Condition 14 specifies that the Proponent must comply with section 120 of the POEO Act except as expressly provided by an environmental protection licence. Section 120 of the POEO Act makes it an offence to pollute waters.

5.1.2 Water Management Protocols

Potential Issues	<ul style="list-style-type: none"> • Escape of operational water from the site • Excessive water consumption
Potential Sources	<ul style="list-style-type: none"> • Site operations
Objective	<ul style="list-style-type: none"> • Manage operational water to ensure all water is consumed and there is no escape to the environment • Minimise water consumption on the site; • Manage storm water to remove sediment and any nutrients
Design features	<ul style="list-style-type: none"> • Water sources: <ul style="list-style-type: none"> – Submersible pump in South Creek – Licensed borehole – Sydney Water supply – Rainfall runoff from within the plant area • Existing pre-2012 :storm water drainage (before project approval) <ul style="list-style-type: none"> – roof water from all major structures with the exception of the

	<p>materials shed is directed to the farm dams on the property;</p> <ul style="list-style-type: none"> – roof water from the materials shed flows through a culvert beneath the Blacktown – Richmond Railway to a dam on the neighbouring farming land; – surface water from non-operational areas and roadways of the site is directed to farm dams on the property; – surface water from the operational area of the site including the bale wetting area drains to the west water recycling pit; – The west water recycling pit has capacity to hold the first flush of storm water from operational areas; – should the pit become full during a rainfall event, an inlet diverter directs further runoff to a farm dam dedicated for this purpose. <ul style="list-style-type: none"> • Upgraded retention basins and water quality structures to be installed as part of the plant expansion.
Actions / Controls	<ul style="list-style-type: none"> • Utilise water in accordance with the following priority: <ul style="list-style-type: none"> (i) West water recycling pit - whenever the pit contains water above its normal operating level, extract water to lower the level and restore holding capacity for storm water; (ii) Bio scrubber reservoir - provided the level remains above the designed minimum; (iii) 120,000 litre storage tank; (iv) Sydney Water service. • Apply process water only at locations where there is a sealed operational surface so any spillage or surplus will drain to a water recycling pit; • Maintain substrate in a “thirsty” state to effectively eliminate escape of liquids; • Maintain adequate holding capacity in the west water recycling pit with backup farm dam as described in <i>Appendix C</i>; • As soon as possible following rainfall, ensure that sufficient storm water is removed from the recycling pit to restore 29 cubic metres vacant capacity; • Ensure the maximum water level in the pit for normal (dry weather) operations remains clearly marked; • Utilise storm water from the farm dam west of the site as first priority for pasture irrigation whenever water collects in the dam; • Alternate the usage of pumps in the collection pit to verify that both remain operational; • Clean the operational areas of the site daily (if needed) to minimise the quantity of solid materials able to be washed into the storm water system.
Maintenance	<ul style="list-style-type: none"> • Clean the solids filter on the input to the recycling pit at least daily; • Remove any solids or sludge present in the recycling pit at intervals not greater than fortnightly and add to substrate being processed at the time;
Performance Indicators	<ul style="list-style-type: none"> • Water consumption per tonne of substrate does not increase with increased production. • Storm water system observed to be functioning correctly with no blockage or overflow.

Monitoring	<ul style="list-style-type: none"> Record of water consumption Visual inspection of storm water system satisfactory operation.
Corrective Action / Reporting	<ul style="list-style-type: none"> If a complaint is received the procedure described in section 6 is to be followed. The Operations Manager is to record any incidents or issues with regard to water management in the environmental journal

5.2 OPERATIONAL NOISE

5.2.1 Introduction

An operational noise management plan prepared by Atkins Acoustics and Associates is attached as *Appendix D*. The tabulated plan below is derived from the detailed plan, the former site EMP and the Environmental Assessment, having regard to conditions 19 and 20 in schedule 3 of the project approval. Condition 19 specifies operational noise criteria that are reproduced in section 7.3. Condition 20 confirms that the hours of operation of the plant are continuous.

