ELF FARM SUPPLIES PTY LTD

MUSHROOM SUBSTRATE PLANT

Modification to Approved Project

Environmental Assessment

Perram & Partners

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Report 136R2

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EXECUTIVE SUMMARY

Elf Farm Supplies operates a mushroom substrate production plant at 108 Mulgrave Road, Mulgrave. In 2012, the Minister for Planning granted approval to further develop the plant and for staged increase in substrate production. The company is now applying for a modification to the project approval to enable introduction of newer technology in substrate production and odour management.

In summary, the purpose of the modification is to change the method of processing substrate in the pre-wet stage, to improve the technology and capability of the odour management system and other changes to improve the quality of substrate produced. The modification will progress the environmental performance of the plant to comply with its Environment Protection Licence (EPL 6229).

Alteration to proposed building work includes erecting a tunnel structure for pre-wet processing in lieu of the large shed previously proposed. Ammonia scrubbers and a biofilter will be installed in lieu of the approved bioscrubber and chimney. The length of the existing building used for Phase 2/3 processing will be increased by about nine per cent. Various air ducts and conveyors will be installed to enable the additions to function. Other storage and operating areas will be placed entirely indoors to enable improved capture and treatment of air emissions.

The new pre-wet tunnel structure will have a similar plan area and height to the buildings it will replace. The biofilter will be a swimming pool like structure extending about 2 metres above ground level.

The odour management system is being altered to improve the environmental performance of the plant. Exhaust air will be collected from various locations and ducted to the new emissions treatment plant with the aim of capturing all potentially significant sources and substantially reducing fugitive emissions. The odour management system will be installed as an initial stage to enable the majority of these improvements to be achieved as soon as possible.

An odour assessment concludes that the proposed modifications when complete will result in a highly significant reduction to existing odour emissions and impact profile. Furthermore, the air output from the biofilter will be of a treated quality and will not have the character of the untreated process air.

An acoustic report indicates that detailed design of the works will ensure noise from the altered plant will be constrained to remain within the limits contained in the current approval and licence.

1
INTRODUCTION

1.1 PURPOSE OF THE REPORT

This report has been prepared to accompany an application to the Department of Planning and Environment to modify approved development works and operations at Elf Farm Supplies' mushroom substrate plant at 108 Mulgrave Road, Mulgrave. *Figure 1* shows the location of the substrate plant.

The relevant approval was granted to Elf Farm Supplies by the Minister for Planning on 11 January 2012 under Part 3A of the Environmental Planning and Assessment Act. It permits Elf Farm Supplies to further develop the company's mushroom substrate plant at Mulgrave; and for staged increase in substrate production. The current application seeks to modify that approval under section 75W of the Act[1].

In the period since the project approval was granted the company has submitted environmental plans and strategies, receiving further approval to commence construction work and to increase production to 1,600 tonnes of substrate per week. Some of the staged construction work has been completed and the plant output has been increased.

The company has continued to monitor worldwide developments in mushroom substrate production including odour control and now seeks to introduce newer technology to the Mulgrave facility. As the newer technology involves an alteration to building plans and method of operation, a modification to the project approval is needed before proceeding to the next stage of construction.

This role of this report is to describe and assess the proposed modification to the project approval and its environmental impact. It is not a re-assessment of the approved development as a whole. Reference should be made to the original environmental assessment for the Part 3A project (Perram & Partners 2010) for description and assessment of aspects of the approved project that are unaffected by the proposed modification.

[1] Although Part 3A has been repealed, its provisions remain in force with respect to existing approvals issued under that Part.

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FIGURE 1 Mulgrave Substrate Plant

1.2 DEPT OF PLANNING AND ENVIRONMENT REQUIREMENTS

The Department of Planning and Environment has advised requirements for this environmental assessment as follows:

- detailed description of the existing or ongoing operations and photographs of the existing operations;
- site plans including the modifications to the existing or approved building works;
- the need for the modification application having particular regard to current odour issues;
- alternatives considered;
- likely changes to any approved staging of the development - including construction and operational stage/s;
- likely interactions between the modified Project and existing, approved and proposed operations in the vicinity of the site;
- clear identification of any changes to the approved project in terms of environmental impact i.e. noise , wastewater, stormwater.
- proposed amendments to existing conditions of approval and environmental management and monitoring measures

In addition the Department has enclosed requirements for the assessment received from the EPA. The letter from the EPA summarises the following key issues:

1. Air quality (including dust, odour, other air emissions assessment modelling and management);
2. Noise impact (including noise assessment modelling and mitigation);
3. Waste acceptance, storage, processing, reuse, management and disposal;
4. Description of outputs from process, ie (type, volume etc); and
5. Surface water and waste water management, (including surface water controls and impacts on waterways and water supply).

The EPA has also attached generic requirements for an operation of this type that have been considered where they apply to the proposed modification.

Correspondence from the Department including its requirements and EPA requirements are included as *Appendix A*.

The matters listed by the Department of Planning and Environment for inclusion in the environmental assessment are set out in *Table 1.1* together with a response or direction to where the matter is addressed in the environmental assessment.

