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Vipac Engineers & Scientists

Australian Agricultural Company Limited



Northern Australian Beef Limited

Livingstone Beef – Odour Management Plan

70Q-15-0248-TRP-518855-1

16 Dec 2015



| Livingstone Beef – Odour Management Plan Northern Australian Beef Limited | | | | | | | | | | | | | | |
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EXECUTIVE SUMMARY

The purpose of this document is to define how the potential and actual generation of odour from the Northern Australian Beef Limited (NABL) facility at Livingstone (the Facility) is identified and, as far as is reasonably practicable, controlled.

The format meets the requirements of the Notice issued on 17th August 2015 by Northern Territory Environmental Protection Authority (NT EPA).

This OMP has been prepared as a useful manual which can co-exist with other operations manuals for individual equipment and the Standard Operating Procedure document. In order for this OMP to be implemented effectively, the processes at NABL have been categorised according to their odour potential.

This OMP is a living document and it should be reviewed and updated every six months or when practices/equipment change. During this review, the effectiveness of the odour controls taking into consideration any complaints, monitoring levels, inspections, ambient odour surveys, training and feedback.

Auditor's Declaration

The Odour Management Plan (OMP) provides details of how items of plant should be operated and maintained in order to avoid the generation of unacceptable odours. It also details methods of responding to odour complaints. The processes provided in the OMP appear sound and should help minimise the generation of odours from the site. The odour complaint recording, investigating and response process is also detailed and appears suitable. The OMP will need to be updated once details of the proposed water treatment facilities are finalised.

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1 INTRODUCTION

The purpose of this document is to define how the potential and actual generation of odour from the Northern Australian Beef Limited (NABL) facility at Livingstone (the Facility) is identified and, as far as is reasonably practicable, controlled.

The format meets the requirements of the Notice issued on 17th August 2015 by Northern Territory Environmental Protection Authority (NT EPA).

1.1 ODOUR SOURCES AND NABL

The odour sources at NABL are typical of other abattoir operations. Some of the processes are more odorous than others, whilst some are not odorous at all. A simplified process chart of NABL operations is presented in Figure 1-1.

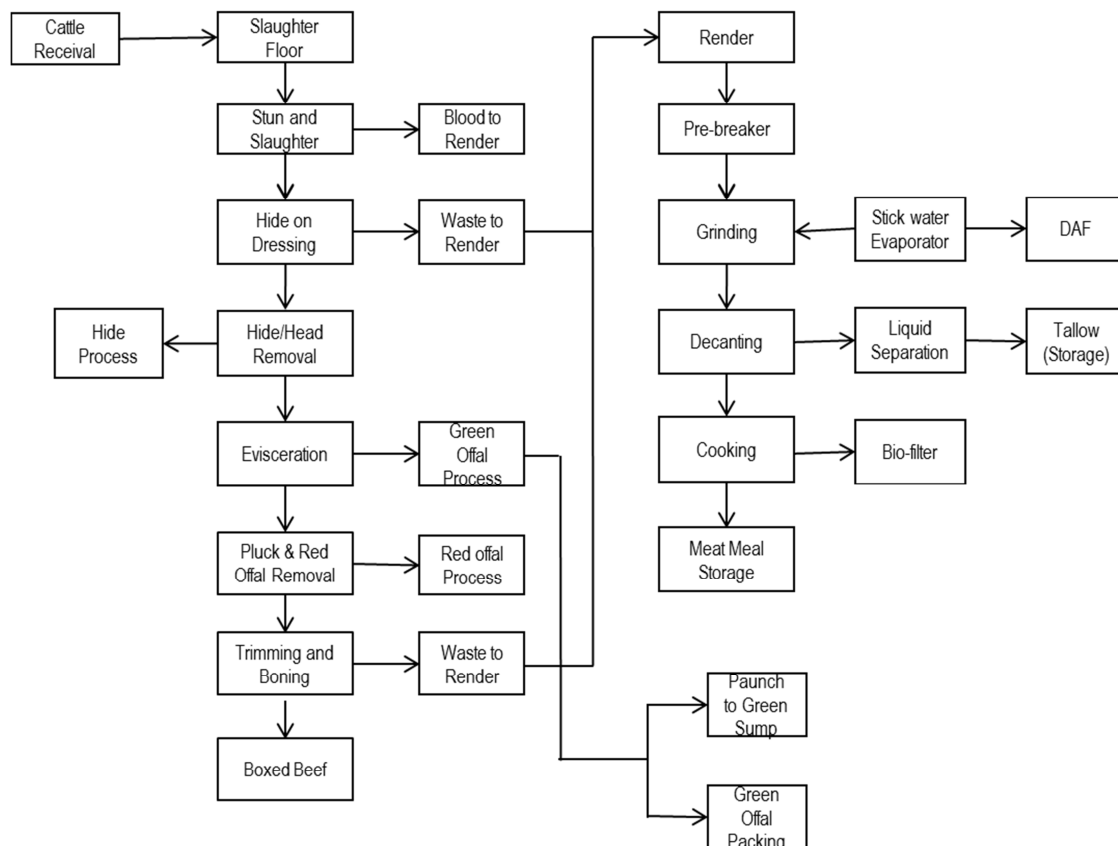


Figure 1-1: Summary of Main Cattle Processes (Excluding Wastewater)

1.2 PURPOSE OF THIS DOCUMENT

The control of odour is a continuous cyclic process as presented in Figure 1-2 and this Odour Management Plan (OMP) aims to provide a framework whereby NABL can control, minimise and manage the identified odour sources in response to the Audit requested by NT EPA in August 2015.

The purpose of this document is to define how the potential and actual generation of odour from the different processes of the Facility occur and, as far as is reasonably practicable, can be controlled.

The format used in the OMP is presented as a stand-alone document which could be used in conjunction with the plant operational manuals, where available.

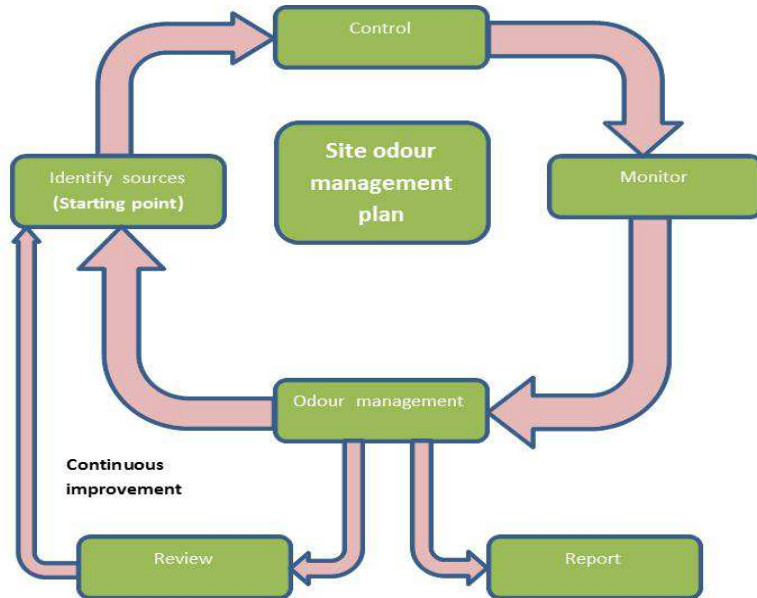


Figure 1-2: Odour Management Cycle

1.3 AVAILABILITY

This OMP document should be readily available at every process location where odour is considered an issue.

1.4 DISCLAIMER

Any maintenance requirements contained in this document aim to complement the maintenance requirements as detailed in the Operations Manuals for any plant. The maintenance requirements in any of the Operations Manuals for individual plant take precedent over this OMP.

2 ODOUR MANAGEMENT AT NABL

This Section outlines the management processes, housekeeping, staff responsibilities, record keeping and staff competence.

2.1 HIERARCHY OF ODOUR CONTROLS

The most appropriate hierarchy of odour control management is presented in Figure 2-1. The prevention of odour releases is the preferred method rather than control. This method requires good management as well as plant maintenance and housekeeping procedures. Where it is not practicable to prevent the odour releases they should be minimised to a level that will not cause odour nuisance.

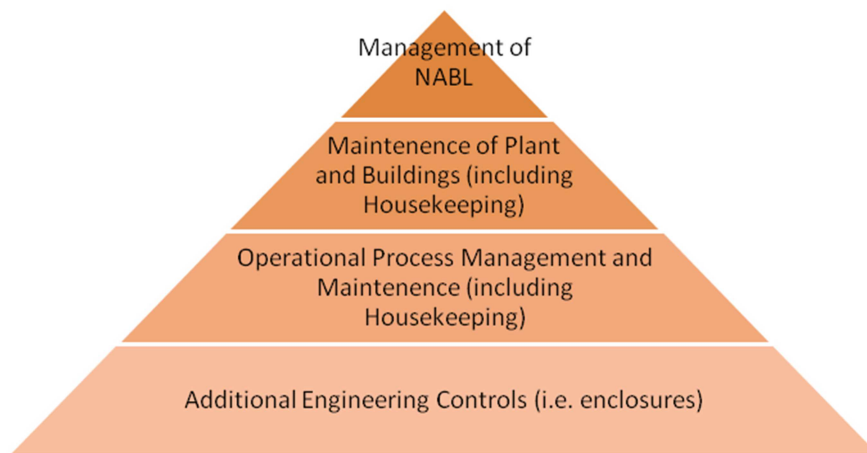


Figure 2-1: Preferred Hierarchy of Odour Controls

2.2 RESPONSIBILITIES

The organisation structure is presented in Table 2-1. This organisation structure, as detailed in the Operation Environmental Management Plan (OEMP) (EcOZ, 2015a) provides details of the names, positions titles and environmental management responsibilities of personnel employed at NABL.

Table 2-1: Organisational Structure and Responsibilities

| Position | Responsibilities |
|-----------------------|--|
| Plant manager | <ul style="list-style-type: none"> Responsible for all operations within the project area. Primary Environmental Emergency contact. |
| Trainee Plant Manager | <ul style="list-style-type: none"> Responsible for operations within the project area. Organising of relevant waste removal contractors for the plant. |
| Chief Engineer | <ul style="list-style-type: none"> Responsible for the implementing of odour practices and regular maintenance of machineries to ensure optimum operations |
| Production Manager | <ul style="list-style-type: none"> Responsible for the supervision of cleaning and housekeeping requirements |
| Procurement Officer | <ul style="list-style-type: none"> Management of ordering and handling of chemicals within the plant. |
| QA Manager | <ul style="list-style-type: none"> Responsible for the management of environmental incidents which occur in quality assurance area. Maintenance of the chemical register. |
| HR Business Manager | <ul style="list-style-type: none"> Responsible for providing all relevant environmental information during the induction of new employees. |
| Environmental Officer | <ul style="list-style-type: none"> Responsible for overseeing the daily environmental inspections and operational management measures. Weed management, Environmental incident recording/ reporting and implementing of all required compliance tasks of the EPL |

2.3 DOCUMENT IMPLEMENTATION AND REVIEW

The implementation of this OMP is the responsibility several personnel as identified in Table 2-1. The OMP will be stored on the AACo Quality Management System and will be made available to facilitate staff. The individual management plans will be made available and stored in a place where all staff can reference the document.

This OMP is a living document and will be reviewed and updated every six months or when practices/equipment change. During this review the effectiveness of the odour controls taking into consideration any complaints, monitoring levels, inspections, ambient odour surveys, training and feedback.

2.4 PLANNED MAINTENANCE

An effective, planned inspection and preventative maintenance regime will be employed on all plant and equipment identified in this Odour Management Plan (OMP) as impacting on odour. A written maintenance programme is included for each area detailed in this OMP which complements the Operations Manual requirements. Schedules will be prepared for the replacement of equipment in accordance with the appropriate Operations Manual. When planned maintenance is scheduled NABL will provide the following:

- A record of maintenance will be made available for inspection;
- A system to firstly mitigate any potential odours; and
- A method for forewarning the community on intended maintenance works that may lead to odours beyond the site boundary will be developed.