5.2.2 Operational Noise Management Protocols

Potential Issues	<ul style="list-style-type: none"> Noise associated with plant operations annoying nearby residents and farm workers
Potential sources	<ul style="list-style-type: none"> Mobile plant (front end loaders, trucks, blending machine) Fixed mechanical plant (compressors, pumps, fans, conveyors) Trucks on the public road system accessing the site.
Objective	<ul style="list-style-type: none"> Manage day time noise to within prescribed limits for all neighbouring premises (Condition 19) Manage night time noise to within prescribed limits for residential Neighbours (Condition 19)
Design features	<ul style="list-style-type: none"> Existing pre-2012 design features (before project approval): <ul style="list-style-type: none"> all stationary noise making plant and equipment such as fans, pumps and conveyors are enclosed within buildings or structures; the ventilation plant room beside the Phase 1 tunnels has been designed to have a 290 mm thick concrete-filled block construction extending the full height up to the roofline, with insulated roof; front end loaders operate either indoors or in the bale wetting area surrounded by buildings to screen the noise; the truck filling area for Phase 1 substrate has been positioned in an area where trucks are surrounded by buildings or structures; the Phase 2 and 3 tunnels with their loading and unloading areas are fully enclosed within a large building; and acoustic input has been obtained in selection of plant and detailed design of relevant structures, fittings and plant

	<p>mountings.</p> <ul style="list-style-type: none"> • Develop the site generally in accordance with Figure 2. • Establish site levels approximately RL 16-17, building heights of approximately 8-12 metres for pre wet shed, 7-10 metres for bale storage shed and 11 metres for new phase 2/3 building; • Construct building walls (bale storage and pre wet) with concrete to two metres above FFL followed by galvanised steel frame and galvanised wall / roof sheeting nominally 0.6mm BMT and a minimum acoustic rating of Rw22. Final details subject to review prior to final specification • Construct internal walls and roof of tunnels within phase 2/3 building with concrete blockwork and/or Hebel panels/blocks; • Construct building wall cladding (Phase 2/3 building) with insulated colorbond sandwich panels consistent with existing Phase 2/3 building providing a nominal installed noise reduction in the order of 23dB(A) (Rw28 or greater). Final details subject to review prior to final specification; • Construct building roof cladding with sheet metal (min. 0.42 BMT) over fibreglass building blanket and medium duty thermofoil or similar and insulated colorbond sandwich panel (ceiling) consistent with existing Phase 2/3 building providing a nominal installed noise reduction in the order of 28dB(A) (Rw34 or greater). Final details subject to review prior to final specification;
Actions / Controls	<ul style="list-style-type: none"> • Adopt <i>best management practice</i> and <i>best available technology economically achievable</i> as encouraged by OEH. • Select cooling towers, compressors, conveyor drives, and mobile plant and equipment to satisfy the referenced acoustic performance (see Table 3. in <i>Appendix D</i>). • Arrange for mechanical plant and equipment selections to be reviewed by an acoustic consultant prior to final specification. • Install the southern boundary noise wall adjacent to the bale storage shed during Stage 1 construction works (condition 21). • Instruct and contract truck drivers to operate trucks on-site at less than 20kph and to switch off idle plant. • Fit mobile plant with low level or broadband 'quacker' reversing alarms. • Include correct use of plant and equipment to minimise noise impacts in site inductions and personnel / contractor training. • Arrange for trucks to travel in a forward direction throughout the site and minimise reversing or manoeuvring where possible. • Limit truck speed on Mulgrave Road to 50 kph. • Encourage drivers not to use engine exhaust brakes at night. • Limit night time truck movements to a maximum of eight movements per hour. • Ensure that doors to noisy areas are kept closed when not in immediate use.
Maintenance	<ul style="list-style-type: none"> • Inspect mobile plant and stationary equipment according to a program to ensure that the installed noise suppression systems are functioning as intended. • Maintain and repair equipment where necessary to meet original specifications for noise attenuation.

Performance Indicators	<ul style="list-style-type: none"> Monitoring results confirm plant is operating within limits. Absence of valid complaints from members of the public.
Monitoring	<ul style="list-style-type: none"> Visual and aural inspections when vehicles and items of plant arrive on site. Site attended noise monitoring in accordance with the monitoring program (section 7.3).
Corrective Action / Reporting	<ul style="list-style-type: none"> If a complaint is received the procedure described in section 6 is to be followed. The Operations Manager is to record any incidents or issues with noise in the environmental journal

5.3 ODOUR

5.3.1 Introduction

An odour management plan prepared by Todoroski Air Sciences is attached as *Appendix E*. The tabulated plan below is derived from the detailed plan, the former site EMP and the Environmental Assessment, having regard to conditions 2 and 3 in schedule 3 of the project approval. Condition 2 specifies that the Proponent shall not cause or permit the emission of offensive odours (as defined under Section 129 of the POEO Act) from the site. Condition 3 requires that the bio scrubber stacks be designed operated and maintained so as to achieve emissions compliance with the environment protection licence for the site.