Table 1.1 RESPONSE TO DOPE REQUIREMENTS

DOPE Requirement	Response
• detailed description of the existing or ongoing operations and photographs of the existing operations;	Please refer to *Appendix D*.
• site plans including the modifications to the existing or approved building works;	Please refer to figures 2 to 7.
• the need for the modification application having particular regard to current odour issues;	Please refer to section 1.4
• alternatives considered;	Please refer to section 1.5
• likely changes to any approved staging of the development - including construction and operational stage/s;	Please refer to section 2.2.2. Staging will essentially remain as approved, except that the modified odour management system will be progressively commissioned ahead of final Stage 2 works as a separate sub-stage.
• likely interactions between the modified Project and existing, approved and proposed operations in the vicinity of the site;	No such interactions have been identified. There are no relevant proposed operations identified on the DoPE major project list.
• clear identification of any changes to the approved project in terms of environmental impact i.e. noise , wastewater, stormwater.	Please refer to section 3. A primary purpose of the modification is to enable better odour management, hence the effect of the change will be to reduce environmental impact and comply with the EPL.
• proposed amendments to existing conditions of approval and environmental management and monitoring measures	1. It is proposed is that condition 2 of schedule 2 be amended to refer to this EA as amending the 2010 EA currently referred to in the condition. 2 A further condition would require that detailed design of the modified works is to be undertaken in conjunction with an qualified acoustic consultant to verify that existing licence conditions will be met. 3. Condition 3 of Schedule 3 refers to the Environment Protection Licence. The EPL may require review to incorporate the new odour management system

The key issues identified by the EPA are summarised in *Table 1.2* together with a response.

Table 1.2 RESPONSE TO EPA 'KEY ISSUES'

EPA Requirement	Response
• Air quality (including dust, odour, other air emissions assessment modelling and management);	Please refer to section 3 and *Appendix C*.
• Noise impact (including noise assessment modelling and mitigation);	Please refer to section 3 and *Appendix B*.
• the need for the modification application having particular regard to current odour issues;	Please refer to section 1.4
• Waste acceptance, storage, processing, reuse, management and disposal;	Please refer to section 3. The application does not propose any change to the current approval with regard to waste.
• Description of outputs from process, ie (type, volume etc); and	Please refer to section 3 and *Appendix D*. The application does not propose any change to the current approval with regard to production outputs.
• Surface water and waste water management, (including surface water controls and impacts on waterways and water supply).	Please refer to section 3. The application does not propose any change to the current approval with regard to surface water, waste water, or effect on water supply and waterways.

1.3 SITE PLAN

Figure 2 is a layout plan of the site showing the outline of existing structures and approved structures as yet not constructed.