2.5 EQUIPMENT SPARES

Adequate supplies of common spare parts and consumables will be kept on site. Records will be kept of the delivery and usage of all chemicals and spares, and these records will be used to minimise the risk of depletion of stocks.

Table 2-2 presents a list of essential spares for odour control equipment. These spares are subject to wear and foreseeable failure and are critical for the correct operation of the odour abatement equipment.

The spare parts required to repair the equipment are pumps, bearings and motors; all of these parts are interchangeable and can be purchased from a range of suppliers so that minimal spare need to be purchased from Haarslev. These alternative suppliers include CBC Bearing and SKF Bearings.

In the event of a break-down, there are enough inter-changeable spares in the store, allowing the production to continue.

Table 2-2: Equipment Spares Log Sheet

| Location | Equipment Installed | Store Spares (Items and Quantities Held on Site) | Freight Options | |
|-----------------|---|--|--------------------|-------------------|
| | | | Normal (7-10 days) | Urgent (Next day) |
| DAF | | | | |
| Sump Pits | Duty & Stand-By pump located at each Sump | Bearing and seal kits | ✓ | ✓ |
| Dosing Tanks | Spare pumps in store | 1 x Spare Pump | ✓ | ✓ |
| Irrigation Tank | One Duty Pump and one spare pump in store | 1 x Spare Pump | ✓ | ✓ |

| Location | Equipment Installed | Store Spares (Items and Quantities Held on Site) | Freight Options | |
|------------------------|---|--|--------------------|-------------------|
| | | | Normal (7-10 days) | Urgent (Next day) |
| Transfer Station | Duty & Stand-By pump located at each transfer station | Bearings and seal kits | ✓ | ✓ |
| V.S.D. (Electrical) | AB PowerFlex 40 | 1 x Each size | ✓ | ✓ |
| Device net Cards | PLC Controls | 1 x Each size | ✓ | ✓ |
| Rendering Plant | | | | |
| Transfer Screws | Geared Motors | 1 x Each size | ✓ | ✓ |
| | Shaft Bearings | 1 x Each size | ✓ | ✓ |
| Tallow System | Tallow Transfer Pumps | 1 x Stator & Rotor | ✓ | ✓ |
| | | Bearings and seal kits | ✓ | ✓ |
| Meal Dryer | Burner | Full spare Gas Train | ✓ | ✓ |
| | | 1 x Spare motor | ✓ | ✓ |
| | Drum | 1 x spare roller Ass. | ✓ | ✓ |
| Bio-Filter System | Extraction Fans | Bearings and seal kits | ✓ | ✓ |
| | Condenser | 1 x Spare Pump | ✓ | ✓ |
| | | Bearings and seal kits | ✓ | ✓ |

2.6 EMERGENCY BREAKDOWN PROCEDURE

An Emergency Breakdown Procedure (EBP), which can be applied to break-downs, has been developed for the Facility. This procedure includes the responsibilities, methodology, monitoring, corrective actions and record keeping requirements in the event of an emergency. Emergency Response Procedure is presented in Appendix B.

2.7 CHECK SHEETS

Check sheets for each area are provided. For the lairage, hides processing new daily check sheets have been created. These sheets should be located in a place where all staff can access them throughout the day to report any issues which may lead to odour.

2.8 OPERATIONAL PARAMETER SETTINGS

The full plant is under constant monitoring by site specific software developed by Haarslev Industries. In terms of controlling the gas output of the rendering plant, A full shed audible alarm sounds at any breach of system parameter settings notifying operators.

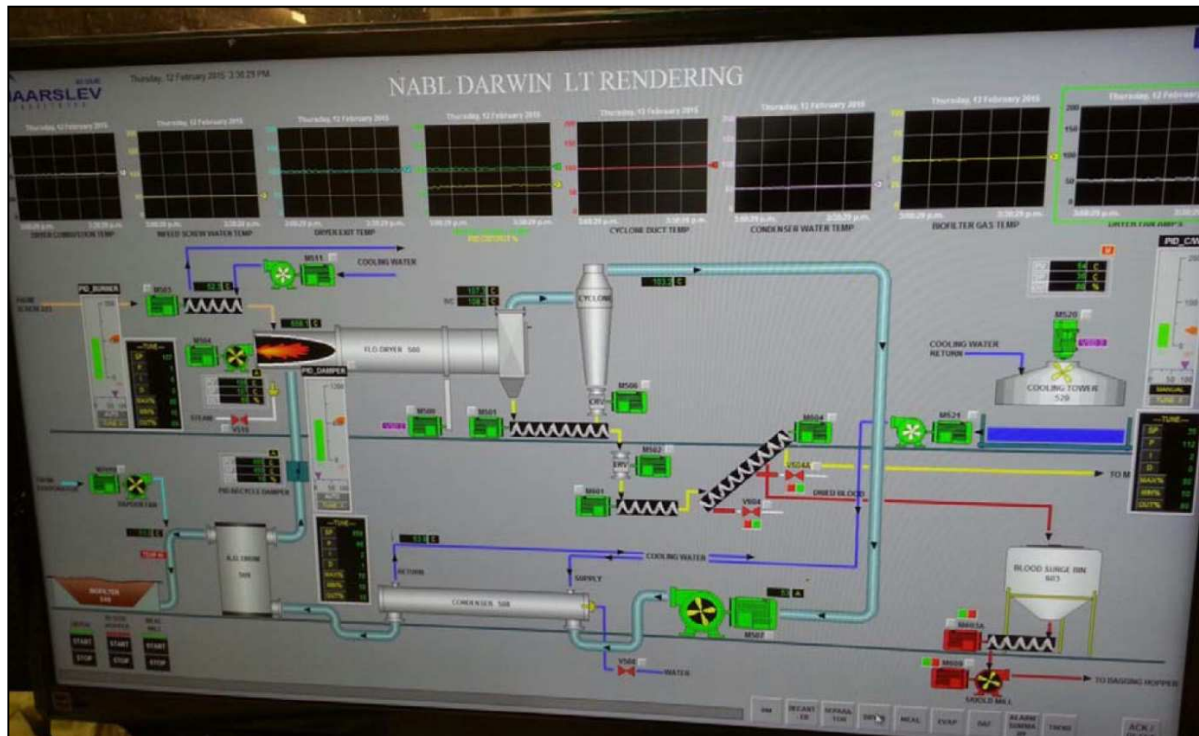


Figure 2-2: An example Screenshot of Software

It is the responsibility of the systems operator to notify the Production Manager if an error occurs.

2.9 STAFF COMPETENCE AND TRAINING

Staff at all levels having duties related to the management, operation, maintenance or repair of odour-critical processes and plant should be trained and must attain appropriate level of competence. Staff training and skill level records are to be maintained and be available for inspection.

NABL should maintain a statement of training requirements for each Process Area and keep a record of the training received by each person whose actions may have an impact on the environment

Training requirements include:

- Awareness of their responsibilities for avoiding odour nuisance;
- Minimising emissions on start-up and shut-down;
- Actions to minimise odour emissions during abnormal conditions; and
- Procedures for advising key persons and recording episodes when odour emissions occur which are likely to lead to odour complaints.

2.10 RECORD KEEPING

NABL will maintain a database of several records for a minimum of seven years:

- A maintenance record database identifying the on-going and emergency maintenance tasks undertaken;

- Records will be kept of the delivery and usage of all chemicals and spares, and these records will be used to minimise the risk of running out;
- Detailed record of complaints relating to odour;
- Detailed record of inspection checklists and monitoring results (daily, weekly, monthly etc.); and
- Detailed records of staff training.

2.11 COMMUNITY CONSULTATION

The *Consultation and Communication Plan* (CCP) outlines the scope of the Plan, identifies the stakeholders and their concerns and provides the following approach:

1. 24-hour phone line – a member of staff (Plant Manager or delegate) is contactable 24-hours a day, 7 days a week by mobile phone.
2. Community Reference Group – a monthly meeting with a group of local residents and chaired by the Plant Manager.
3. Website – a website provides access to information about facility operations, employment opportunities, the environment and community engagement.
4. Facility Tours – NABL have previously run Facility tours.
5. Complaints Register – NABL maintain a complaints register.
6. Publication of Environmental Data upon request.
7. Updates on plant and process changes to reduce odour.

The Plant Manager attends the monthly Community Reference Group and this is the ideal opportunity to present findings of the regular odour surveys.

It is acknowledged that a monthly meeting may not suffice in some circumstances and NABL are currently developing a website for the community. It is proposed that this website will provide a range of information including planned maintenance of odour critical equipment; weather data; plant shut downs, environmental reports. Discussions relating to submitting odour complaints via this website are on-going. The proposed content and layout is currently being developed and NABL and in time will consult with the community to ensure that the website is a useful tool that benefits the community. NABL propose to discuss this at one of the monthly meetings when the website has been developed further.

2.12 COMMUNITY COMPLAINTS

NABL have developed a Complaints Handling Procedure in order to provide a robust approach to any odour complaints. The procedure is divided into two parts:

- Part 1 – Details how the complaints are to be handled and the personnel responsible. This includes a Community Complaint Form; and
- Part 2 – Ambient Odour Monitoring Survey which includes all procedures to be undertaken, personnel responsibilities, timeframes and forms to be completed during the surveys. There are two separate surveys to be carried out upon a complaint:
 - A Rapid Plant Assessment which is to be undertaken by trained NABL staff. This involves inspecting the entire plant for odour through sniff tests; and
 - An external investigation to be completed by the Environmental Officer and subsequent reporting.

Figure 2-3 presents the flow chart of the Ambient Monitoring Survey procedures and responsibilities.