5.3.2 Odour Management Protocols

Potential Issues	<ul style="list-style-type: none"> Odour associated with plant operations causing annoyance to persons external to the site.
Potential sources	<ul style="list-style-type: none"> Site operations
Objective	<ul style="list-style-type: none"> Manage all aspects of operations to keep odour emissions as low as possible and always within the limit specified in the environment protection licence.
Design features	<ul style="list-style-type: none"> Existing pre-2012 design features (before project approval): <ul style="list-style-type: none"> under-cover storage for raw materials to keep them dry; fully enclosed processing areas for all potentially odour-generating processes; air-under system in the pre-wet building and in all Phase 1 tunnels to improve aeration of the composting material; computer controlled fans to maintain optimum air supply and extraction; a vehicle tunnel to enable fully enclosed transfer of pre-wet material from the pre-wet building to Phase 1 tunnels; enclosed conveyor transport for tunnel loading, dispatch loading and transfer to Phase 2 & 3 tunnels;

	<ul style="list-style-type: none"> – a bio scrubber to remove odorous compounds from exhaust air prior to release to atmosphere; – a chimney to discharge exhaust air 40 metres above ground; – a monitoring system to detect any faults or operational anomalies and immediately send an alarm to the Duty Manager at any time of day. • Construct a second bio scrubber to treat emissions from the enlarged pre-wet shed, reducing the load on the existing bio scrubber; • Install an enclosed conveyor from the pre-wet building to the Phase 1 tunnel building, replacing the vehicle passageway; • Apply negative pressure to the raw materials storage shed, reducing the potential for fugitive emissions from poultry manure and other materials.
Actions / Controls	<ul style="list-style-type: none"> • Clean up any spillage in front of the ingredients store or elsewhere on a daily basis; • Remove solid material from the collection pit screen daily; • De-sludge the collection pit (if sludge is present) at least fortnightly; • Keep doors to internal process areas closed when not in use, except where this has no significant effect on the plant's odour performance; • Maintain appropriate conditions of temperature and oxygen content during composting, consistent with the needs of the process, to minimise odour generation; • Ensure the exit velocity of air from the chimney always achieves the minimum requirement determined by odour dispersion modelling; • Operate the bio scrubber in a manner to maximise its efficiency at removing odour from the air stream; • Minimise as far as practicable the duration of any bypassing of the bio scrubber for maintenance; • Plan any bio scrubber bypassing to occur when hot substrate is not being turned and when favourable weather conditions will assist dispersion; • Consider enclosing the bale wetting area or using a completely different method to wet the bales; • Optimise the time taken and efficiency of transporting pre-wet material to the Phase 1 tunnels; • Optimise the timing and frequency of turning each windrow at pre-wet shed to minimise odour generation. • Maintain bio scrubber water level within the designed operating range;
Maintenance	<ul style="list-style-type: none"> • Monthly internal inspection of the bio scrubber; • Ensure that bio scrubber water intakes do not become blocked; • Ensure that nozzles continue to function efficiently; • Ensure continued sealing of the directional vane system to enable maintenance and inspection to be carried out with fans in service; • Prevent excessive build-up of sludge within the bio scrubber water reservoirs; • Prevent excessive build-up of biosolids on the baffles and internal walls of the chambers.

Performance Indicators	<ul style="list-style-type: none"> • Monitoring results confirm plant is operating within limits. • Absence of valid complaints from members of the public.
Monitoring	<ul style="list-style-type: none"> • Odour sampling and testing in accordance with the monitoring program (section 7.2).
Corrective Action / Reporting	<ul style="list-style-type: none"> • If a complaint is received the procedure described in section 6 is to be followed. • The Operations Manager is to record any odour incidents or issues in the environmental journal

5.4 DUST

5.4.1 Design Features

The design of the plant assists to minimise any dust generation as follows:

- all roads and surfaces used for normal operations are sealed;
- dry ingredients are protected from wind by a three-sided shed;
- non-operational surfaces are either stabilised hardstand, grass or landscaping;
- the array of buildings and screening vegetation provides wind breaks to limit the effects of wind at ground level within the plant.

Mushroom substrate is a moist, fibrous substance by nature and resists mobilisation by wind.

5.4.2 Management Procedures

Substrate production is not a dusty operation by nature, hence it is not necessary to implement active dust control measures such as surface watering. Routine measures to assist in dust minimisation include:

- (i) Clean up any spillage in front of the ingredients store or elsewhere on a daily basis;
- (ii) Maintain vegetation covering over unsealed ground surfaces within the plant that are not used for vehicle or equipment storage.

5.5 ENERGY EFFICIENCY

Energy efficiency is continually practised at the substrate plant as a normal management measure for minimising the costs of substrate production. The plant uses diesel fuel, electricity and natural gas. In recent years the greatest energy efficiency

gain has been achieved by progressively developing processing techniques that have reduced the time taken to process a batch of Phase 1 substrate.