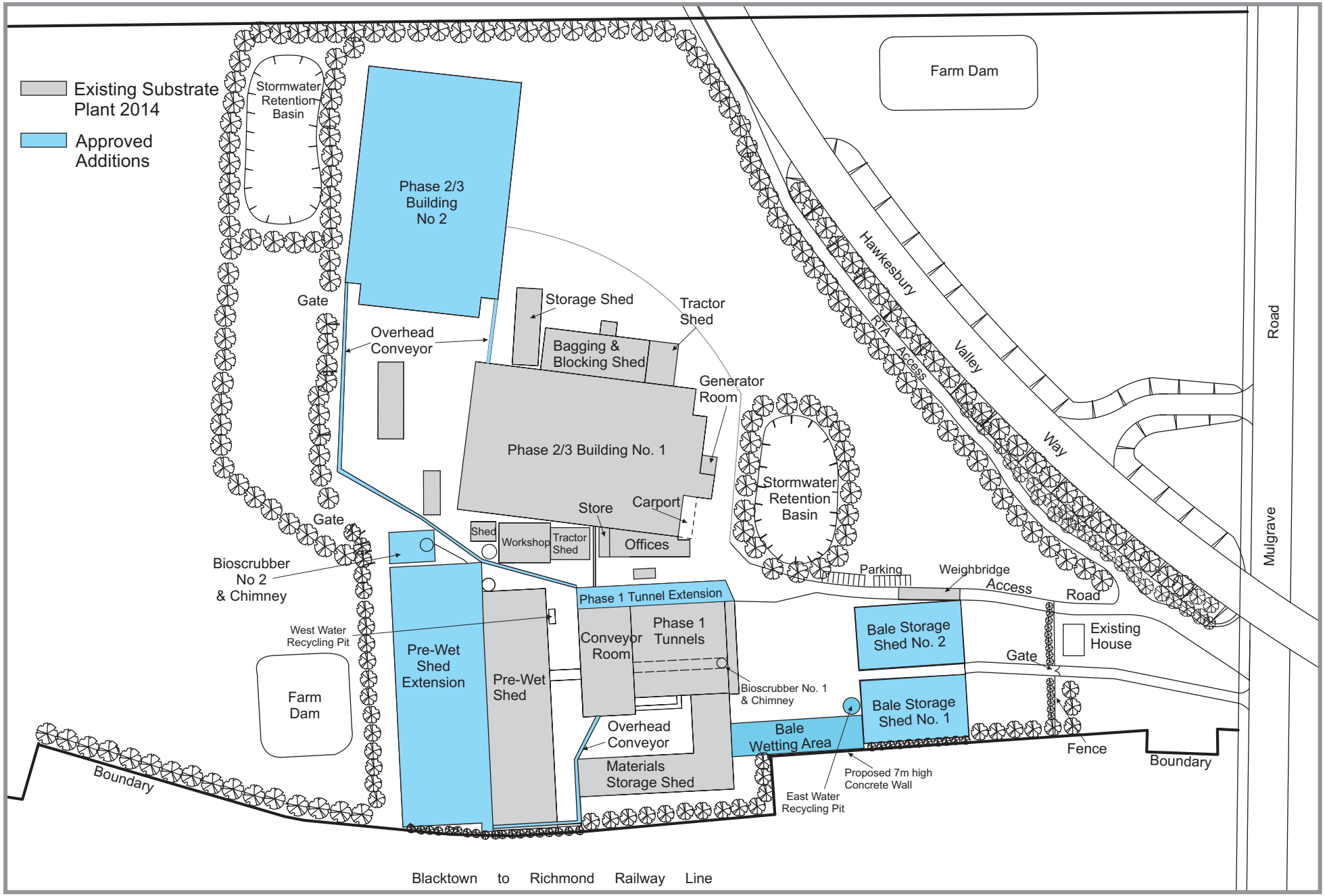

FIGURE 2 Existing and Approved Development

1.4 PURPOSE OF THE PLANT ALTERATIONS

There are several reasons for proposing alterations to the approved pre-wet and odour control process:

- As foreshadowed in the environmental assessment that accompanied the project application (Perram & Partners 2010), Elf Farm Supplies has continued to monitor worldwide technological improvements in mushroom substrate production and odour management. Developments, particularly in Western Europe, have now demonstrated that ammonia scrubbers and biofilter beds are more effective at odour removal from substrate processing than bioscrubbers;
- Elf Farm Supplies has also been developing and trialling alternative processes to permit the pre-wet stage of composting to be effectively undertaken in enclosed bunkers. This development work has been critical to obtaining more effective odour control during the pre-wet stage than trying to exhaust and treat considerable volumes of air from a large shed;
- The Mulgrave substrate plant operates under an environment protection licence issued by the EPA. Elf Farm Supplies routinely monitors odour in the substrate plant chimney consistent with its licence. Routine sampling from the chimney has shown that the plant continues to operate below the odour limit specified in the licence.

  However, there has been community unrest, particularly since January 2013, with regard to odour from all sources in the Mulgrave area. Both the EPA and Elf Farm Supplies have responded to the concerns. The company has undertaken a number of repair and modification projects to the existing plant in conjunction with operational procedure changes. A July 2014 odour survey undertaken by the EPA has resulted in further improvements being required to prevent fugitive emissions from the plant, being air that escapes from non-treated sources such as through doors and vents, rather than through the chimney; and
- The approved Odour Management Plan for the site (Todoroski Air Sciences 2012) requires that consideration be given to reducing fugitive emissions by enclosing the bale wetting area and optimising the time taken and efficiency of transporting pre-wet material to the Phase 1 tunnels (section 4.2.1).

Elf Farm Supplies now requests approval to embrace the recent technological improvements as part of its action to control fugitive emissions. Fugitive emissions are controlled by sealing air escape paths and enclosing all processing operations. In the case of pre-wet processing, the requirement to effectively exhaust the significant volume of air from a large pre-wet shed so as to maintain the building under negative pressure is challenging for both engineering design and operational management.

It is therefore proposed to move to enclosed bunker or tunnel processing for the pre-wet stage of substrate production. This enables a smaller volume of air to be treated from each batch of material with a more efficient odour removal system. Elf Farm Supplies has experience with tunnel processing as this method has been successfully used at Mulgrave for Phase 1 composting for about two decades. Ammonia scrubbers and a biofilter will replace the previously proposed second bioscrubber and chimney and over time will allow the existing bioscrubber to be decommissioned and mothballed.

The proposed changes will result in all process operations, including the transfer of compost material throughout the plant, to be undertaken in enclosed buildings and covered conveyors. This will result in Elf Farm Supplies being able to minimise all significant sources of fugitive emissions.

With the construction of new pre-wet tunnels, the existing pre-wet shed will become redundant for this purpose and would allow the bale wetting and stable bedding operations to be carried out indoors, further reducing the potential for fugitive emissions.

A minor extension to the Phase 2/3 processing building is also proposed for the reason that it will enable substrate to have a longer residence time in Phase 2 and Phase 3 processing, which has been demonstrated to produce a higher yield and better quality mushrooms.

1.5 ALTERNATIVES CONSIDERED

As an alternative to seeking modification to the project approval, Elf Farm Supplies has considered proceeding with the next stage of development of the substrate plant as currently approved. While this is a cheaper solution in terms of construction and operational costs, the company would prefer to proceed with the proposed alterations for the following reasons:

- the proposed changes to pre-wet processing and emissions control give greater certainty that EPA concerns regarding fugitive emissions can be effectively addressed;

- tunnel processing for pre-wet will give greater consistency and control over product quality;
- successful implementation will demonstrate that the plant can move forward to increase production;
- the company is committed to a process of continuous improvement at the substrate plant including monitoring and where practicable, implementing the latest advances worldwide in substrate production technology. This commitment is included in section 8.2 of the environmental assessment accompanying the original project application (Perram & Partners 2010) and section 5 of the Odour Management Plan (Todoroski Air Sciences 2012).

