ELF FARM SUPPLIES PTY LTD

ANNUAL ENVIRONMENTAL MANAGEMENT REVIEW

1 Purpose

The purpose of this document is to respond to a condition of project approval No 08_255 issued on 11 January 2012. Condition 3 of Schedule 5 of the project approval states as follows:

One year after the commencement of operations, and every three years thereafter, the Proponent shall review the environmental performance of the Project to the satisfaction of the Director-General. This review must:

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 approved project comprised development of a new mushroom farm in The Northern Road, Londonderry and expansion of an existing substrate plant In Mulgrave Road, Mulgrave. Condition 15 of Schedule 2 provided options for submitting the AEMR for the two sites of the approved project, as follows:

With the written approval of the Director-General, the Proponent may:

a) submit any reports, plans, strategies or programs required by this approval on a progressive basis; and
b) combine any reports, plans, strategies or programs required for the Substrate Plant site with any similar reports, plans, strategies or programs for the Mushroom Farm site.
c) separate any reports, plans,-strategies or programs required for the Substrate Plant site from any similar reports, plans, strategies or programs for the Mushroom Farm site.

This report covers the first 12-month period following project approval, being essentially calendar year 2012. The report refers to the mushroom substrate plant in Mulgrave Road, Mulgrave operated by Elf Farm Supplies. During the period of this report no work had commenced on the mushroom farm site in The Northern Road and hence there is nothing to report from that site.

The report is set out to respond sequentially to items a) to e) of condition 3 of schedule 5, shown above.

2 Operations During 2012

Operations at Elf Farm Supplies continued throughout 2012 including manufacture and supply of Phase 1, Phase 2 and Phase 3 mushroom substrate. The substrate was produced both in bulk and as

a blocked product. The plant continued to operate 24 hours per day, 7 days per week throughout the year. During calendar year 2012 the plant produced 71,964 tonnes of Phase 1 substrate

During the course of 2012 approvals were received for the following, submitted in accordance with the project approval:

Date of DoPE Letter	Approval	Relevant Condition
15 -2-2012	Appointment of odour expert to prepare OMP	Condition 4, schedule 3
13-3-2012	Construction Environmental Management Plan	Condition 1, schedule 3
22-5-2012	Appointment of Odour auditor	Condition 5, schedule 3
7-6-2012	Odour Management Plan	Condition 4, schedule 3
7-6-2012	Operational Noise Management Plan	Condition 22, schedule 3
12-7-2012	Energy Efficiency Plan	Condition 9, schedule 3
12-7-2012	Water Management Plan	Condition 17, schedule 3
12-7-2012	Environmental Management Strategy	Condition 1, schedule 5

3 Monitoring Results and Complaints Records

The project approval requires that a monitoring program be included in the following plans:

- Odour Management Plan (Condition 4)
- Operational Noise Management Plan (Condition 22)
- Energy Efficiency Plan (Condition 9)

3.1 Odour

3.1.1 Odour Monitoring

The odour management plan addresses odour monitoring as follows:

> *Under the current Environmental Protection Licence (No. 6229), the bio-scrubber exhaust odour emissions are set at 55,400 ou.m³/s. Bi-annual stack emission testing and odour testing are carried out to ensure this licence condition is not exceeded. This approach appears to be satisfactory at this time and no further actions appear to be warranted.*

To reflect the variability of odour emissions, the environment protection licence for the substrate plant specifies the emissions limit more particularly as being 55,400 ou.m^3/s with an averaging period of *rolling annual.* This means that compliance with the licence limit is determined when the results from 12 months are averaged.

The results of odour monitoring over a four year period that includes calendar year 2012, the subject of this AEMR, are shown in the following table. Monitoring is annualised each May to for submission to the EPA in accordance with the requirements of the environment protection licence. The highest and lowest readings are included for completeness but are not of relevance in determining compliance.

May 2012 – May 2013	Unit of measure	Samples Required	Samples Collected	Lowest Value	Mean of Samples	Highest Sample
Odour	ou.m^3/s	10	10	24,196	37,868	56,049
Temperature	Kelvin	10	10	299.4	303.9	310.4
Velocity	m/s	10	10	12.9	13.4	14.4
Volumetric Flowrate	m^3/s	10	10	9.5	14.2	15.6

May 2011 – May 2012	Unit of measure	Samples Required	Samples Collected	Lowest Value	Mean of Samples	Highest Sample
Odour	ou.m^3/s	10	10	10,752	22,769	41,471
Temperature	Kelvin	10	10	293.3	297.5	301.3
Velocity	m/s	10	10	12.4	13.0	13.3
Volumetric Flowrate	m3/s	10	10	13.7	14.9	15.7