5.5.1 Design Features

Design features implemented or updated since June 2009 include:

- energy efficient Powerpax chillers complete with supervisory control system;
- variable speed drives with frequency controllers for the majority of fan and pump drives;
- power factor correction equipment;
- automated damper technology on the Phase 2/3 tunnel exhaust;
- cooling the new blocking shed cool room using chilled water from the plant chiller;
- cooling the Phase 2/3 tunnels with automatic priority for outside (fresh) water before using chilled water; and
- updating Phase 1, 2 and 3 process control monitoring.

5.5.2 Management Procedures

Management processes utilised at the plant for energy efficiency include:

- splitting the production schedule to process two batches of compost per week reducing peak electrical loads on any one day;
- Staging Phase 2/3 tunnel cool down procedures to minimise peak cooling requirements; and
- Reviewing electricity bills monthly and gas bills quarterly to monitor energy consumption.

5.6 ORGANIC MATERIALS

Organic raw materials include straw, poultry manure, cotton seed meal, cotton seed hulls and dry stable bedding. All of this material is stored under cover where it is kept dry and does not present a health risk. The quantity of materials kept on site at any time is limited by “just-in-time” system whereby delivered materials are quickly used in processing.

5.7 FUEL AND CHEMICALS

5.7.1 *Fuel*

The substrate plant stores fuel to enable machinery to be refuelled on site when required. Fuel storage and the refuelling process is managed to prevent any environmental contamination from spillage or escape of fuel.

Distillate is stored on site in below-ground tanks located near the pre-wet shed and near the emergency generator room. An above ground tank is positioned east of the new weighbridge. Mobile plant is refuelled at bowzers installed adjacent to the underground tanks. The refuelling areas are bunded to collect any spillage. A canopy over the above ground tank prevents the bunded area becoming filled with rainwater.

Clean-up equipment and materials are retained in the maintenance workshop to assist in cleaning up any spillage from within the bunded area.

5.7.2 *Chemicals*

Chemicals are not used in substrate production. The various cleaning agents, pesticides and workshop stores kept at the plant are listed on the register of dangerous goods and where relevant are stored consistent with the Dangerous Goods manifest.

5.8 MAINTENANCE

Plant maintenance takes place according to manufacturer's schedules or more frequently when repairs are needed. As far as practicable, maintenance of a particular item of equipment is scheduled to take place at times when it is not required for service. There is built in redundancy for most items of equipment so that substrate production can continue with some equipment out of service. Some spares are kept on site to enable rapid repair or changeover when required.

Elf Farm Supplies has arrangements with maintenance contractors who will service equipment around the clock if necessary to enable quick resumption of normal operations.

5.9 CONTINGENCY PLANS

Significant events that may conceivably affect the plant include flood and fire. Minor events with some repercussions include equipment breakdown and motor vehicle accidents on the internal road system.

5.9.1 Flood

The plant is constructed on a filled platform raised to 16 metres AHD to provide protection from most floods. In the period since 1981 when the plant commenced operations, flood waters have not approached this level, although Mulgrave Road has been cutoff several times. The 100 Year ARI flood level is stated by Hawkesbury City Council to be 17.3 metres AHD.

During times of minor flooding, when water levels remain below the bench height of the substrate plant, normal operations may continue. Access from the site to Hawkesbury Valley Way would not normally be affected by flood water, but should Mulgrave Road be cut off beneath the overpass, an alternate access to the east is available via the level crossing and Railway Road.

i. Priorities

Should a major flood event occur with water levels exceeding the floor of plant buildings, site operations will be disrupted. Under these circumstances the following priorities will govern actions:

- (i) safety to personnel;
- (ii) securing and protecting the plant and equipment;
- (iii) minimising pollution or other environmental damage;
- (iv) maintaining substrate production.

ii. Management Procedures

As the flood approaches:

- (i) contact suppliers to turn away any expected materials deliveries;
- (ii) dispatch as much usable substrate from the plant as possible;
- (iii) remove mobile machinery not required for emergency work, to high ground.

When the flood arrives:

- (i) shut down and de-energise electrical equipment likely to become inundated;
- (ii) close doors to all process buildings to prevent floodwater mobilising substrate;
- (iii) move small items of plant and equipment (computers) to the tunnel roof;
- (iv) evacuate staff should a threatening situation develop or when directed to do so by the State Emergency Services;

- (v) remove remainder of mobile plant to higher ground;

As flood waters recede:

- (i) test electrical circuits and re-energise when proven safe with first priority to fans and pumps;
- (ii) return mobile plant and clean deposited debris from the operational area of the site, adding suitable organic material to the pre-wet substrate and removing miscellaneous flotsam to landfill;
- (iii) separate saturated from dry ingredients and use saturated first;
- (iv) turn substrate as soon as possible to re-aerate;
- (v) clean the remainder of the site as time permits.