2
PROPOSED MODIFICATION

2.1 OVERVIEW

Elf Farm Supplies requests the Minister to modify the project approval to allow for the following alterations:

- construct and utilise tunnels for the pre-wet phase of substrate production, instead of constructing and utilising for this purpose the approved large shed,
- construct the approved second emissions treatment plant to a new design incorporating ammonia scrubbers and biofilter, instead of constructing a second bioscrubber and second chimney;
- install extraction ductwork to extract air from various operating areas of the plant and deliver it to the new emissions treatment plant;
- enclose the raw materials courtyard to contain chicken manure dust and enable controlled air extraction from this area;
- extend the existing Phase 2/3 building from 22 to 25 tunnels (approximately 10 metres on its western side) to allow a longer residence time for the substrate in Phase 2/3 processing; and
- Other minor consequential changes to approved structures and operations.

Details of these alterations and related changes to operations are provided in the following sections.

2.2 BUILDING ALTERATIONS

2.2.1 Approved Pre-wet Shed and Bioscrubber

The 2012 project approval included construction of a second larger shed for pre-wet processing. The new building was designed to share a common wall with the existing pre-wet shed. It was to be larger than the existing shed being 133 metres long by 45 metres wide and had a wall height of eight metres with a pitched roof extending to approximately 12.6 metres above ground. The lower two metre section of the external walls was to be of concrete with a combination of metal sheeting and clear panel above.

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FIGURE 3 Proposed Pre-Wet Structure and Biofilter

The approved second emissions treatment plant was to be a separate stand-alone bioscrubber measuring 22 by 15 metres in plan and nine metres high. The building had concrete walls and a flat concrete roof. A chimney was to be erected on the roof of the bioscrubber with a diameter of 1.8 metres at the base extending to a height of 40 metres above ground.

The total plan area of these approved structures was approximately 6,300 square metres. It is now proposed that neither of these structures will be erected. *Figure 3* shows the outline of the currently approved pre-wet shed and bioscrubber upon which is overlayed the footprint of the pre-wet tunnel structure and biofilter now proposed.

2.2.2 Proposed Tunnel Structure

In the location where the second pre-wet shed and bioscrubber would have been constructed, it is now proposed to erect a concrete structure to permit pre-wet processing to take place in tunnels. The proposed pre-wet tunnel structure will have similar characteristics to an existing tunnel structure on the site, part of which has been in use for approximately two decades. The existing tunnel structure is used for a later stage in substrate preparation referred to as "Phase 1" processing.

The design provides for 10 pre-wet tunnels, each 50 metres long and eight metres wide. Tunnels will be arranged in a bank of six at the southern end and four at the northern end and will be constructed in stages. The tunnels will open into a centrally located working hall. At each end of the structure a plant room will enclose machinery including fans, pumps, ammonia scrubbers and tanks. A four metre wide service corridor along the eastern side of the tunnel structure adjoining the existing pre-wet building will house a conveyor and miscellaneous rooms for storage and operations. *Figure 4* shows the internal layout of the new pre-wet structure.

The tunnels will be constructed of reinforced concrete with a concrete roof. The working hall external walls will be of concrete in the lower section and a combination of metal sheeting and clear panel above. The roof will be metal clad. The plant rooms at the ends of the structure will have external walls of concrete and concrete blockwork.

The tunnel structure will have a total floor area of approximately 6,500 square metres, comparable with the area of the superseded buildings. The height of the tunnels will be approximately eight metres to a flat roof, with a section of pitched roof over the work room extending to about 13 metres. A rooftop conveyor will create a linear height extension across the centre of each bank of tunnels. *Figure 5* shows west and south elevations of the proposed new pre-wet structure.

FIGURE 4 Internal Layout of Proposed Pre-Wet Structure

2.2.3 *Proposed Biofilter*

The biofilter will occupy an area of approximately 2,800 square metres. It will have the form of a large open swimming pool type structure with concrete sides extending approximately two metres above ground level. Ductwork, partly above and partly below ground, will convey exhaust air from the ammonia scrubbers and distribute it across the base of the biofilter structure. The biofilter will be filled with organic material including shredded tree stumps, trunks and bark. Grasses may colonise the surface of this structure.

Rainfall draining through to the base of the biofilter will be directed to the water recycling pit, from where the water will be reused in the substrate production process.

The biofilter and emissions plant have been sized with sufficient capacity to receive extracted air from all parts of the operation. A second biofilter area has been nominated to allow an increase in air treatment capacity if required (see *Figure 7*).