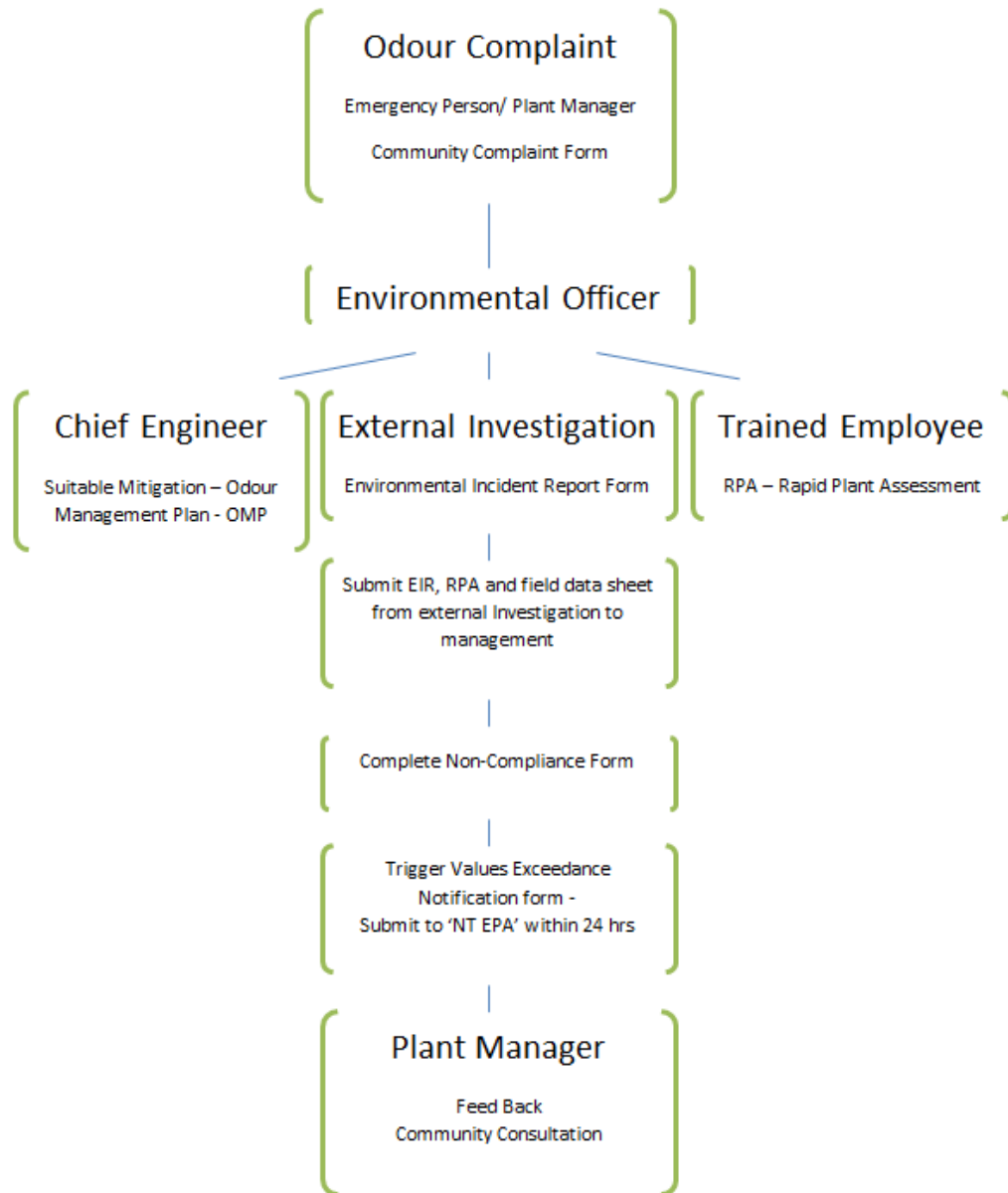


Figure 2-3: Ambient Monitoring Survey Procedure Flow Chart

3 HOW TO USE THIS DOCUMENT

This OMP has been prepared as a useful manual which can co-exist with other operations manuals for individual equipment and the Standard Operating Procedure document (Appendix C). In order for this OMP to be implemented effectively the processes at NABL have been categorised according to their odour potential.

Based upon the process flow diagram presented in Figure 1-1, Table 3-1 provides a ranking for odour potential at each process and where the odour controls for each process are presented. These rankings are based on the odour monitoring and modelling carried out on the site.

Table 3-1: Odour Ranking of NABL Processes and References

| Process | Odour Potential | Reference for Odour Controls |
|---------------------------|-----------------|------------------------------|
| Slaughter Floor | Negligible | See Section 4 |
| Lairage | ○○○ | See Section 5 |
| Rendering and By-Products | ○○○ | See Section 6 |
| Bio-filter | ○ | See Section 6 |
| Hide Processing | ○ | See Section 7 |
| Wastewater Treatment | ○○ | See Section 8 |
| Wastewater Irrigation | ○○○○ | See Section 9 |
| Boxed Beef Storage | Negligible | See Section 4 |
| Key: | ○ Low | ○○ Medium |
| | | ○○○ High |
| | | ○○○○ Very High |

Each odour critical area has its own management plan and check lists.

3.1 RISK FACTORS

During operations, there are a number of risk factors as identified in Table 3-2.

Table 3-2: Risk Factors, Consequences and Processes Affected

| Risk Factor | Consequences | Slaughter Floor | Boxed Beef Storage | Hides Processing | Lairage | Bio-filter | Rendering | Wastewater and Irrigation |
|----------------------------|--|-----------------|--------------------|--|--|---|--|--|
| Adverse weather conditions | Irrigation will be operated to allow continuous dispersal of treated waste water at 1 mm/m ² as per NTEPA EPL131. This will allow the plant to continue to operate. | No | No | No | Wet manure can increase odour by 50 – 100 times ¹ | May affect optimal moisture levels | No | Irrigation will be managed in a way that minuses odour during rainfall events |
| Power failure | Three gas-fired generators on-site. The plant can operate with one or two generators allowing essential plant to continue (processing chain, rendering, boxed beef storage and WWTP) | No | No | Hides manually salted. No odour emissions. | No | No | No | No |
| Spillages | Most tanks are located in a bund, which prevents the contents of the tank from spilling further afield or entering the water ways. Irrigation tank presents highest risk. DAF can be switched off and water held in balancing tanks. | No | No | No | No | No | Self bunded building with drainage to the waste treatment plant. | Any spills will be captured by the first flush dam and returned for irrigation |
| Equipment breakdown | If there is a breakdown of plant the individual processes can be switched off. Some buildings (boxed storage and slaughter are air tight to prevent odour releases). | No | No | Preserving operations cease. Odour impacts minimal | No | Plant interlock. High temp gas can't enter the bio-filter. Fans switch of and stop operations | Rendering will cease. Raw meat and by-products are enclosed | DAF turned off and untreated water held in balancing tank. |

¹ Australian Lot Feeders' Association (2003). Pen Surface Management and Making the Most of your Feedlot By-Products. FSA Consulting



| Risk Factor | Consequences | Slaughter Floor | Boxed Beef Storage | Hides Processing | Lairage | Bio-filter | Rendering | Wastewater and Irrigation |
|--------------------------------|--|-----------------|--------------------|------------------|---------|---|-----------|--|
| Ruptured or disconnected pipes | Unexpected odour releases from pipework. Main concern is ensuring all WWTP pipes are sufficient. Process water can overflow to trade waste drains; this limits impacts from slaughter and hides. | No | No | No | No | Pipes to bio-filter cause fugitive odour releases | | DAF can be isolated to for maintenance |

4 GENERAL ODOUR CONTROLS

This Section outlines general recommendations for routine and enhanced odour controls and housekeeping procedures that will be followed site-wide. More detailed information for each area of concern is presented in other sections of this document. The basic odour control techniques during operations include:

- Control and minimisation of odours from residual materials and waste (raw materials, by-products or sludge waste);
- Optimising process flow to treat waste water at a rate that prevents an anaerobic environment from forming;
- Containment of strong odour sources and treatment in odour control equipment;
- Operation of the process steps to minimise odour;
- Thorough cleaning practices throughout the site; and
- Maintain point source odour control equipment at all times and keep buildings closed as far as practicable.

Lack of good housekeeping can result in elevated levels of residual odour, and at times more serious sources of odour. The majority of good housekeeping is, in any case, good working practice and additional costs for odour control are minimal. Generic housekeeping includes:

- Dropped material or spilt tallow should not be left to develop odours;
- Quick processing of materials to minimise odour generated from bacterial degradation is essential;
- Rendering material should be stored in an enclosed receptacle, and any material not removed for rendering within 24 hours of production should be refrigerated below 30°C until it is processed;
- Equipment and machinery are to be kept clean of raw materials and residues;
- Bins for holding raw material and rendering products should be shrouded or covered, and grinding, processing and conveying equipment must be completely enclosed, where possible;
- Receival and storage bins should not accumulate any liquid or solid wastes; the wastes should be drained or pumped on a continuous basis;
- Receival and storage bins may need to be designed so that they can be cleaned with high pressure hot and/or cold water at least once a day;
- Draining tanks for cleaning has been implicated as a source of odour complaints. This should be scheduled to minimise impact. Where practicable, appropriate chemicals should be used to minimise this impact;
- Storage of sludge product on site should be minimised;
- The build-up of scum or foam on tank surfaces can at times lead to odour and should generally be avoided. (However, a stable scum layer can reduce odour in some instances, e.g. sludge storage); and
- All conveyors and pipe runs for waste matter transfer operations are capable of being dismantled for effective cleaning.

5 LAIRAGE MANAGEMENT PLAN

This Management Plan for lairage operations will be made available to all staff working in this area. All staff will receive training outlining the importance of cleaning the yards and when to determine when the yards need to be cleaned by an external company.

5.1 PROCESSES AND ODOUR

The Facility has a maximum capacity of 1,400 head in the storage yards. Currently the cattle are unloaded from the trucks held in the yards for no more than 24-hours before being transferred to the slaughter floor.

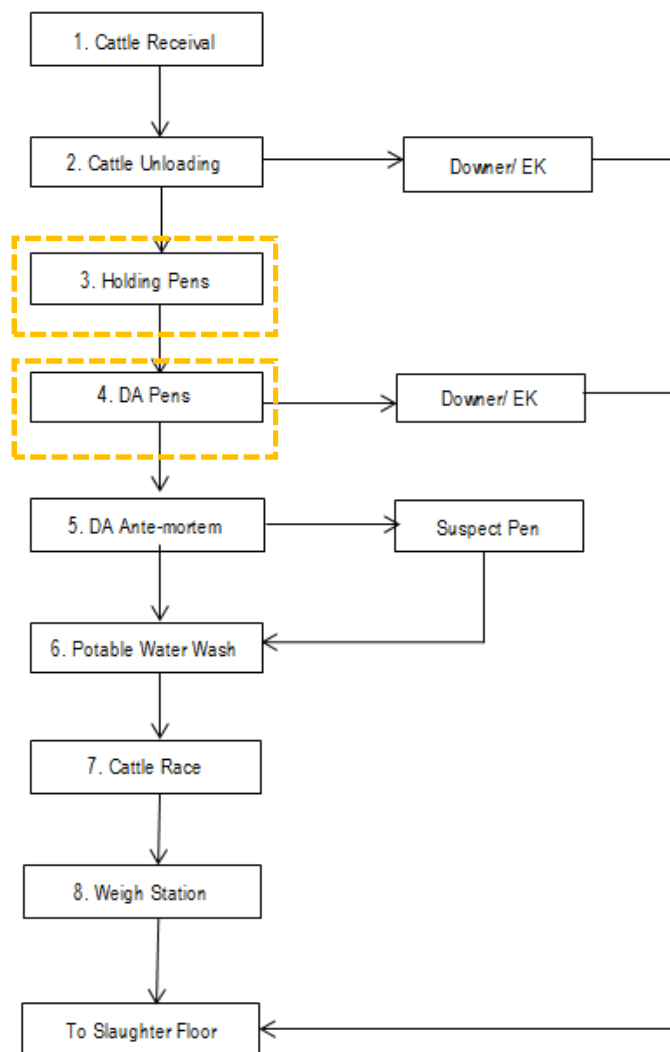
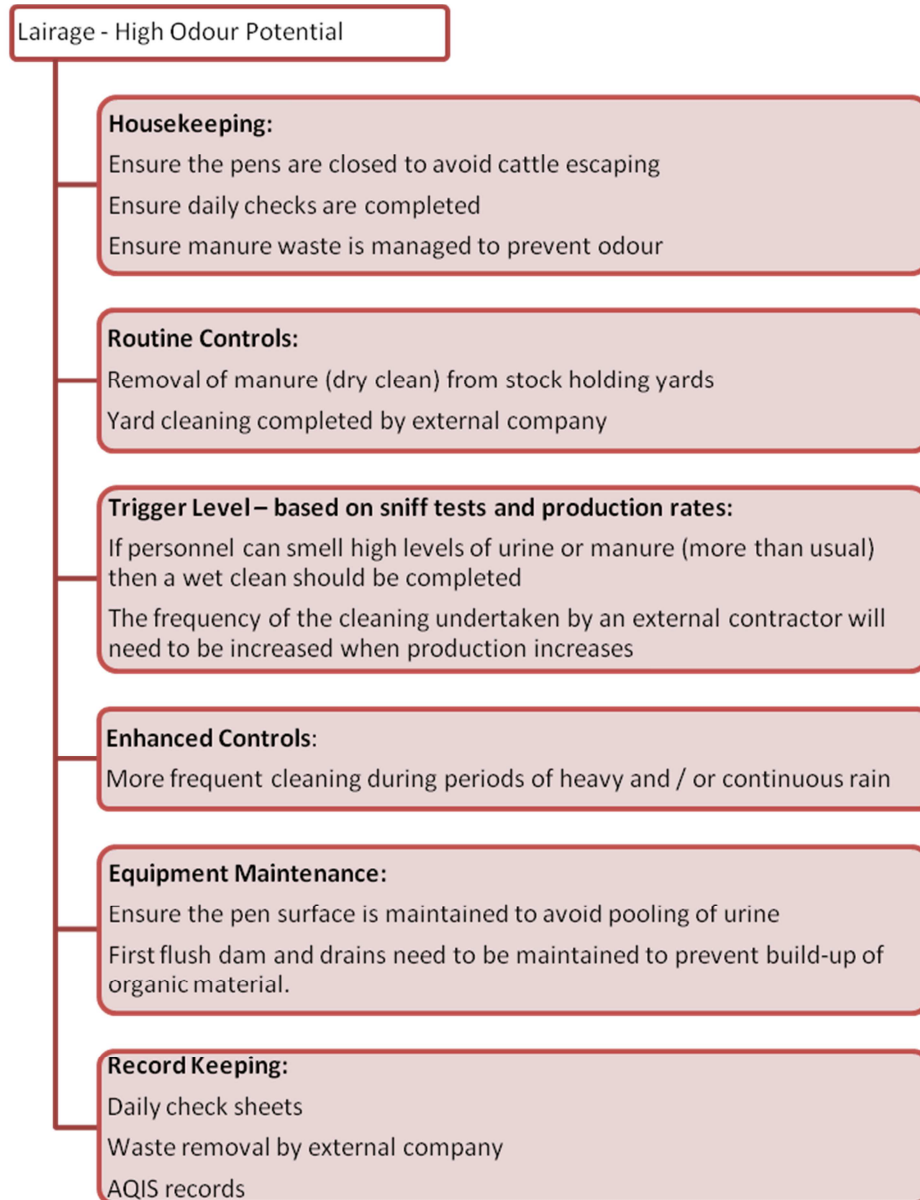