5.9.2 Fire

Substrate is not normally a fire risk owing to its high moisture content. Baled straw is capable of burning but fire would be retarded by the compression of the bale. About one third of the baled straw is placed in the bale wetting area where a fire could be quickly extinguished by turning on the sprinklers. The remainder is stored in the bale storage area located in the South-Eastern section of the premises. Dry ingredients may smolder in the presence of flame but are not considered a fire risk. The “just-in-time” system for ordering raw materials has reduced the quantities needed to be stored at the plant.

Potential sources of ignition include electrical equipment and mobile plant. The surrounding irrigated paddock is not considered a likely source of fire because the grass is always green and kept low by grazing stock.

i. Design Features

The following equipment and processes are in place to minimise the risk of fire:

- (i) fire hoses are installed in all work areas;
- (ii) fire hoses connected to the site’s high pressure water ring main are located near the bale storage area;
- (iii) extinguishers are kept on all mobile plant and in each work area;
- (iv) staff are trained in fire procedures;
- (v) smoking policy - smoking only in approved designated areas;
- (vi) diesel fuel is stored underground and in an above ground tank segregated from other storage and processing areas;
- (vii) the fuel dispensing area is bunded and has appropriate fire and hazard warning signs;
- (viii) weekly clean-up of loose straw from the straw bale storage area;

- (ix) designated unloading area for straw trucks;
- (x) parking of loaders a minimum of 12 meters from straw bales in the straw bale storage area;
- (xi) straw bales in the straw bale storage area to be placed a minimum of 20 meters from buildings and 12 meters from the diesel fuel tank.

ii. *Management Procedures*

Fire management strategies have been prepared for the site identifying the following matters:

- procedures to follow in the event of fire;
- alarm systems;
- equipment available on the premises for first response;
- responsibilities of personnel;
- fire brigade contact details;
- testing of firefighting equipment in accordance with Australian Standards;
- signposting for flammable storage and firefighting equipment; and
- staff training for fire emergencies.

5.9.3 *Plant Failure*

Substrate production is able to continue in the event of plant failure. *Table 5.1* indicates contingency measures that can be taken during identified abnormal operating occurrences.

Table 5.1 IDENTIFIED ABNORMAL OPERATING CONDITIONS

Condition	Response
Electricity supply failure	Automatically telecommunicated to on-call staff. If likely to be sustained, use diesel generator to supply fans.
Water supply failure	Automatically telecommunicated to on-call staff. Use stored tank water and/or town water until creek supply restored.
Exhaust fan failure	Continue with second exhaust fan until repaired
Tunnel circulating fan failure	Install replacement fan (in store). If delayed, move substrate to a vacant tunnel with working fan, or move working fan from another vacant tunnel.
Collection pit pump failure	Utilise second installed pump. Replace faulty pump as soon as possible.
Control computer failure	Each computer controls two tunnels. Set fan speeds manually. Remove substrate to other tunnels until repaired.

Conveyor failure	Move substrate by front end loader until repaired
Phase 2/3 climate plant failure	Repair the plant. Maintain air circulation without refrigeration.
Bio scrubber pump failure	There are four installed pumps. Continue to operate bio scrubber with remaining pumps. Replace faulty unit as soon as possible.
Blending machine failure	If blending machine cannot be repaired within 24 hours, turn pre-wet using front end loader.

5.10 LITTER

The raw materials used in substrate production are received with no noticeable contamination by unwanted substances. For example there is no paper or plastic entrained in the raw materials and hence there is not a problem on the site from escape of this type of litter. String used to bind straw bales is collected and placed in the waste bin when the bales are broken.

Normal housekeeping practices prevent accumulation of spilt substrate or raw materials on site. The following procedures are followed:

- (i) each day any spilt material is removed from operating surfaces of the plant;
- (ii) should any wind-blown litter enter the site, it is removed when noticed by the operator to maintain a tidy workplace.

5.11 PEST CONTROL

The plant has never experienced a problem with rodents because substrate is continually worked by machines for moving, blending or turning.

Birds are usually attracted by seeds remaining in baled straw, but are repelled by the water sprays in the bale wetting area. Dry bales of straw are kept indoors in an area inaccessible to birds.

Birds sometimes visit materials stored in the three-sided ingredients shed, seeking insects present in the ingredients. This is a limited occurrence and is not considered to constitute a pest problem.

Should a pest infestation be discovered at the plant at any time, the operator will attend to it or obtain the services of a pest exterminator.