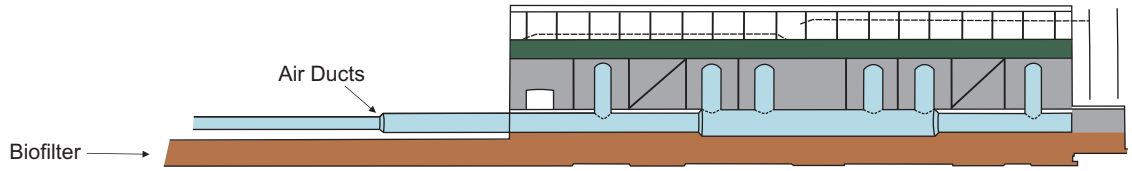
2.2.4 *Phase 2/3 Building Extension*

The Phase 2/3 building was a pre-existing structure at the time of the 2010 project approval. The building was not altered as a result of that approval, except for a small generator room added to its eastern end. The building is approximately 114 metres long by 73 metres wide. It is now proposed to extend the building from its western end by approximately 10 metres, less than nine per cent of its existing length. This extension will enable an additional three Phase 2/3 tunnels to provide 25 tunnels where there are now 22. *Figure 7* shows the proposed extension.

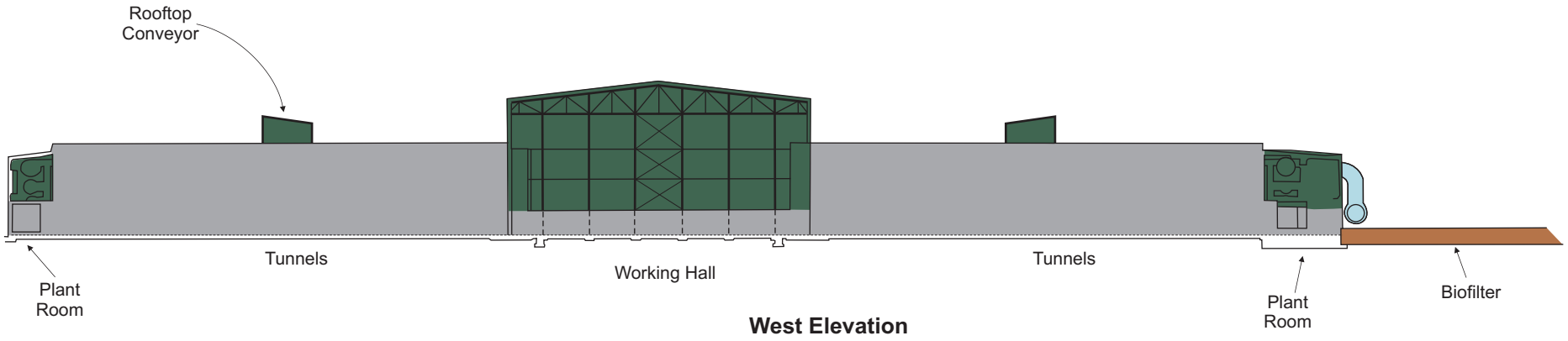
The additional tunnels will allow a longer "residence time" of substrate in the tunnels. It is planned to leave each batch of substrate in Phase 2 processing (pasteurising) for six days instead of the planned five days and support three more days for Phase 3 processing (spawn running). Testing has shown that the additional processing time results in a higher yield and improved quality of mushrooms at the growing farms.

2.2.5 *Other Alterations*

As a consequence of introducing tunnel processing for pre-wet material, the existing pre-wet shed will become redundant for this purpose. It is planned to decommission the existing outdoor bale wetting and stable bedding area and undertake these operations in the existing pre-wet shed. The approved second external bale wetting area and associated water recycling pit on the eastern side of the site will therefore not be required. A straw bale breaking line will also be included in the pre-wet shed.



South Elevation



West Elevation

FIGURE 5 Elevations

The raw materials storage area and courtyard will be further enclosed to contain chicken manure dust and be fitted with air extraction. Deliveries and manure processing will occur within the enclosed space. There will be an internal connection from this area to the existing pre-wet shed to end the use of loaders externally transporting chicken manure between buildings for blending.

Extraction ductwork is to be installed from all current and future operating areas to deliver all extracted air to the proposed new emissions plant and biofilter. *Figure 7* shows the general location of proposed ductwork.

Cooling towers will regulate the exhaust air temperature in the ammonia scrubbers and recycle the heat energy back into the two working halls to supply makeup air and improve operator working conditions.

The site drainage system will not require further modification as the new pre-wet structure will be a replacement for the previously approved shed and bioscrubber with a similar roof area.

The existing approved development includes installation of several new conveyors. The proposed alterations will require rearrangement of approved conveyors and some new conveyors. New conveyors proposed with the new pre-wet structure will primarily be internal to the building except for the rising connections to the tunnel rooftop.

All external conveyors will be enclosed to prevent fugitive emissions.

2.3 CONSTRUCTION

Except as described below, construction staging will essentially be as presented in the 2010 environmental assessment, Site filling operations for the approved development works are largely complete except for a minor extension required to provide a level base for the biofilter.

Staging of construction works will be amended to enable the new emissions management plant to enter service as soon as possible. The plant room, services corridor, biofilter and associated ductwork and mechanical fitout will be installed as a priority. These initial building works are shown shaded on *Figure 6*.

After the emissions plant is in service, the southern bank of six pre-wet tunnels will be completed and placed in service. This will release the existing pre-wet shed to enable consequential works and improvements to be completed.