May 2010 – May 2011	Unit of measure	Samples Required	Samples Collected	Lowest Value	Mean of Samples	Highest Sample
Odour	ou.m^3/s	10	10	22,774	31,424	42,567
Temperature	Kelvin	10	10	298.1	302.4	308.9
Velocity	m/s	10	10	13.9	14.9	16.3
Volumetric Flowrate	m^3/s	10	10	15.9	16.6	17.9

May 2009 – May 2010	Unit of measure	Samples Required	Samples Collected	Lowest Value	Mean of Samples	Highest Sample
Odour	ou.m^3/s	10	10	24,655	30,924	34,070
Temperature	Kelvin	10	10	294.7	301.3	309.7
Velocity	m/s	10	10	31.1	14.2	15.1
Volumetric Flowrate	m^3/s	10	10	13.5	15.5	17.0

3.1.2 Discussion

The environmental assessment for the project (Perram& Partners 2010) predicted odour impacts of the substrate plant using modelling based upon estimated source emissions. Appendix P of the EA is an air quality assessment prepared by PAE Holmes. Table 8.2 on page 21 of that appendix includes estimated emissions from the bio-scrubber stack for the various stages of operation used as inputs for modelling. Those estimates are as follows:

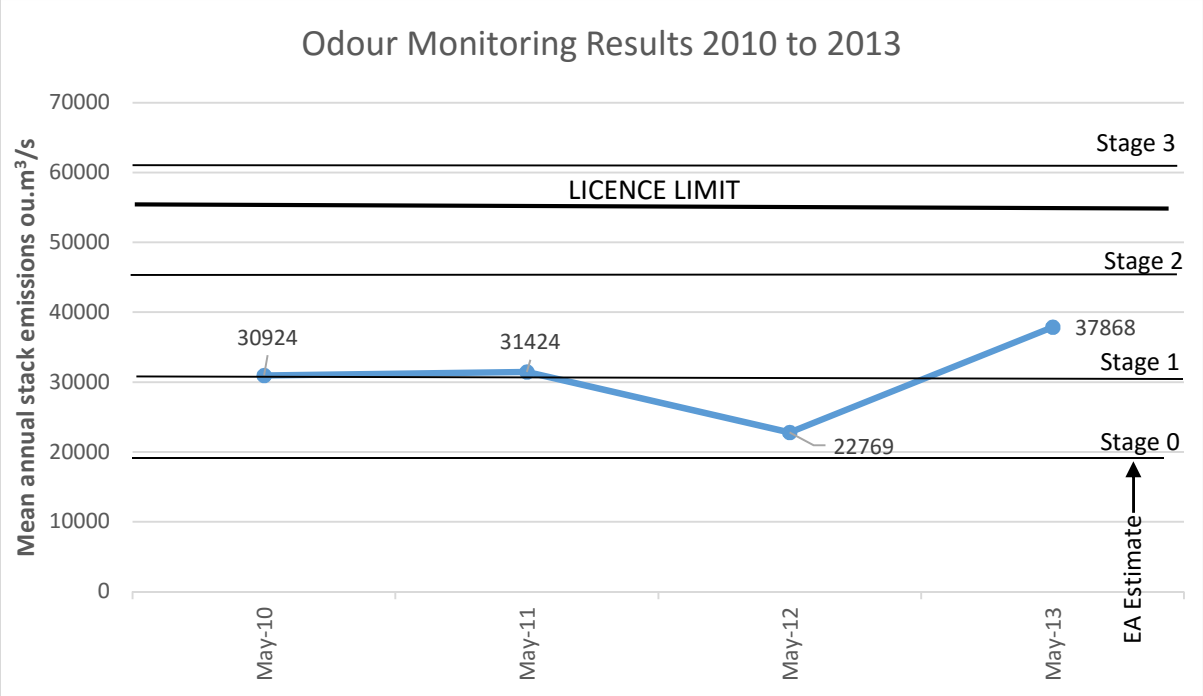
Development Stage	Maximum Production of Phase 1 substrate (tonnes/week)	Estimated stack emissions (ou.m^3/s)
Stage 0 (existing at 2010)	1000	19,200
Stage 1	1600	30,720
Stage 2	2400	40,080
Stage 3	3200	61,440

As indicated above, the limit of stack emissions set in the Environment Protection Licence for the plant is 55,400 ou.m^3/s based on a rolling annual average. The EA explained that ultimate advancement to Stage 3 would be subject to Elf Farm Supplies demonstrating that after continuing to develop and improve operations, production at Stage 3 levels can take place without exceeding the licence limit.

The chart below shows a plot of the mean stack odour emissions for the four sets of annual results tabulated above. As can be seen, while the average emission rate has fluctuated mildly from year to year, it has remained well below the licence limit and therefore in compliance. There is no significant trend.