5.12 SECURITY

The following measures are in place to maintain security of the site:

- (i) all personnel entering the site along the access road are required to report to the office;
- (ii) vehicular access to the plant from Mulgrave Road is locked at times when the plant is unattended;
- (iii) a staff member resides in the house part way along the access road and would be aware of unauthorised vehicles entering the plant out of hours;
- (iv) the operating area is surrounded by a combination of buildings and a security fence to prevent entry to the site by foot
- (v) a security alarm is telecommunicated to the on-call staff member.

5.13 WASTE MANAGEMENT

The substrate plant produces very little waste. Raw materials are fully consumed in the process, other than the bale twine binding the straw bales. Waste generated in the maintenance shed, office, staff amenities and as a result of contractors working on the plant is retained in bins that are emptied weekly. There are three 4.5 cubic metre bins that are emptied each week. Any steel and non-ferrous metal waste items are recycled via the scrap metals industry. The recycled metal bin is emptied monthly. The office paper recycling bin is emptied fortnightly.

From time to time a small surplus of substrate may be produced at the plant. This material is sent to the blocking shed where it is processed and blocked for sale. Occasionally a small quantity of unused substrate may be retained at the site as a soil conditioner for the rural property. Substrate has been used in the past to prepare the screen planting areas around the periphery of the development site. Small quantities of floor sweepings from the Phase 3 substrate building, amounting to one or two cubic metres per week, are gratefully accepted by employees for use on home gardens.

Management procedures include:

- (i) collect all waste into bins where it can be removed from the site;
- (ii) separate paper and metallic waste into recycling bins for separate collection;
- (iii) ensure all substrate is removed from the site within a week of production;
- (iv) collect any wind-blown litter from the property whenever it is noticed.

6

COMPLAINTS MANAGEMENT

6.1 OVERVIEW

This complaints management system contains the following elements:

- advertised telephone number for complaints;
- system for logging and investigating complaints;
- process for recording the outcome of investigations and action taken; and
- feedback to complainants following investigation, as required.

6.2 Introduction

Complaints will be received via the complaints telephone line (1800 155 079) or via the Elf Farm Supplies website (once operational). On receipt, complaints will be forwarded immediately to the relevant officer for investigation, and will be responded to within five business days, should the complainant request a response. This response will be provided back to complainant through their nominated choice of:

- Follow up phone call with reference number
- Email with reference number
- Letter with reference number.

6.3 Step one: receive and record the complaint

All complaints received by the complaints telephone line (and via the complaints email portal) will be recorded and the following information will be sought from the complainant:

- Personal information of the complainant – ideally their name and contact details (complaints made without personal information will still be recorded and investigated)
- Nature of complaint
- Time of complaint
- Location of complaint (to the nearest cross street, if complainant prefers not to give their exact location)
- Description of odour (character and strength), if odour complaint
- How long the odour has been present, if odour complaint
- Wind direction and other pertinent meteorological information (e.g. raining, fog, hot, wind strength), if odour complaint.

Once the complaint has been recorded the complainant will be provided with a reference number and advised of the response timeframe. In circumstances where complaints can be resolved at the point of contact, a record will be taken and the complainant will be provided with the reference number of their complaint.

6.4 Step two: investigate, assess and determine action

Once a complaint has been received and the details recorded, the complaint will be investigated and an assessment made:

- Complaint information is forwarded to the appointed officer at the time of complaint for the matter to be investigated
- For odour complaints, attendance at reported site of complaint in order to confirm the nature of odour and its source:
 - Confirmation of character and strength of odour
 - Identification of direction of odour
 - If not possible to attend (i.e. no location given, WHS requirements) the complaint is still to be investigated as per the following steps of this procedure
- Cross-reference complaint against production schedule and activities at the Elf Farm Supplies at the time of complaint and one hour preceding the complaint.
- For noise, odour and dust complaints, cross-reference complaint against meteorological conditions, including wind direction and strength at time of complaint and one hour preceding the complaint
- On the basis of the data gathered during the preceding stages, make an assessment of cause of the complaint
- Determine if corrective action is required and any contingency measures pending implementation.
- Implement contingency measures and corrective action, where required.

6.5 Step three: respond to the complaint

Once the complaint has been assessed, a formal response will be provided to the complainant, if they requested one. The EPA will also be advised of the formal response.

This response will be provided within five business days of the complaint being made and will include:

- Time and date of the complaint
- If an odour complaint, the location of the complaint
- If an odour complaint, the wind strength and direction one hour prior to complaint lodgement
- Overview of activities at Elf Farm Supplies one hour prior to complaint lodgement
- Outcomes of the assessment of the complaint.

Should the complainant be dissatisfied with the outcome of the complaint, details of other complaint options will be provided and their dissatisfaction with the outcome will be recorded.