It is anticipated the northern bank of four pre-wet tunnels will be constructed as a separate sub-stage after any approval to increase production.

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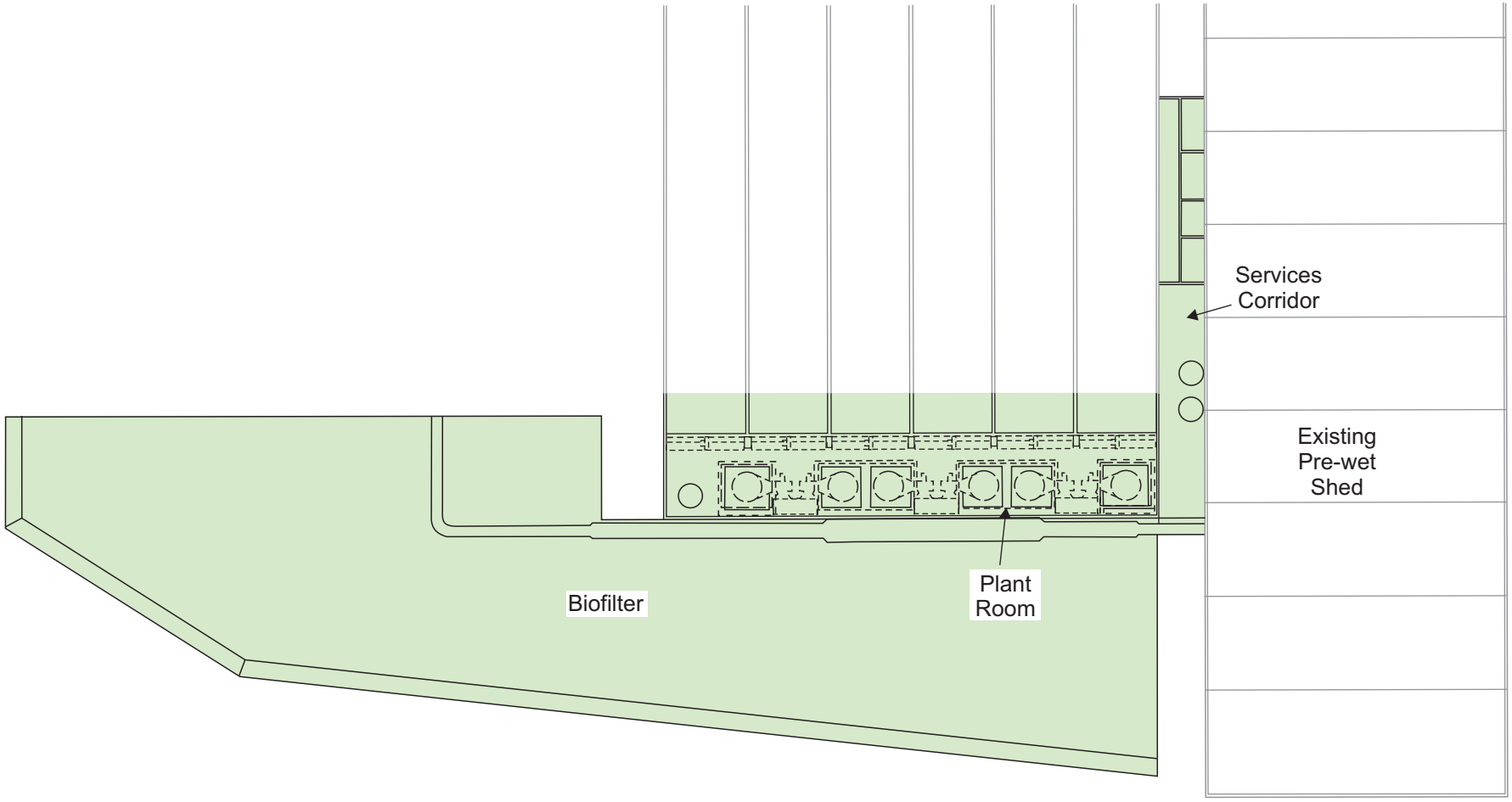

Figure 6 Early Construction for Ammonia Scrubbers and Biofilter

2.4 TECHNOLOGY

Pre-wet tunnels will use similar technology to the existing Phase 1 tunnels, including:

- an 'air under' system to introduce air to the mix through the tunnel floor;
- conveyor loading of tunnels to ensure even distribution of composting material;
- 'walking floor' hoppers in the working hall to assist material movement;
- variable speed fans regulating air flow to and from the tunnels; and
- an automated management system controlling the pre-wet process.

Ammonia scrubbers and associated heat exchangers treat and cool the exhaust air. Circulating liquid is continuously sprayed into the exhaust air stream passing through to the biofilter. The liquid has acid dosing as required to maintain the correct pH. Ammonium sulphate solution is created as part of the neutralising reaction which is recovered either for re-use in the composting process or sale as a fertilizer.

The biofilter is essentially a concrete structure similar in form to an above-ground swimming pool. An extensive duct network transfers exhaust air from the plant to the base of the biofilter and enables an even distribution throughout the biofilter.