Figure 5-1: Detailed Process Flow Chart for Lairage (Odorous Releases in Orange Boxes)

5.2 OVERVIEW OF ODOUR CONTROLS

The lairage operations have been classified as having a medium odour potential. The main odour emissions will be from manure and urine, therefore the housekeeping and routine controls requirements are strongly related to cleaning.



5.3 OPERATIONAL PARAMETER SETTINGS

There are no operational parameters associated with lairage.

5.4 CONTINGENCY PLANS

Table 3-2 identified that for the lairage area there were one risk associated with heavy rain. This is discussed in the Lairage Management Plan.

5.5 LAIRAGE MANAGEMENT PLAN

The following table provides the management plan for the lairage activities, including personnel responsible, frequency of actions and records to be completed.

Table 5-1: Lairage Management Plan

| Control Classification | Specific Tasks / Actions | Personnel Responsible | Frequency of Actions | Records to be Completed |
|------------------------|---|---|---------------------------------------|-------------------------|
| Housekeeping | Ensure the pens are closed to avoid cattle escaping | All staff | Daily | Daily checklist |
| | Ensure daily checks are completed | Production Manager | Daily (at end of shift) | Daily checklist |
| | Ensure manure waste is managed to prevent odour | All staff / Env. Officer | At all times | Waste transfers |
| Routine Controls | Removal of manure (dry clean) from stock holding yards | Production Manager | As needed | Daily checklist |
| | Yard cleaning completed by external company | Production Manager | As often as required | Waste transfers |
| Trigger Levels | Sniff tests - smell of urine / manure | All staff | At all times | Daily checklist |
| | Increase the frequency of cleaning by external contractors depending on production rates, and sniff tests | Production Manager | Depending on production rates | Waste transfers |
| Enhanced Controls | Additional monitoring will occur during the wet season | Env. Officer / Production Manager | Depending on production rates/weather | Waste transfers |
| Equipment Maintenance | Ensure the pen surface is maintained to avoid pooling of urine | All staff / Chief Engineer / Env. Officer | At all times | Daily checklist |
| | First flush dam and drains need to be maintained to prevent build-up of organic material. | Chief Engineer | At all times | Maintenance records |

5.6 DAILY CHECK SHEET (LAIRAGE)

This sheet should be printed and placed into a procedure where all staff can access it.

| Lairage – Daily Checklist | | |
|--|--|-------------------------------|
| Date: | | |
| Time: | | |
| Operator: | | |
| Date of Last Wet Clean: | | |
| Weather Conditions: | Temperature (°C): | |
| | Rain (mm): | |
| | If heavy rains (> 50 mm/24 hours) are forecast – <u>dry and wet</u> clean the pens more frequently | |
| Pre-Work Checks | | |
| <i>Checks to be completed</i> | <i>Y/N</i> | <i>Comments</i> |
| Was <u>dry</u> cleaning completed the previous evening? | | |
| Are the pens suitable for holding cattle? (Identify any broken panels, gates that won't close etc.) | | If no, contact Chief Engineer |
| Is the surface of the pen free of pot holes? | | If no, contact Chief Engineer |
| Is the odour stronger than normal? | | |
| Other observations: | | |
| | | |
| During the Day | | |
| <i>Checks to be completed</i> | <i>Y/N</i> | <i>Comments</i> |
| Are there any odours present? | | Where are the odours from? |
| Is there pooling of urine / large quantities of manure? | | |
| Other observations: | | |
| | | |
| End of Day Checks | | |
| <i>Checks to be completed</i> | <i>Y/N</i> | <i>Comments</i> |
| Has <u>dry</u> cleaning been completed? | | |
| Is manure stored in leak-proof bins with lids? | | |
| Other observations: | | |
| | | |
| <div style="display: flex; justify-content: space-between; font-size: small;"> Northern Australian Beef Limited Version No: 1 Page 1 of 1 </div> <div style="display: flex; justify-content: space-between; font-size: x-small;"> Authorised By: Compliance/General Manager Innovation and Technology Date of Revision: 25th Nov 2015 </div> | | |

6 RENDERING PLANT AND BIO-FILTER MANAGEMENT PLAN

This Management Plan for render plant will be made available to all staff working in this area. All staff will receive training outlining the importance of cleaning procedures and equipment maintenance.

6.1 PROCESSES AND ODOUR

All material entering the rendering plant is processed on the same day as slaughter (subject to plant breakdowns), and no other material for rendering is imported to the site. The majority of the rendering processes emit odours as shown in Figure 6-1; these emissions are either passively ventilated at the top of the rendering building or piped through the bio-filter.

The bio-filter use micro-organisms growing on the media to remove odour from the air which flows through the media. The resultant air is CO₂ and water.

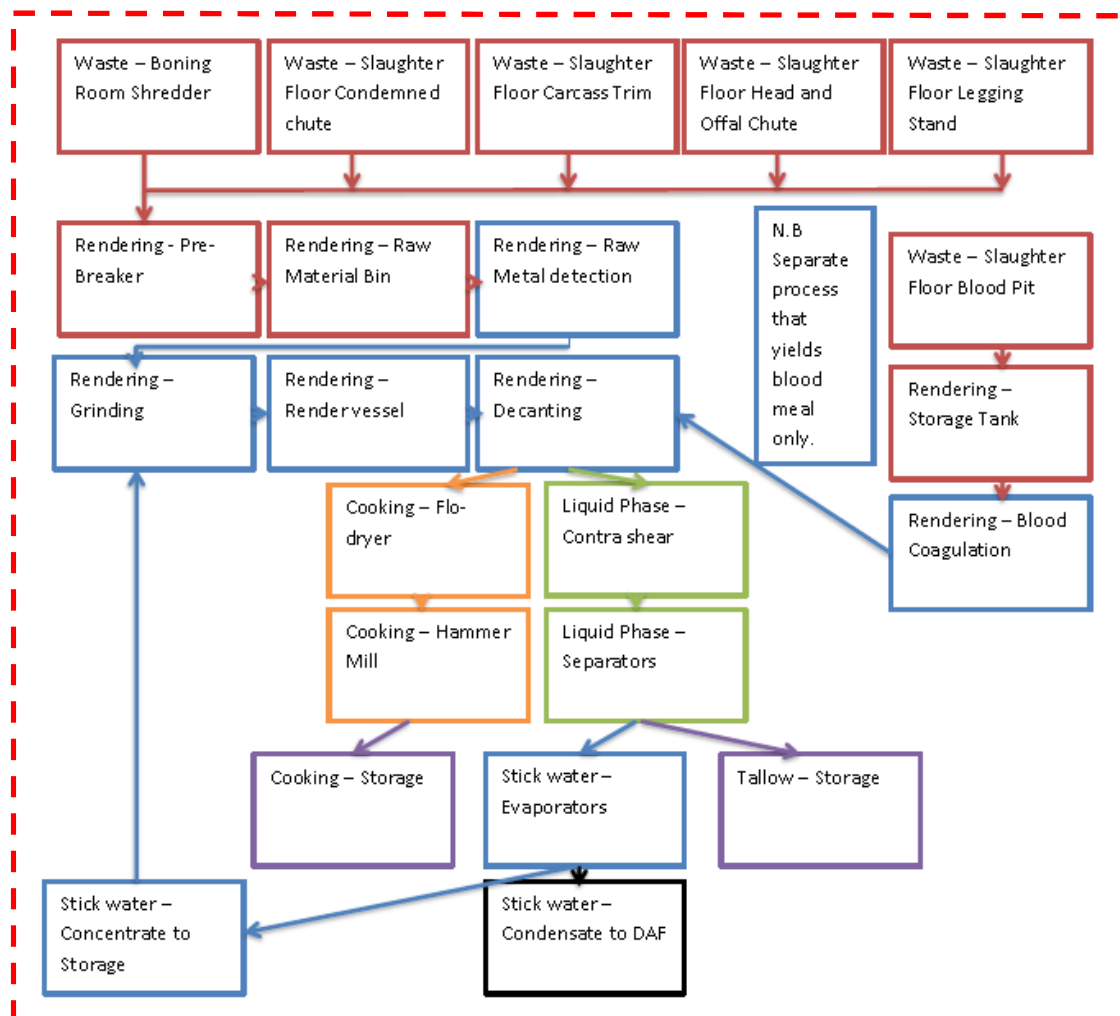


Figure 6-1: Detailed Process Flow Chart of Rendering Plant (Odorous Releases in Red Box)

6.2 OVERVIEW OF ODOUR CONTROLS

The rendering operations have been classified as having a very high odour potential. The main odour emissions will be from fugitive emissions within the building, therefore the housekeeping and equipment maintenance are essential.

Rendering Plant - High Odour Potential

Housekeeping:

Ensure the sump covers are in place and that the floor wells are free of obstructions
Ensure all equipment is cleaned every day
Ensure that all bins have lids which are closed and waste material is covered
Ensure that all pipes leading to the bio-filter are connected and maintained

Routine Controls:

Daily caustic clean of plant equipment on shut down.
Regular dry and wet cleaning of plant throughout day to remove old product/spills
CIP of Blood, tallow and stickwater separators.

Trigger Levels – Based on bio-filter manual monitoring requirements

Monitoring levels to ensure optimum performance
- Temperature of inlet gases should be <50°C
- Humidity of input gases should be >60%

Enhanced Controls:

Refer to individual equipment operations manual

Equipment Maintenance:

Ensure that the vents to the meat meal dryer are maintained
Ensure that there is no leakage from the dryers (avoiding smoke emissions)
Ensure that the stick water evaporator fan is maintained
Ensure there are spare supplies in case of a breakdown
Ensure that there is a regular maintenance schedule for all equipment

Record Keeping:

Daily check sheets
Maintenance records

The bio-filter has been classified as having a high odour potential if the micro-organisms on the media are not balanced correctly. At present a masking agent is used therefore housekeeping and routine controls requirements are essential.