6.6 Step four: report the complaint

Complaint data will be compiled in a complaints register to record the quantity and nature of complaints. The complaints register will be published on the Elf Farm Supplies website, and updates will be posted on the site each month.

- The register will detail:
- Number of complaints received
- Number of unique complainants where possible to identify
- Nature of complaints
- Outcomes of complaints
- If complaint was resolved in compliance with this procedure.

Reports and complaint records will be held for a period of four years after the complaint is made, as per EPA licence requirements.

6.7 Promotion of complaints telephone line

The complaints telephone line will be advertised through:

- Signage at the entry to Elf Farm Supplies Pty Ltd site (108 Mulgrave Road, Mulgrave NSW 2756)
- Telephone directory listing for Elf Farm Supplies
- Elf Farm Supplies website
- Newsletters, whilst provided
- Public information sessions, whilst conducted
- Periodic advertisements in the local print media, whilst provided.

ENVIRONMENTAL MONITORING

7.1 MONITORING PROGRAM

The environmental performance of the plant will be monitored in accordance with the project approval and environment protection licence. Monitoring is specifically required for odour, noise and energy efficiency and will be carried out as detailed in this section. Wind monitoring is ongoing.

The results of monitoring will be documented and retained at the plant office. If monitoring identifies any non-conformances, a corrective action strategy is to be implemented and recorded with the monitoring records.

7.2 ODOUR MONITORING

i. Location

Odour emissions are monitored at the existing chimney stack and will be similarly monitored in the second stack when it is commissioned. Samples of exhaust air are collected from the highest practicable location within the chimney to represent as closely as possible the air exhausted to atmosphere.

ii. Method

Odour emission sampling and analysis is carried out for a minimum of one hour duration in accordance with the EPA publication “*Approved Methods for the Sampling and Analysis of Air Pollutants in NSW*”, July 2001

iii. Frequency

Odour sampling and analysis is undertaken every six months.

iv. Performance Target

The performance target is the in-stack emission limit specified in environment protection licence 6229 issued by the EPA.

The performance target is **55,400 odour unit cubic metres per second** and applies to a one hour duration odour evaluated as a rolling annual average.

When the second chimney is commissioned, it is anticipated the EPA will re-issue the licence specifying that the limit will apply to the aggregate emissions from both stacks.

v. Review

As specified in the licence, compliance with the performance target is determined by sampling on a six-monthly basis and calculating a rolling average. This process makes some allowance for the variability of source emissions during the weekly production cycle and the inherent level of uncertainty in odour measurement. One reading in excess of the performance target is not to be taken as indicative that the plant is exceeding its licence limits.

The Managing Director and Operations Manager will examine each six-monthly test result, compare it with previous results, look for any trends and calculate the rolling average. Should results indicate declining performance or non-compliance, the reasons will be explored and appropriate action taken. Duplicate or follow-up odour sampling and analysis may be undertaken to confirm the validity of any suspect results or to test the effectiveness of corrective action.

7.3 NOISE MONITORING

i. Location

Noise measurements are to be taken in the near field (close to the source) and at two reference locations consistent with the closest residential receivers identified in the operational noise management plan (*Appendix D*), Chisholm Place to the west and Railway Road/126 Mulgrave Road to the south east. Where access to an identified receptor is not available an alternative location representative of the receptor will be used.

ii. *Method*

Measurements will be taken with sound level meters attended by an operator. Near field measurements are to be taken during the day. Measurements at receptors are to be taken at night. Relevant procedures and exemptions (including certain meteorological conditions) of the *NSW Industrial Noise Policy* will apply.

iii. *Frequency*

Noise monitoring is to take place within six months of completion of construction work associated with each stage of the development. Further noise monitoring will only be required if there are exceedences or a significant change to operations or plant and equipment likely to have noise implications.

iv. *Performance Targets*

Near field measurements will confirm that noise emissions from the plant, attenuated by building structures, are not above the levels assumed for modelling purposes by Atkins Acoustics in the noise management plan (*Appendix D*).

At night time the plant should either be inaudible or make no significant contribution to the background noise at the receptor locations. The operator verifies audibility of the plant when the measurements are taken. Specific limits from the project approval (Schedule 3, Condition 19) are as follows:

Receiver/Location	Day/Evening dB(A) L_{Aeq} (15 minute)	Night dB(A) L_{Aeq} (15 minute)
R1 – 48 Mulgrave Road, Mulgrave	42	42
R2 – Mulgrave industrial area		
R3 – 2 Railway Road, Mulgrave		
R4 – 126 Mulgrave Road	44	39
R5 – Chisholm Place, Windsor		

The environment protection licence specifies L_{Aeq} (15 minute) limits at the most affected residence of 44 dB(A) during the day and evening and 39 dB(A) at night.

v. *Review*

After each noise monitoring occasion, the Managing Director and Operations Manager will examine the noise audit report, compare it with previous results and look for any trends.