2.5 OPERATIONS

The pre-wet operation will be carried out entirely indoors, with loaders operating in the working hall to collect material from the tunnels and deposit it in walking floor hoppers for addition of water and transfer via conveyor either back to tunnels or to the next stage of processing.

There is currently an enclosed vehicular corridor linking the pre-wet building to the Phase 1 building. The proposed modifications will eventually eliminate the need for loaders to pass through the corridor with pre-wet material as part of the normal transfer operation.

Up to 20 kilolitres of sulphuric acid will be stored in tanks beside the ammonia scrubbers. It is anticipated this storage will require replenishment approximately every three months.

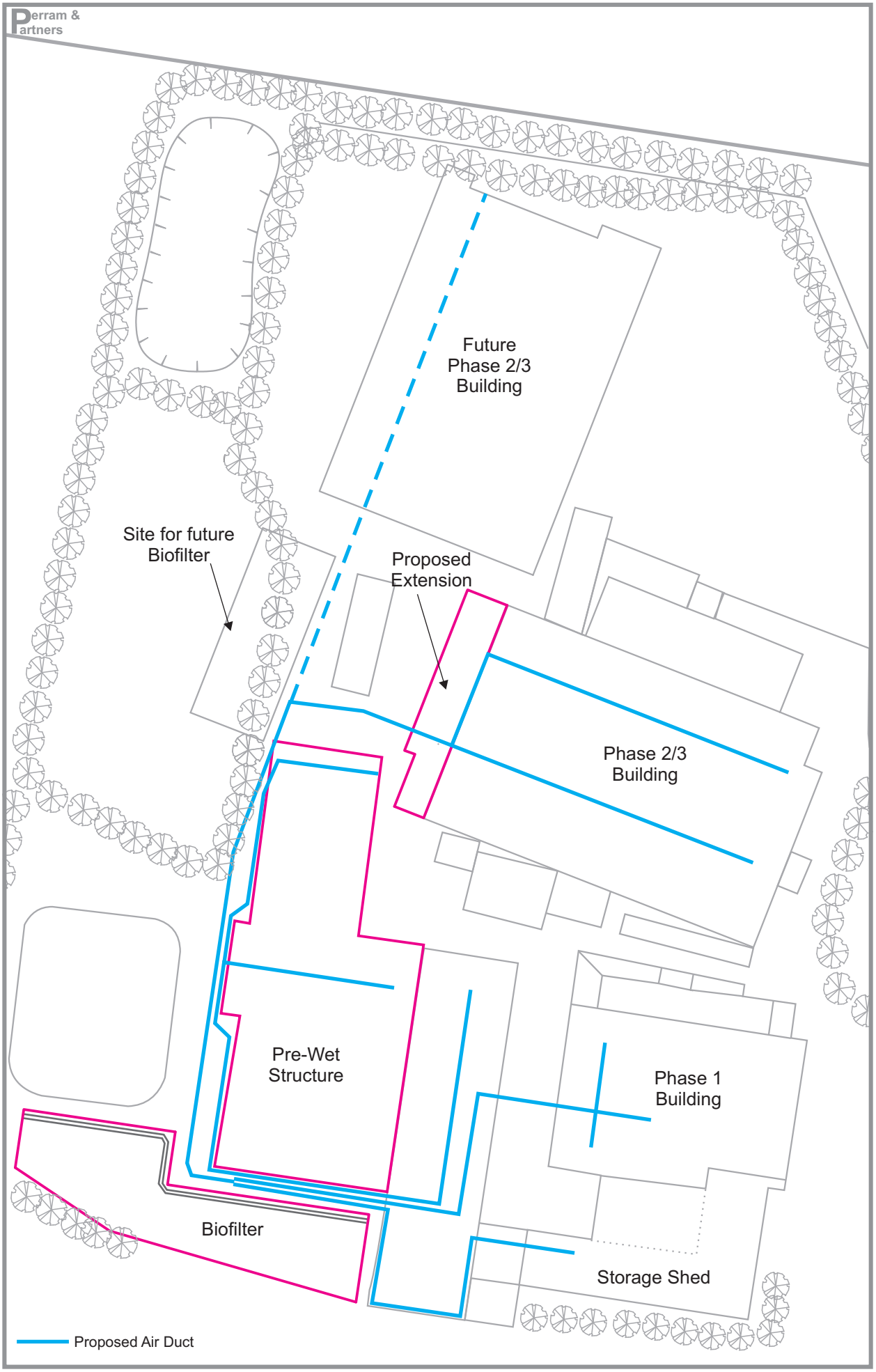

Figure 7 Proposed Air Ducts

To assist the biofilter to function correctly the fill material must be kept moist. In dry periods water sprays will be used to maintain minimum moisture levels in the biofilter.

Computer-managed controls will automatically regulate conditions the emissions control equipment in the plant processing areas and monitor ammonia scrubber operation to provide alarm notifications.

After the emissions control system is fully commissioned and its performance tuned, it is expected that the existing bioscrubber can be decommissioned and retained as a standby system.