During all of the years plotted the plant was approved to operate within Stage 0, as defined in the EA odour assessment. It is noted that the mean measured stack emissions have remained above the EA estimated emission rate for Stage 0 of 19,200 ou.m^3/s. This estimate has proven to be low and while the plant has remained in compliance, Elf Farm Supplies has maintained a careful watch during subsequent years particularly as production increased into Stage 1. [Results of monitoring in subsequent years that will be reported when the next AEMR is due have shown that after moving to Stage 1 the plant has continued to remain in compliance with the licence limit].

When Elf Farm Supplies receives each new set of odour monitoring results, the results are averaged with other results over the previous 12 months. Should the average ever exceed or approach the licence limit, operations would be investigated in detail and a further monitoring undertaken. This has not been necessary as averaged emissions have always remained well below the licence limit.



3.1.3 Odour Complaints

There have been four odour complaints during the 12-month period reported in this AEMR (2012), all received via the EPA:

Complaint #1 Wed 6th June 2012

Details:	No location of complaint given;
Investigation:	Wind blowing towards the NE at the time of the complaint; no operations underway onsite at the time of complaint
Action:	In the absence of activity on the site or location of the complaint, unable to verify whether the plant may have been the source of the odour and if so what may have caused it.

Complaint #2 Sun 19th August 2012

Details:	No location of complaint given; the complainant believed either EFS or the Mulgrave STP was the source and described the smell as a strong sulphur smell;
Investigation:	Wind variable direction all day; no operations onsite at the time of complaint;
Action:	In the absence of activity on the site or location of the complaint, unable to verify whether the plant may have been the source of the odour and if so what may have caused it.

Complaint #3 Mon 17th September 2012

Details:	Odour detected at Chisholm Place;
Investigation:	The wind direction was toward Chisholm Place at the time of the complaint; steam was observed coming from a building within the plant

Action: It is believed that fugitive emissions from open doors probably responsible; personnel doors were modified to "self-close".

Complaint #4 Thurs thru' Friday 6/7th December, 2012

Details: No location of complaint provided;
Investigation: Wind direction variable throughout the 26 hour period;
Action: In the absence of a location of the complaint, unable to verify whether the plant may have been the source of the odour and if so what may have caused it.

Elf Farm Supplies has made representations to the EPA that investigation of odour complaints would be greatly assisted if the location of the complaint could be provided and the information forwarded on a more timely basis, preferably on the same day. The EPA has agreed to assist, resulting in more information becoming available after 2012.

The protocol for investigating complaints is included in the Environmental Management Strategy for the Plant. A relevant extract from that document is attached for your information.

3.2 Noise

3.2.1 Noise Monitoring

The operational noise management plan addresses noise monitoring as follows:

> *It is proposed that within six (6) months of completion of each stage of the proposed upgrade of the substrate plant, noise monitoring be conducted at two (2) reference locations consistent with the closest residential receivers identified in Table 1, specifically Chisholm Place to the west and Railway Road/126 Mulgrave Road to the south-east. Where access to the identified receiver is not practical, alternative locations representative of the subject receiver/s could be considered.*
>
> *Nearfield measurements of fixed and mobile plant and equipment would also be conducted within six (6) months of completion of each stage of the proposed upgrade or when there is significant changes to site plant and equipment, to ensure compliance with the noise levels presented in Table 3 (Atkins Acoustics Report No. 41.6411.L4:CFCD5 Table 10).*

In the 12-month period covered by this AEMR no approved stages of the plant upgrade were completed. Consequently the need for noise monitoring did not arise.

3.2.2 Noise Complaints

There were no noise complaints received or reported to Elf Farm Supplies during the 12-month period reported in this AEMR.

3.3 Energy Efficiency

3.3.1 Energy Efficiency Monitoring

The energy efficiency plan included within the Environmental Management Strategy for the substrate plant (Perram & Partners 2012) addresses efficiency monitoring as follows:

Elf Farm Supplies will compile energy consumption data annually. Annual energy results will be reviewed against annual production data to confirm that energy efficiency is being maintained or improved.

The 12-month period covered by this AEMR is the base year for assessment of energy efficiency. The following data has been recorded for calendar year 2012.

Diesel usage (onsite) 194 kL

Electricity usage 4,144 MWh

Gas usage (approx.) 1228 GJ

The gas usage figure is an estimate based on six months of available data.

3.3.2 Discussion

The 2010 environmental assessment for the project included within Appendix P a greenhouse gas assessment prepared by PAE Holmes. The greenhouse gas assessment included a table of projected energy consumption for each stage of development. This table was subsequently incorporated in the energy efficiency plan, prepared following project approval and is reproduced below, but with a correction. The original table showed electricity consumption in kilowatthours (kWh). The correct unit is megawatthours (MWh), as shown in the table below. This correction will be carried through to the next revision of the energy efficiency plan.