Bio-filter - Low Odour Potential

Housekeeping:

Ensure the man-hole cover is in place and that the drains are free of obstructions
Ensure there are no leaks around the bio-filter
Carry out sniff tests regularly
Ensure that all pipes leading to the bio-filter are connected and maintained

Routine Controls:

Ensure that the spraying system is operating accordingly
CIP of Flo-Dryer heat exchanger to optimise cooling coefficient

Trigger Levels – Based on bio-filter manual monitoring requirements

Monitoring levels to ensure optimum performance
- Media moisture levels should be 40 – 50%
- Temperature of inlet gases should be <50°C
- Humidity of input gases should be >60%
- pH of the media should be in the range of 5 – 6
- Backpressure should be in the range 10 - 80 mm

Enhanced Controls:

Monthly testing reveal bacteria counts are >10⁵

Equipment Maintenance:

Ensure there are spare supplies of the masking agent and that the bio-filter does not operate without the masking agent
Ensure that replacement media is available in advance of the replacement time
Monthly core testing of the media to ensure that total bacteria counts are >10⁵

Record Keeping:

Daily check sheets
Laboratory testing results

6.3 OPERATIONAL PARAMETER SETTINGS

The bio-filter manual provides a number of optimal parameter settings under normal conditions. As the bio-filter input gases originate from the rendering plant, the parameter settings are the same for both the rendering plant and bio-filter.

Table 6-1: Operational Settings of the Rendering Plant and Bio-filter

| Parameter | Optimal Setting | Actions |
|---|---|--|
| Media moisture levels | 40 – 50% Bio-mass will dry out | If too low, turn on water sprays A drain is located underneath to capture excess water |
| Temperature of inlet gases from rendering plant | <50°C High temperatures will destroy the bio-mass | Temperature can be controlled via rendering control panel |
| Humidity of input gases from rendering plant | >60% | A water spray nozzle can be located in ducting to humidify the air while the fan is in operation by itself. |
| pH of the media | 5 – 6 | Can be corrected using a suitable pH stabilise |
| Backpressure | 10 - 80 mm | <ul style="list-style-type: none"> If the back pressure is below 10 mm, the gases are permeating too freely through the bed resulting in insufficient residence time for the Bio-filter to be effective. If the back pressure is too low, turn the irrigation system on to the bio-filter daily for 2 to 3 hours to raise the back pressure. Also, check that there are no obvious leaks in the bed and the concrete manholes are well sealed. If the back pressure is more than 80 mm, check that the media is not saturated by measuring the moisture content. If the moisture content is within the 30 to 50% level, then the bed may be choked and compacted. The bed may require hoeing or loosening up. High back pressure may also be due to biological build up in the plastic distributors. Access to the distributor pipes is from the edge of the bio-filter and from the main distribution pipe. |

6.4 CONTINGENCY PLANS

The operation of the bio-filter is in part based on the optimal conditions of the input gas parameters from the rendering plant. The long term efficiency of a bio-filter depends on the number of bacteria present. Therefore monthly testing is paramount to determining if the bacteria levels are sufficient.

In the event that the levels are not sufficient, ensure that the parameters are achieved by responding to any software alarms to identify the cause and determine what parameters need to be checked (i.e. bed moisture, bed pH, gas temperature etc.).

If an event kills off some of the bacteria, once the cause has been rectified, the naturally occurring bacteria should come back. Testing of the bacteria levels will determine if the bacteria levels have replenished.

6.5 RENDER PLANT AND BIO-FILTER MANAGEMENT PLAN

The following table provides the management plan for the rendering plant and bio-filter, including personnel responsible, frequency of actions and records to be completed.

Table 6-2: Render Plant and Bio-filter Management Plan

| Control Classification | Specific Tasks / Actions | Personnel Responsible | Frequency of Actions | Records to be Completed |
|------------------------|--|-------------------------------------|---|-------------------------|
| Housekeeping | Ensure the rendering sump covers are in place and that the floor wells are free of obstructions | Production Manager | Daily | Daily checklist |
| | Ensure daily checks are completed | Production Manager | Daily | Daily checklist |
| | Ensure that all bins have lids and waste material is covered | Production Manager | Daily | Daily checklist |
| | Ensure that all blood spills are cleaned as soon as possible | Production Manager | Daily | Daily checklist |
| | Ensure the bio-filter man-hole cover is in place and that the drains are free of obstructions | Production Manager | Daily | Daily checklist |
| | Ensure there are no leaks around the bio-filter | Chief Engineer | Daily | Daily checklist |
| | Carry out sniff tests regularly | Environmental Officer | Daily | Daily checklist |
| | Ensure that all pipes leading to the bio-filter are connected and maintained | Chief Engineer | Daily | Daily checklist |
| Routine Controls | Keep roller shutter doors closed | All staff | At all times | - |
| | Ensure the cleaning of all equipment is completed at the end of the shift | Production Manager | See bio-filter | Daily checklist |
| | Ensure that the spraying system is operating accordingly | Chief Engineer | Daily | Daily checklist |
| Trigger Levels | Ensure that there is a back-up storage facility where unprocessed materials can be stored until plant operations resume | Production Manager | Plant breakdown | Daily checklist |
| | Monitoring levels to ensure optimum performance: <ul style="list-style-type: none"> Media moisture levels should be 40 – 50% Temperature of inlet gases should be <50°C Humidity of input gases should be >60% pH of the media should be in the range of 5 – 6 Backpressure should be in the range 10 - 80 mm | Production Manager / Chief Engineer | At all times (using rendering plant software) | Daily checklist |
| | <ul style="list-style-type: none"> Monthly testing reveal bacteria counts are >10⁵ | Env. Officer | Monthly | Maintenance records |

| Control Classification | Specific Tasks / Actions | Personnel Responsible | Frequency of Actions | Records to be Completed |
|------------------------|---|-----------------------|----------------------|-------------------------|
| Enhanced Controls | No enhanced controls are available other than masking any odour | Chief Engineer | - | - |
| Equipment Maintenance | Ensure that the vents to the meat meal dryer are maintained | Chief Engineer | At all times | Maintenance records |
| | Ensure that there is no leakage from the dryers (avoiding smoke emissions) | Chief Engineer | At all times | Maintenance records |
| | Ensure that the stick water evaporator fan is maintained | Chief Engineer | At all times | Maintenance records |
| | Ensure that all pipes leading to the bio-filter are connected and maintained | Chief Engineer | At all times | Maintenance records |
| | Ensure there are spare supplies in case of a breakdown | Chief Engineer | At all times | Maintenance records |
| | Ensure that there is a regular maintenance schedule for all equipment | Chief Engineer | At all times | Maintenance records |
| | Ensure there are spare supplies of the masking agent and that the bio-filter does not operate without the masking agent | Chief Engineer | At all times | Maintenance records |
| | Monthly core testing of the media to ensure that total bacteria counts are $>10^5$ | Environmental Officer | Monthly | Laboratory Records |
| | Ensure that replacement media is available in advance of the replacement time | Chief Engineer | At all times | Maintenance records |

6.6 RENDERING PLANT PROCEDURES AND CHECKING REQUIREMENTS

The Operations Manual for the Rendering Plant (Appendix C) includes all of the start-up and shut down procedures for the rendering plant equipment. Please refer to this document for more information and trouble shooting.

6.7 ADDITIONAL RENDERING PLANT MAINTENANCE REQUIREMENTS

The following rendering plant maintenance requirements are to be completed by the Chief Engineer:

6.7.1 DAILY

- Grease bearings on Render vessel, Flomor pump, Decanter;
- Check air line filters & drains;
- Check metal detector and belt reject operation;
- Change the grinder knives and hole plate;
- Clean the Render Vessel and process lines;
- Check the dryer temperature probes readings during operation are similar; and
- Check the cyclone solids discharge and rotary valve run hot during operation

6.7.2 WEEKLY

- Check all drive lubrication and adjustment;
- Check glands, packing, seals for leaks;
- Check conveyor belt tension and alignment;
- Clean the dryer temperature probes;
- Check the pH probe for fouling (leave out for chemical cleaning);
- Chemically clean the Render Vessel, Decanter, liquid phase screen, tank, Separator;
- Check and clean Dryer internal lifting flights of build-up if present;
- Check the mill screens for wear, replace as required;
- Check the meal blower system and bag filter operation.

6.7.3 FORTNIGHTLY/MONTHLY

- Check the metal detector belt sensitivity and calibration;
- Check the grinder head, barrel and screw for wear;
- Check the decanter feed pump for wear and replace vanes as required;
- Check the decanter solids scroll for wear;
- Clean the liquid phase screen;
- Check the liquid phase pump stator;
- Re-calibrate the pH probe, Chemically clean the separator;
- Check the dryer, cyclone, fan and condenser for build-up.

6.7.4 1 TO 3 MONTHLY

- Check Render Vessel agitator blades for wear;
- Check tallow pumps;
- Check the dryer combustion chamber ceramic;
- Clean the dryer ducts, cyclone, fan, condenser and rotary valves;
- Check the mill hammers and pins plus the screen locating bottom bar; and
- Check the mill plenum for build-up.

6.7.5 6 MONTHS TO YEARLY

Usual annual maintenance work plus the following:

- Check the Brentwood;
- Remove and change decanter solids scroll and bowl;
- Check the mill wear plates and transitions;



- Check the meal rotary valves clearances; and
- Check the dryer infeed screw and water jacket for wear.

7 HIDES PROCESSING MANAGEMENT PLAN

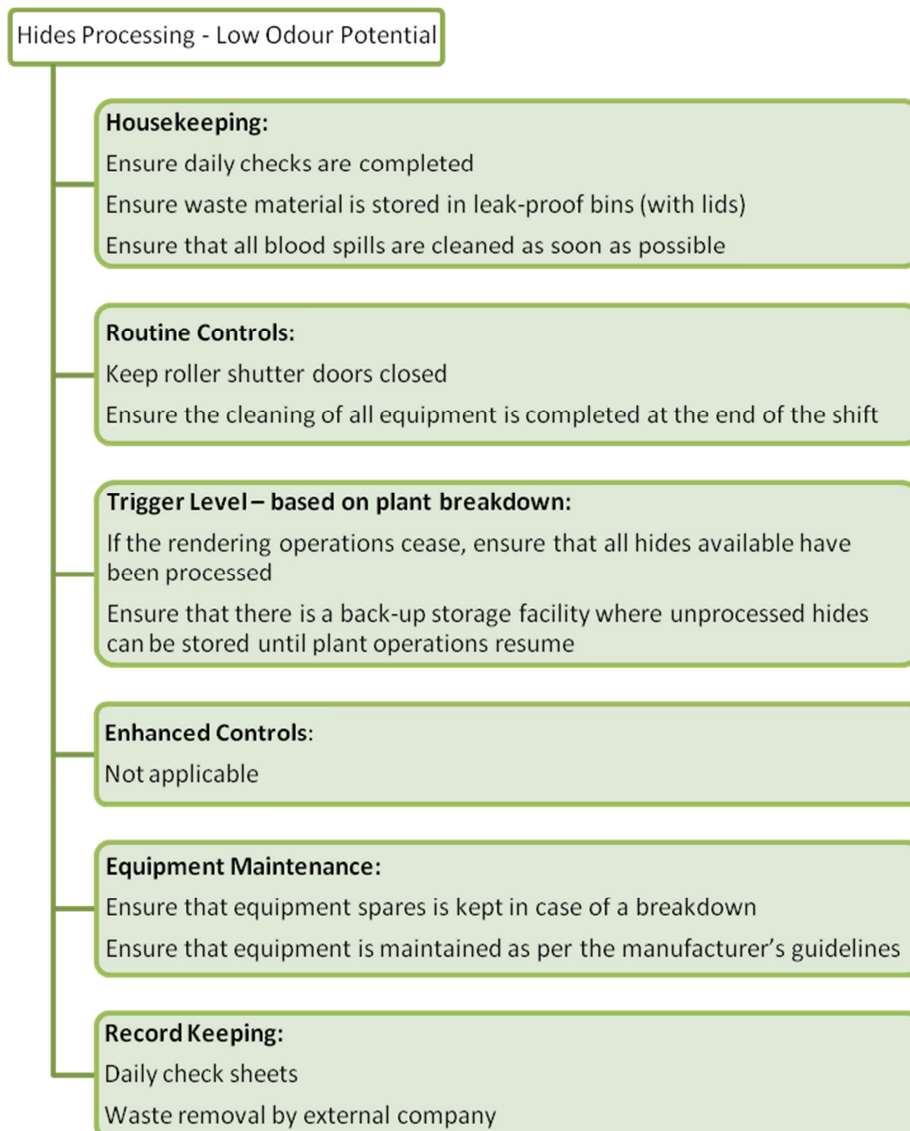
This Management Plan for hides processing operations will be made available to all staff working in this area. All staff will receive training outlining the importance of cleaning procedures and equipment maintenance.