Should results indicate non-compliance or declining performance, the reasons will be explored and appropriate corrective action taken. Follow-up noise monitoring may be undertaken to confirm the validity of any suspect results or to test the effectiveness of corrective action.

7.4 WIND MONITORING

Hourly wind data has been recorded at the plant for more than a decade. There are two wind monitors at the plant. Collected data has been used to provide inputs for modelling and to respond to any complaints.

7.5 ENERGY EFFICIENCY MONITORING

Electricity bills are reviewed monthly and gas bills quarterly. Total energy consumption data is compiled annually and reviewed against production data. Should a decline in energy efficiency be revealed, the reason for the decline will be investigated, having regard to the introduction of new plant included in the staged expansion.

Should the investigation reveal that part of the process is becoming less energy efficient, potential improvements will be considered and implemented if cost effective. Should the investigation reveal that part of the process is becoming less energy efficient, potential improvements will be considered and implemented if cost effective.

REPORTING AND REVIEW

8.1 REPORTING

8.1.1 *Record Keeping*

Any record or document required to be kept by this EMS must be kept at the plant office. The document should be available for examination by an authorised person from a relevant government agency.

A copy of the EMS must be kept in the plant office so that it is readily accessible to operational staff.

8.1.2 *Documentation*

In addition to maintaining the complaints register and monitoring results, the following documentation is to be retained to record compliance with the EMS.

i. *Environmental Journal*

The Operations Manager is to keep an environmental journal where any observations or issues are to be recorded. Such information will include:

- any unusual occurrences that may have environmental implications;
- any inspections or monitoring undertaken in accordance with this EMS;
- any corrective action that has been undertaken;
- any environmental incidents (see ii below); and
- any other relevant observations.

ii. *Record of Environmental Incidents*

The Operations Manager is to document any environmental incidents that occur. The following information is to be recorded in the environmental journal, where applicable:

- the location of the incident;

- the name and telephone number of the person reporting the incident;
- the time of incident;
- the suspected cause of the incident;
- the environmental harm and/or environmental nuisance caused, threatened or suspected to be caused by the incident; and
- action taken to prevent any further occurrence and mitigate any environmental harm and/or nuisance caused by the incident.

Incidents are required to be notified in accordance with 8.1.3 below.

iii. Corrective Action Statements

When recording a non-conformance from environmental monitoring or any non-compliance with statutory requirements, a separate statement shall be written for each system problem identified. The corrective action statement shall comprise four elements:

- objective evidence – the precise observation of the non-conformance;
- reference – to the specific section of the environmental documentation;
- explanation – why the non-conformance occurred or why the documentation is deficient; and
- action required – to alleviate the non-conformance or amend the documentation.

8.1.3 Notifications of Emergencies and Incidents

As soon as practicable after becoming aware of any emergency or incident which results in harm to the environment, personnel or property, the Director-General and any other relevant agency must be notified and provided with details encompassing the same information as that included in the environmental journal, described in section 8.1.2 above.

Within seven days of the initial notification a detailed report of the incident must be given to the Director-General and any other relevant agency (project approval: schedule 5 condition 5).

8.2 REVIEW

8.2.1 *Environmental Performance Review*

Condition 3 of Schedule 5 of the project approval specifies requirements for reviewing environmental performance of the substrate plant. The first review is due one year after production first exceeds 1,000 tonnes per week in accordance with an approval issued by the Director-General. A further review is required every three years after that. The review is required to contain the following information:

- a) *describe the operations that were carried out in the past year.*
- b) *analyse the monitoring results and complaints records of the Project over the past year which includes a comparison of these results against the*
 - *relevant statutory requirements, limits or performance measures/criteria;*
 - *monitoring results of previous years; and*
 - *relevant predictions in the EA;*
- c) *identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;*
- d) *identify any trends in the monitoring data over the life of the Project; and*
- e) *describe what measure will be implemented over the next year to improve the environmental performance of the Project.”*

The report of the review is to be submitted to the Director-General as soon as possible after the review is complete.

8.2.2 *EMS Review*

This EMS (including any sub-plan) may be reviewed at any time to suit the needs of the Project. In compliance with condition 4 of Schedule 5 of the project approval, the document shall be reviewed within three months of any of the following:

- submission of any incident report referred to in section 8.1.3 above; and
- completion of a three-yearly review of the environmental performance of the approved project as a whole referred to in section 8.2.1 above.

A record shall be kept that the review has taken place. If a review determines that the EMS requires amendment, the approval of the Director-General is to be obtained before the amended EMS is brought into effect.