Fuel Type	**Production Rate**			
	Existing	**Staged Expansion**		
	1,000 (t/week)	**1,600 (t/week)**	**2,400 (t/week)**	**3,200 (t/week)**
Diesel (kL)	135	216	276	336
Electricity (MWh)	3,000	4,800	6,720	8,640
Natural Gas (GJ)	810	1,296	1,944	2,592

As indicated in section 2 and further explained in section 4.3 below, the average weekly tonnage produced during 2012 was 1,384 tonnes. Energy consumption during the twelve month period is generally consistent with predictions for this level of production although gas consumption is close to the prediction for a production of 1,600 tonnes per week. Increased gas consumption is in part attributed to a change in procedure in 2012 where increased sterilisation of working areas required the boiler to be operated for longer periods.

Energy usage is likely to increase in the years following this base year for the reason that production quantities are increasing and fans and cooling systems are being operated at higher levels of output. Energy consumption will continue to be monitored annually and reported in future AEMR documents. The energy efficiency plan will be reviewed when the proposed upgrade to the plant has been installed, which will of necessity require increased energy consumption.

4 Non-Compliance with Conditions of Approval

An examination of the project approval indicated attention was required to achieve compliance with two conditions.

4.1 Boundary wall

Condition 21 of Schedule 3 formalised a recommendation from the noise consultant's report that the backing wall for the future eastern bale wetting area be constructed at the commencement of works. The condition is as follows:

> *21. The Proponent shall install the southern boundary noise wall adjacent to the bale storage shed on the Substrate Plant site prior to commencement of other stage 1 construction works.*

The eastern bale wetting area with its concrete backing wall was included in the 2010 project application. By the time approval was received in January 2012 Elf Farm Supplies was reviewing the need for the eastern bale wetting area following suggestions that outdoor bale wetting be discontinued for better control of fugitive emissions. Consequently as an interim measure, the company placed straw bales in a manner to provide an equivalent noise barrier to that which would have been achieved had the concrete wall been constructed.

Following representations from the Department of Environment and Planning regarding compliance, a request has been made to the Department for the condition to be amended to allow an alternative noise abatement solution to be submitted and if approved, implemented. This request has been included for consideration in response to submissions to the 2015 application for modification to the project approval. The alternative solution would provide a noise barrier to be specified rather than a concrete wall.

4.2 Riparian Corridor

Condition 23 of Schedule 3 reads as follows:

> *23. The Proponent shall establish a fenced, 35 metre wide riparian corridor along the length of South Creek within 12 months of commencement of operation of Stage 1. The Proponent shall consult with the Hawkesbury-Nepean Catchment Management Authority on methods and species selection to ensure that best practise techniques are used at the site, to the satisfaction of the Director-General.*

Elf Farm Supplies initially contacted the CMA to discuss this requirement and had been waiting for a meeting to be arranged. As time elapsed, the matter was not followed through. The current need to undertake earthworks and revegetation associated with the 2015 application for modification to the project approval has provided an opportunity to create an enhanced wildlife corridor through the area which is close to completion. This corridor has the benefit of connecting areas of semi-mature revegetation associated with the substrate plant and the adjoining Hawkesbury Valley Way

Elf Farm Supplies has contacted Local Land Services (successor to CMA) on 7 September 2015. Arrangements have been made for LLC to inspect the riparian area and meet with Elf Farm Supplies to discuss a way forward. This matter will be pursued to finalisation

4.3 Annual Tonnage

Condition 6(2) of Schedule 2 is as follows:

> *6.(2) The proponent must not produce on the Substrate Plant site more than 1.000 tonnes of phase 1 substrate per week except in accordance with a staged approval granted by the Director-General in accordance with condition 7 Schedule 2 below.*

As indicated in section 2, the plant produced 71,964 tonnes of Phase 1 substrate during calendar year 2012. This equates to an average weekly production of 1,384 tonnes. During the year the plant output grew in response to increasing demand for substrate from mushroom farms.

In the first half of 2012 Elf Farm Supplies could see that the average annual tonnage was trending high and sought approval from the Director-General for appointment of an independent odour auditor, a necessary step in obtaining approval to increase production. That approval was received on 22 May 2012. The independent odour audit was finalised in early 2013 and forwarded to the EPA for comment and then to the Department. Approval to increase production was received in July 2013. Hence the action taken resolved the non-compliance for future years.

5 Trends in Monitoring Data

As previously indicated, there are no discernible trends in monitoring data. The 12-month period covered by this first AEMR is essentially the baseline.

6 Measures to Improve Environmental Performance

The approved Odour Management Plan (OMP) for the site (Todoroski Air Sciences 2012) required 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.

On the 12th January 2015, EFS submitted an environmental assessment (EA) for Modification to an Approved Project, which includes designed solutions to the suggestions in the 2012 Todoroski OMP.