7.1 PROCESSES

The hides shed will process the hides on the same day the cattle are killed. The shed has a maximum capacity of 2,400 hides.

7.2 OVERVIEW OF ODOUR CONTROLS

The hide processing operations have been classified as having a low odour potential. The main odour emissions will be from waste material on the floor, therefore the housekeeping procedures are essential.



7.3 OPERATIONAL PARAMETER SETTINGS

There are no operational parameters associated with hides processing.

7.4 CONTINGENCY PLANS

All hides will need to be salted within 24-hours. If a power failure or severe breakdown occurs that prevents normal operating conditions hides will be hand salted until they can be placed back into the normal process.

7.5 HIDES PROCESSING MANAGEMENT PLAN

The following table provides the management plan for the hides processing activities, including personnel responsible, frequency of actions and records to be completed.

Table 7-1: Hides Processing Management Plan

| Control Classification | Specific Tasks / Actions | Personnel Responsible | Frequency of Actions | Records to be Completed |
|------------------------|--|--------------------------|-------------------------|-------------------------|
| Housekeeping | Ensure that all blood spills are cleaned as soon as possible | All staff / Env. Officer | Daily | Daily checklist |
| | Ensure daily checks are completed | Production Manager | Daily (at end of shift) | Daily checklist |
| | Ensure waste is stored in leak-proof bins (with lids) | All staff / Env. Officer | At all times | Waste transfers |
| Routine Controls | Ensure the cleaning of all equipment is completed at the end of the shift | Production Manager | Daily (at end of shift) | Daily checklist |
| | Ensure shed is well ventilated to improve the hide drying process to prevent microbial activity that leads to foul odours. | All staff | At all times | - |
| Trigger Levels | Ensure that all hides available have been processed | Production Manager | Plant breakdown | Daily checklist |
| | SOPs for breakdown to hand salt if breakdown cannot be rectified within 24-hours | Chief Engineer | Plant breakdown | - |
| Enhanced Controls | Not applicable | | | |
| Equipment Maintenance | Ensure spare parts for all equipment are stored on-site | Chief Engineer | At all times | Maintenance record |
| | Ensure that a regular maintenance programme is developed which compliments the manufacturer's requirements | Chief Engineer | At all times | Maintenance record |

7.6 DAILY CHECK SHEET (HIDES PROCESSING)

This sheet should be printed and placed in the hides building.

| Hides Processing – Daily Checklist | | |
|---|------------|-------------------------------|
| Date: | | |
| Time: | | |
| Operator: | | |
| Pre-Work Checks | | |
| <i>Checks to be completed</i> | <i>Y/N</i> | <i>Comments</i> |
| Was cleaning completed the previous evening? | | |
| Are all bins leak-proof with bins? | | |
| Are the odours stronger than normal? | | |
| Is all mechanical equipment working correctly? | | If no, contact Chief Engineer |
| Other observations: | | |
| | | |
| During the Day | | |
| <i>Checks to be completed</i> | <i>Y/N</i> | <i>Comments</i> |
| Are blood spills cleaned regularly? | | |
| Are roller shutter doors closed? | | |
| Other observations: | | |
| | | |
| End of Day Checks | | |
| <i>Checks to be completed</i> | <i>Y/N</i> | <i>Comments</i> |
| Has cleaning been completed? | | |
| Have all hides been processed | | |
| Are the hides stored correctly? | | |
| Other observations: | | |
| | | |
| <div style="display: flex; justify-content: space-between; font-size: small;"> Northern Australian Beef Limited Version No: 1 Page 1 of 1 </div> <div style="display: flex; justify-content: space-between; font-size: x-small; margin-top: 5px;"> Authorised By: Compliance/General Manager Innovation and Technology Date of Revision: 25th Nov 2015 </div> | | |

8 WASTEWATER TREATMENT MANAGEMENT PLAN

This Management Plan for wastewater treatment will be made available to all staff working in this area. All staff will receive training outlining the importance of housekeeping procedures and equipment maintenance. This WWTP management plan is for the existing facility and not the proposed upgrade. This plan will be updated prior to commissioning of Stage 1 of the upgraded plant.

8.1 PROCESSES AND ODOUR

Current wastewater flows at the Facility are in the order of 0.8 - 1 ML per day, for processing cattle. The main odour emissions are when the wastewater is exposed to the air (i.e. open sumps, DAF and sludge). The performance of the DAF and other treatment processes is essential to the quality of water (and thus the odour emissions) that is irrigated. These processes are identified in Figure 8-1.

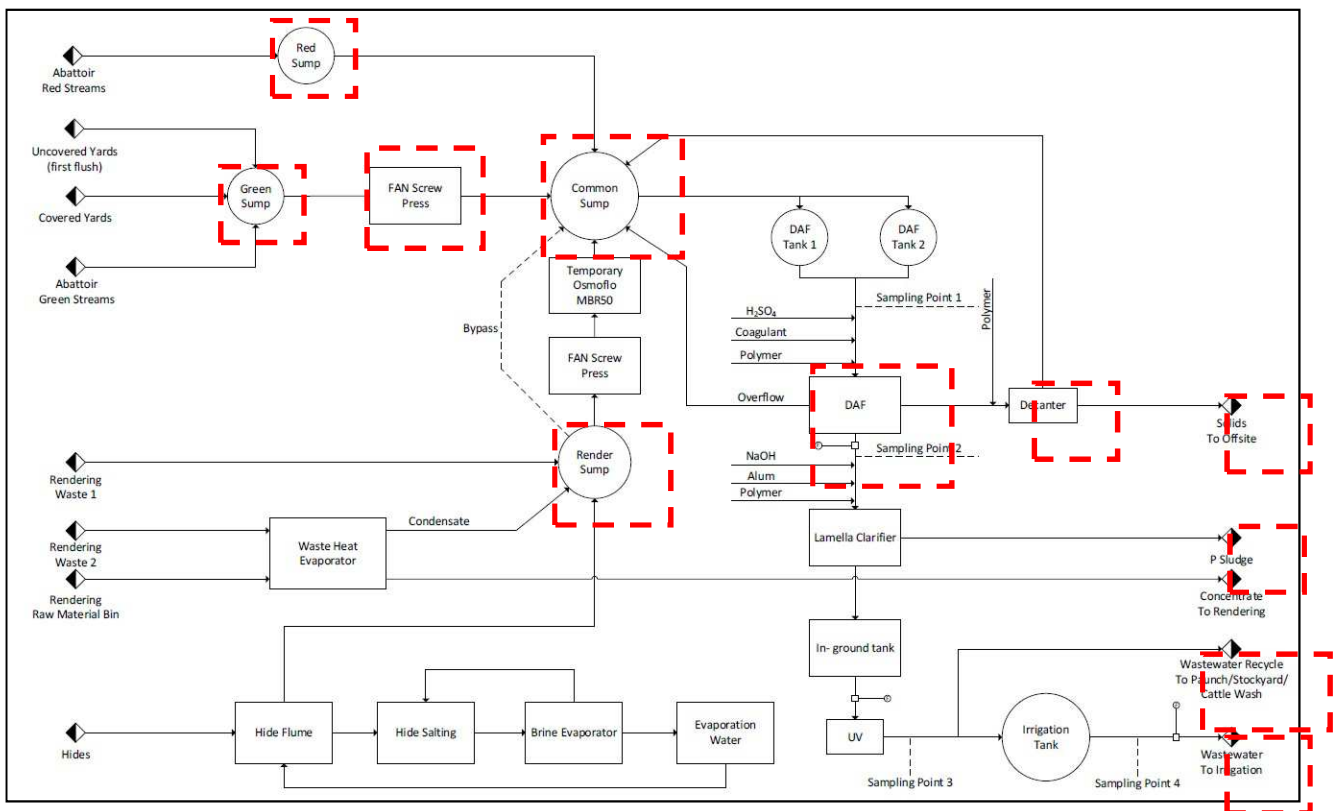
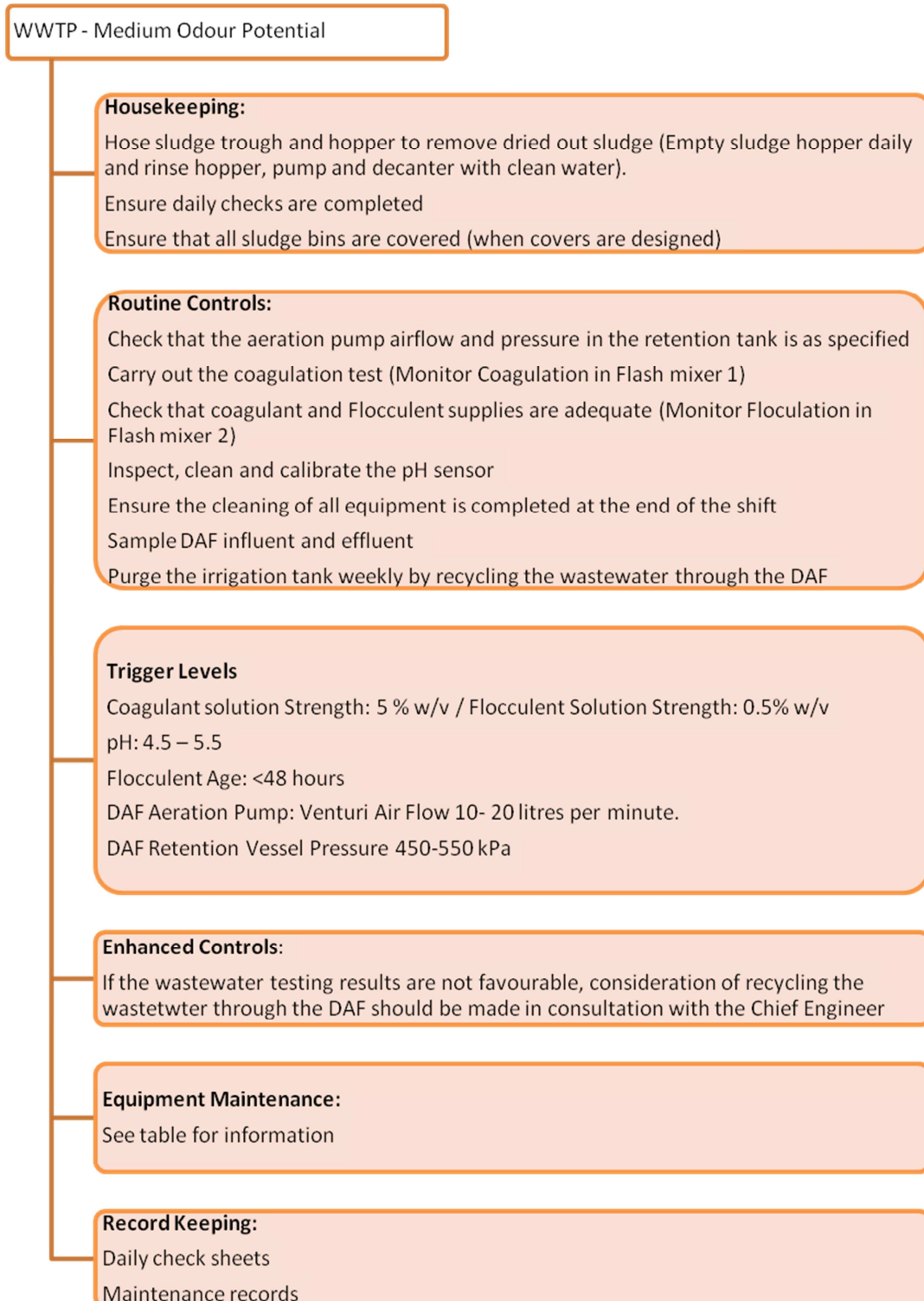


Figure 8-1: Detailed Process Flow Chart for Wastewater (Odourous Releases in Red Boxes)

8.2 OVERVIEW OF ODOUR CONTROLS

The wastewater treatment has been classified as having a very high odour potential. The main odour emissions are from the DAF, sludge bins and irrigation of the wastewater, therefore the maintenance of equipment, optimal operation and housekeeping are essential.