3
ENVIRONMENTAL ASSESSMENT

3.1 VISUAL IMPACT

The proposed alterations to the plant will result in a minor change in building form. The pre-wet tunnel structure will have a similar footprint with a similar bulk to the currently approved shed and bioscrubber. The most significant change from a visual perspective is that the second chimney will not be required. The 10 metre extended section of the Phase 2/3 building will be of minor visual significance. The new end wall will be of similar appearance to the existing end wall.

Being just above ground level, the biofilter will have limited visibility and visual impact.

3.2 WATER MANAGEMENT

3.2.1 Process Water

All process water including wash-down water is fully consumed in substrate production. In wet weather rainfall runoff from operational areas drains to the water recycling pit from where it is used for bale wetting or for addition to composting material. The proposed alterations will not change this arrangement, except that it is expected there will be less runoff to the pit. Factors reducing runoff to the pit include:

- placing a roof over the courtyard of the raw materials storage; and
- conducting bale wetting indoors and hence avoiding the need for the second outdoor bale wetting area on the eastern side of the plant.

However the pit will receive some additional input from rainfall draining through the biofilter that will flow to the existing water recycling pit.

When bale wetting moves indoors it will continue to circulate water through the existing water recycling pit.

3.2.2 Stormwater

The stormwater system for the substrate plant and its approved expansion was designed by Barker Ryan Stewart (Perram & Partners 2010). In accordance with the approved design:

- roof water from various structures (current and future) is directed either to South Creek or farm dams. In the latter case it is stored for use on the rural property, or in substrate production, as required;
- surface water from non-operational areas of the site such as hardstand is collected in retention basins and also diverted to farm dams via reed beds;
- rainfall runoff from dirty operational areas flows to the water recycle pit from which it is extracted for use in the production process.

The proposed building alterations will create some additional roofed area beyond that already approved, primarily from the proposed extension of the Phase 2/3 building. Roof water from this building and its extension will continue to flow to South Creek.

3.2.3 Wastewater

The process of neutralising ammonia will create ammonium sulphate, dissolved in the circulating water of the ammonia scrubbers. To control the concentration of ammonium sulphate, circulating water will periodically be drawn from the ammonia scrubbers and mixed with process water added to the pre-wet material or sold to the agricultural industry as a fertiizer.

Hence there will be no wastewater generated from the ammonia scrubbers.

The only wastewater generated on the site will continue to be from staff amenities, which is discharged to sewer.

3.3 HAZARDOUS MATERIAL

Up to 20 kilolitres of sulphuric acid will be stored for use in the ammonia scrubbers. The acid will be in tanks in the plant rooms and arranged in accordance with relevant Australian Standards for storage of this material.

3.4 TRANSPORT

The proposed modification will not significantly affect the number of vehicles accessing the site. The construction phase for the pre-wet facility will extend because concrete tunnels are more complex structure than the currently approved pre-wet shed. Operational traffic will be largely unchanged.

3.5 NOISE

Noise emissions will be constrained to remain within existing licence limits. Detailed design of the alterations will be undertaken with input from an acoustic specialist to ensure that adequate attenuation is installed for the selected plant. This work will be undertaken as the plant's detailed designs are prepared and finalised.

Appendix B contains a preliminary acoustic review from the acoustic consultant.

3.6 ODOUR

The primary purpose of the proposed alterations to the odour management system is to improve the odour performance of the entire operation. Works have been programmed to enable the improvements to the odour management system to be completed as an initial sub-stage. This will enable the system to be placed into service while other construction activities are completed.

An odour impact assessment report has been prepared and is included as *Appendix C*. The report concludes that the proposed modifications when complete will result in a highly significant reduction to existing odour emissions and impact profile. The air output from the biofilter will be of a treated quality. It will not have the character of the current untreated process air.

The odour management system has been designed with sufficient capacity to accept odour from the plant when operating at its full approved capacity and with the existing bioscrubber mothballed. The initial loading on the system will be significantly less than this designed maximum. Planning provision has been made to increase the available treatment facilities by including extra ammonia scrubbers and biofilter area and provide redundancy if required in the future.

3.7 FLOODING

The substrate plant development is being undertaken on land that is already cleared and has been filled to provide a working platform above the once in 100 year flood level. The small amount of additional filling at the eastern end of the bioscrubber will cap filling already in place and will not affect flood performance as assessed in the project environmental assessment (Perram & Partners 2010).

3.8 FLORA AND FAUNA

The Mulgrave property has previously been surveyed as part of the environmental assessment for the Part 3A project (Perram & Partners 2010). The survey revealed that the land has been re-contoured in the past with surface vegetation primarily exotic grasses and herbs for grazing with some weed species. There is no useful animal habitat in the substrate plant site and no threatened species were recorded.

3.9 HERITAGE

The environmental assessment for the Part 3A project (Perram & Partners 2010) included an archaeological and cultural heritage assessment revealing no known or discovered artefacts of indigenous heritage on the site. The entire development site has been previously disturbed. There are no items of non-indigenous heritage listed for the site, although there are some heritage items on surrounding land.

REFERENCES

Perram & Partners (2010)
Mushroom Industry Expansion in Western Sydney, Environmental Assessment

Todoroski Air Sciences (2012)
Odour Management Plan, Elf Farm Supplies Substrate Facility

APPENDICES