8.3 OPERATIONAL PARAMETER SETTINGS (WASTEWATER TREATMENT)

The operations manual for the wastewater treatment plant provides a number of settings. Most of the systems are automatic, however they can be overridden unless faults have been identified.

Table 8-1: Operational Parameter Settings for Wastewater Treatment

| Parameter | Requirement | Actions |
|---------------------------------------|--|---|
| Balancing Tank Selection | Tank A to be duty selected and valves left in automatic | Valves should only be manually overridden when a fault occurs. DAF operation commences once the duty balance tank reaches 50% and Stops at 25%. Once full the standby tank is opened. |
| DAF pH and Coagulation Dosing Chamber | pH: 4.5 – 5.5 | Adjust pump speed, calibrate pH probe. |
| | Coagulant solution Strength: 5 % w/v | Alter the speed of the coagulant feed auger thereby increasing or decreasing the strength of the coagulant solution. |
| DAF Flocculent System | Flocculent Solution Strength: 0.5% w/v | Selected by feed time and speed. Parameters to be set by chemical supply technician |
| | Pump: VFD setting 20 to 60 Hertz. | Adjust accordingly |
| | Flocculent Age: <48 hours | Replace |
| DAF Chemical dilution valves | Flocculent water addition: 30% open | Open / close accordingly |
| DAF Aeration Pump | Suction valve full open. | Open accordingly |
| | Delivery valve full open. | Open accordingly |
| | Venturi bypass valves full open | Open accordingly |
| | Venturi Air Flow 10- 20 litres per minute. | Adjust accordingly |
| | Retention Vessel Pressure 450-550 kPa | Adjust accordingly |
| DAF Scraper | VFD setting 15 to 30 Hertz. | Adjust accordingly |
| DAF Sparge Valve Settings | Valve 1: 40% Valve 2: 40% Valve 3: 50% Valve 4: 40% | Adjust accordingly |
| DAF Discharge Pump | Automated speed control | Maintain level in the discharge chamber |

8.4 CONTINGENCY PLANS

The wastewater treatment plant has a variety of sensors and monitors that continuously check the operation of the plant. These checks include the flow rates, pressures and levels at various points in the plant. When the levels fall out of set parameters, DAF system alarms are sounded. These alarms are detailed in Table 8-2.

The only faults that will shut down the plant will be if the flocculent batch units are low; the plant will shut down after 15 mins if not topped up.

Table 8-2: DAF System Alarms

| Ref | Alarm Cause | Alarm Message | Action |
|-----|-----------------------------------|-----------------------------|---|
| 1 | Retention Tank Pressure Switch | Retention Tank Low Pressure | Plant Shut Down |
| 2 | DAF Polymer Hopper Probe | Poly Hopper Low level | Alarm Plant |
| | | | Plant Shutdown in 15 minutes |
| 3 | DAF Floc. Storage Tank Low Level | Floc Storage Tank Low Level | Plant Shut Down |
| 4 | DAF Sludge Tank High Level Probe | Sludge Tank at Hi Level | Stop Scrapers Stop inlet, coagulant and floc pumps |
| 5 | DAF Sludge Tank Low Level Probe | Sludge Tank at Low Level | Stop sludge pump |
| 6 | Balance Tank TK-D104A Level Probe | Balance Tank Low Level | Automatic Plant Shut Down |
| 7 | Balance Tank TK-D104A Level Probe | Balance Tank High Level | Alarm Plant |
| 8 | Balance Tank TK-D104B Level Probe | Balance Tank Low Level | Automatic Plant Shut Down |
| 9 | Balance Tank TK-D104B Level Probe | Balance Tank High Level | Alarm Plant |
| 10 | DAF Discharge Chamber Low Level | Low Level (extended) | Plant Shut Down |
| 11 | DAF Coagulation Tank Level Probe | Low Level (extended) | Alarm Plant |

8.5 WASTEWATER TREATMENT PLANT MANAGEMENT PLAN

The following table provides the management plan for the wastewater treatment plant, including personnel responsible, frequency of actions and records to be completed. Detailed equipment maintenance is summarised in weekly, fortnightly, monthly, six monthly, annually and biannually as per the Haarslev operational manual.

Table 8-3: Wastewater Management Plan

| Control Classification | Specific Tasks / Actions | Personnel Responsible | Frequency of Actions | Records to be Completed |
|------------------------|--|---|---------------------------|-------------------------|
| Housekeeping | Hose sludge trough and hopper to remove dried out sludge | All Staff | Daily | Daily checklist |
| | Ensure daily checks are completed | Production Manager | Daily | Daily checklist |
| | Ensure that all sludge bins are covered (when covers are designed) | Production Manager | Daily | Daily checklist |
| Routine Controls | Visual inspection of all pumps throughout the day | Production Manager | All day | Daily checklist |
| | Check that the aeration pump airflow and pressure in the retention tank is as specified | Chief Engineer | Daily | Maintenance records |
| | Carry out the coagulation test | Environmental Officer | Daily | Daily checklist |
| | Check that coagulant and flocculent supplies are adequate | Chief Engineer | Daily | Daily checklist |
| | Inspect and clean the pH sensor | Chief Engineer | Daily | Daily checklist |
| | Ensure the cleaning of all equipment is completed at the end of the shift | Production Manager | Daily | Daily checklist |
| | Sample DAF influent and effluent (see site sheets below) | Environmental Officer | Daily | Daily checklist |
| | Purge the irrigation tank by recycling the wastewater through the DAF | Chief Engineer | Weekly | Maintenance records |
| Trigger Levels | Coagulant solution Strength: 5 % w/v | Production Manager | Daily | Daily checklist |
| | Flocculent Solution Strength: 0.5% w/v | Production Manager | Daily | Daily checklist |
| | pH: 4.5 – 5.5 | Production Manager | Hourly at Site 1, 2 and 4 | Daily checklist |
| | Flocculent Age: <48 hours | Production Manager | Daily | Daily checklist |
| | DAF Aeration Pump: Venturi Air Flow 10- 20 litres per minute. | Production Manager | Daily | Daily checklist |
| | DAF Retention Vessel Pressure 450-550 kPa | Production Manager | Daily | Daily checklist |
| Enhanced Controls | If the wastewater testing results are not favourable, consideration of recycling the wastewater through the DAF. | Env. Officer with Chief Engineer approval | When required | Daily checklist |
| Equipment Maintenance | Ensure the integrity of all pipes | Chief Engineer | Daily | Maintenance records |
| | Ensure there are spare supplies in case of a breakdown | Chief Engineer | At all times | Maintenance records |

| Control Classification | Specific Tasks / Actions | Personnel Responsible | Frequency of Actions | Records to be Completed |
|------------------------|--|-----------------------|----------------------|-------------------------|
| Equipment Maintenance | Inlet pump and aeration pump: Check seal leakage rate and tighten if rate greater than 15 drops per minute. | Chief Engineer | Weekly | Maintenance records |
| | DAF Scraper Chain: Lubricant Chain Joints | Chief Engineer | Weekly | Maintenance records |
| | Flocculent System: Check operation and control of the water supply system. Clean and replace any component not operational. | Chief Engineer | Weekly | Maintenance records |
| | DAF Coagulant Pump and Flocculent Pump: Check pump visually whilst in operation. | Chief Engineer | Weekly | Maintenance records |
| | DAF Coagulant Pump and Flocculent Pump: Check pump delivery rate. If not satisfactorily check speed control setting followed by pump and valve connections etc. | Chief Engineer | Fortnightly | Maintenance records |
| | Sludge Pump: Check pump delivery rate. If not satisfactory inspect rotor and stator internally. | Chief Engineer | Monthly | Maintenance records |
| | Grease DAF Scraper Bearings | Chief Engineer | Six monthly | Maintenance records |
| | DAF Coagulant Mixer: Replace mixer bearing and seal | Chief Engineer | Six monthly | Maintenance records |
| | Coagulant Tank Mixer Replace mixer bearing and seal. | Chief Engineer | Six monthly | Maintenance records |
| | DAF Chain Support Strips: Check for wear on chain support strip. Arrange to replace if necessary. | Chief Engineer | Six monthly | Maintenance records |
| | DAF Scraper Drive and Flocculent Blender: Check lubricant level. Sample lubricant quality and replace if not clean. | Chief Engineer | Six monthly | Maintenance records |
| | Coagulant Feeder and Flocculent Feeder: Replace feeder seal assembly. | Chief Engineer | Annually | Maintenance records |
| | Coagulant Pump: Replace diaphragm and seals | Chief Engineer | Annually | Maintenance records |
| | DAF Flocculent Pump and Sludge Flocculent Pump: Strip pump and replace worn or damaged components. | Chief Engineer | Annually | Maintenance records |
| | Inlet Pump and Aeration Pump: Replace bearings. | Chief Engineer | Biannually | Maintenance records |
| | Coagulant Feeder and Flocculent Feeder: Replace gear reducer lubricant and drive bearings. | Chief Engineer | Biannually | Maintenance records |



| Control Classification | Specific Tasks / Actions | Personnel Responsible | Frequency of Actions | Records to be Completed |
|------------------------|---|-----------------------|----------------------|-------------------------|
| | DAF Scraper Drive, Flocculent Blender and Flocculent Mixers: Replace gear reducer lubricant. | Chief Engineer | Biannually | Maintenance records |

8.6 COAGULATION TEST

Follow these steps to complete a DAF coagulation test:

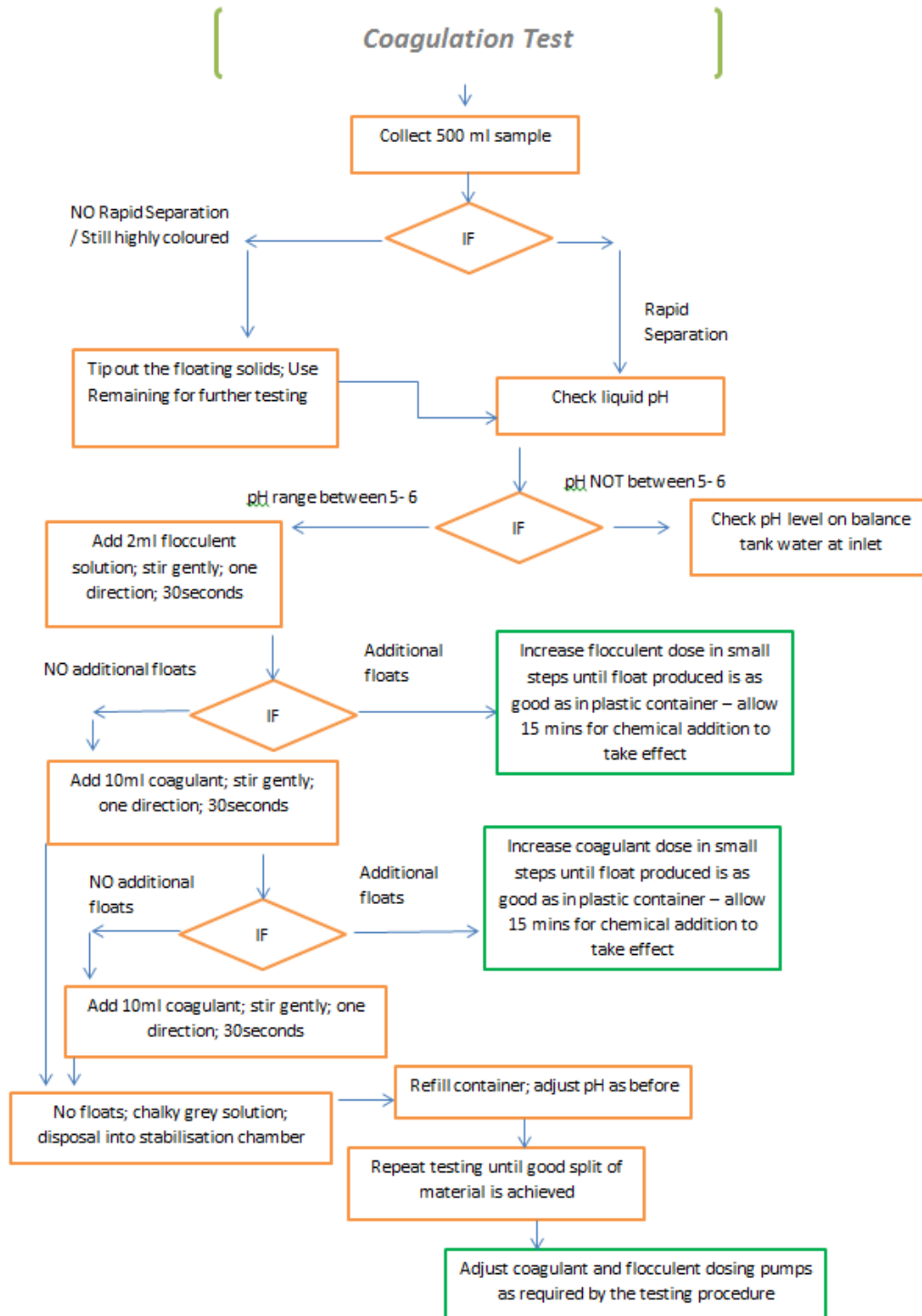


Figure 8-2: Coagulation Test Flow Chart

8.7 CHECK SHEETS

There are three separate check/data collection sheets for the wastewater treatment plant:



- Start-up log sheet to be completed each morning;
- Shut down log sheet to be completed each evening; and
- Process flow quality assurance log data sheet for the four wastewater tests sites as per the EPL 131.

Waste Water Treatment Plant; Start Up

| | | |
|-----------|--------------------------|----------------|
| Date: | Meter Readings | |
| Time: | Potable Water: | m ³ |
| Operator: | Site 1 (DAF): | m ³ |
| | Site 3 (Recycled Water): | m ³ |
| | Site 4 (Irrigation): | m ³ |

| Product Flow | | |
|--|-----|----------|
| Location | Y/N | Comments |
| Red Sump | | |
| Level | | |
| Pump Check (Flow, Oil, Levels) | | |
| Fan Press (Clean, Inspect) | | |
| Green Sump | | |
| Level | | |
| Pump Check (Flow, Oil, Levels) | | |
| Fan Press (Clean, Inspect) | | |
| Agitator | | |
| Recycled Water (paunch Room, Corner drain, IO's) | | |
| Common Sump | | |
| Level | | |
| Pump Check | | |
| Final Sump/Recycled water | | |
| Level | | |
| Pump Check | | |
| UV intensity | | |

| Operations | | | |
|---------------------------|--|---------|---------|
| <i>Equipment</i> | | | |
| DAF | | | |
| Balance Tank level | | Tank A: | Tank B: |
| pH (4.2-5.0) | | | |
| Aeration (>5.3 Bar) | | | |
| Coagulant (level etc.) | | | |
| Flocculent (level, clean) | | | |
| Lamella | | | |
| pH (6.5-8.0) | | | |
| Coagulant | | | |
| Flocculent | | | |
| Sludge Level | | | |
| Decanter | | | |
| Start up | | | |
| Greasing | | | |
| Safety | | | |
| Emergency Shower | | | |
| PPE | | | |



| INCOMING RAW INFFLUENT | | | | | | | |
|------------------------|------------------|--------------------|-----------------------|---------------------|----------------|---------------------|----------|
| Date: | Operator: | | monitoring parameters | | | | Site- 1 |
| Time | Killing (Y/N) | Renderin g(Y/N) | Cleaning (Y/N) | Irrigating (Y/N) | pH (hourly) | Temp oC (hourly) | Comments |
| 0:00:00 | | | | | | | |
| 1:00:00 | | | | | | | |
| 2:00:00 | | | | | | | |
| 3:00:00 | | | | | | | |
| 4:00:00 | | | | | | | |
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| 12:00:00 | | | | | | | |
| 13:00:00 | | | | | | | |
| 14:00:00 | | | | | | | |
| 15:00:00 | | | | | | | |
| 16:00:00 | | | | | | | |
| 17:00:00 | | | | | | | |
| 18:00:00 | | | | | | | |
| 19:00:00 | | | | | | | |
| 20:00:00 | | | | | | | |
| 21:00:00 | | | | | | | |
| 22:00:00 | | | | | | | |

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Site 1 - Incoming Raw Effluent Check Sheets

| DISSOLVED AIR FLOTATION SYSTEM | | | | | | | | | |
|--------------------------------|----------------------|-----------------------|-----------------------|-----------------------------|---------------------------|-----------------------------|----------------|---------------------|----------|
| Date: | Operator: | | monitoring parameters | | | | | | Site- 2 |
| Time | Log Auger (Hz) | Poly Auger (Hz) | Poly Pump (Hz) | Pump (strokes/ depth) | Aeration Pump (Bar) | M803- Discharg e (KL) | pH (hourly) | Temp oC (hourly) | Comments |
| 0:00:00 | | | | | | | | | |
| 1:00:00 | | | | | | | | | |
| 2:00:00 | | | | | | | | | |
| 3:00:00 | | | | | | | | | |
| 4:00:00 | | | | | | | | | |
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| 19:00:00 | | | | | | | | | |
| 20:00:00 | | | | | | | | | |
| 21:00:00 | | | | | | | | | |
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| 23:00:00 | | | | | | | | | |

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Site 2 - DAF Check Sheets



| LAMELLA WASTEWATER PROCESSING SYSTEM | | | | | | | | | | | | | |
|--------------------------------------|---------------|-------------------------|------------------------|--|--------------------------|----|------|----------|---------|--------------|---------|------------------|----------|
| Date: | | Operator: | | monitoring parameters | | | | | | | | Site- 3 | |
| Time | Alum Auger | M855-Poly Auger (Hz) | M856-Poly Pump (Hz) | Caustic Pump (strokes/d eprh) | UV Intensity (>49) | pH | DO % | EC uS/cm | TDS g/L | Salinity ppt | Temp oC | Turbidity NTU | Comments |
| 0:00:00 | | | | | | | | | | | | | |
| 1:00:00 | | | | | | | | | | | | | |
| 2:00:00 | | | | | | | | | | | | | |
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| 8:00:00 | | | | | | | | | | | | | |
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| 10:00:00 | | | | | | | | | | | | | |
| 11:00:00 | | | | | | | | | | | | | |
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| 19:00:00 | | | | | | | | | | | | | |
| 20:00:00 | | | | | | | | | | | | | |
| 21:00:00 | | | | | | | | | | | | | |
| 22:00:00 | | | | | | | | | | | | | |

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Site 3 - Lamella Wastewater Processing System

| PROCESSED WATER - IRRIGATION | | | | | | | | | |
|------------------------------|---------------------------------|----------------|-----------|-----------------------|------------|-----------------|---------------------|------------------|----------|
| Date: | | Operator: | | monitoring parameters | | | | | Site- 4 |
| Time | Caustic Pump (strokes/depth) | pH (hourly) | DO ppm | EC uS/cm | TDS ppt | Salinity ppt | Temp oC (hourly) | Turbidity NTU | Comments |
| 0:00:00 | | | | | | | | | |
| 1:00:00 | | | | | | | | | |
| 2:00:00 | | | | | | | | | |
| 3:00:00 | | | | | | | | | |
| 4:00:00 | | | | | | | | | |
| 5:00:00 | | | | | | | | | |
| 6:00:00 | | | | | | | | | |
| 7:00:00 | | | | | | | | | |
| 8:00:00 | | | | | | | | | |
| 9:00:00 | | | | | | | | | |
| 10:00:00 | | | | | | | | | |
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| 14:00:00 | | | | | | | | | |
| 15:00:00 | | | | | | | | | |
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| 18:00:00 | | | | | | | | | |
| 19:00:00 | | | | | | | | | |
| 20:00:00 | | | | | | | | | |
| 21:00:00 | | | | | | | | | |
| 22:00:00 | | | | | | | | | |
| 23:00:00 | | | | | | | | | |

***Data required to be recorded two hourly (not applicable for pH and Temperature measurements)

This work place daily checklist fulfils a commitment of the NABL – Irrigation Management Plan (IMP) accordance to the Environmental Protection Licence 131 (EPL 131), condition 34.

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Site 4 - Processed Water - Irrigation

Waste Water Treatment Plant; Shut Down

| | | |
|-----------|--------------------------|----------------|
| Date: | Meter Readings | |
| Time: | Potable Water: | m ³ |
| Operator: | Site 1 (DAF): | m ³ |
| | Site 3 (Recycled Water): | m ³ |
| | Site 4 (Irrigation): | m ³ |

| Product Flow | | |
|--|-----|-----------------|
| Location | Y/N | Comments |
| Red Sump | | |
| Level | | |
| Pump Check (Flow, Oil, Levels) | | |
| Fan Press (Clean, Inspect) | | |
| Green Sump | | |
| Level | | |
| Pump Check (Flow, Oil, Levels) | | |
| Fan Press (Clean, Inspect) | | |
| Agitator | | |
| Recycled Water (paunch Room, Corner drain, IO's) | | |
| Common Sump | | |
| Level | | |
| Pump Check | | |
| Final Sump/Recycled water | | |
| Level | | |
| Pump Check | | |
| UV intensity | | |
| Operations | | |
| Equipment | | |
| DAF | | |
| Balance Tank level | | Tank A: Tank B: |
| pH (4.2-5.0) | | |
| Aeration (>5.3 Bar) | | |
| Coagulant (level etc.) | | |
| Flocculent (level, clean) | | |
| Lamella | | |
| pH (6.5-8.0) | | |
| Coagulant | | |
| Flocculent | | |
| Sludge Level | | |
| Decanter | | |
| Start up | | |
| Greasing | | |
| Safety | | |
| Emergency Shower | | |
| PPE | | |

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Compliance/General Manager Innovation and Technology

Date of Revision:

10th Sep 2015

16 Dec 2015

9 IRRIGATION MANAGEMENT PLAN

This Management Plan irrigation will be made available to all staff working in this area. All staff will receive training outlining the importance of housekeeping procedures and equipment maintenance.

An Irrigation Management Procedure document contains four procedures that appear to be written to apply to after the WWTP and wet season storage upgrade are completed. Mike Johns of Johns Environmental has reviewed the procedures and has made the recommendation that the procedures should be rewritten in consultation with NT EPA.

9.1 APPROVED IRRIGATION AREAS

The approved irrigation areas are presented in Figure 9-1. It should be noted that irrigation in the southern area has ceased.

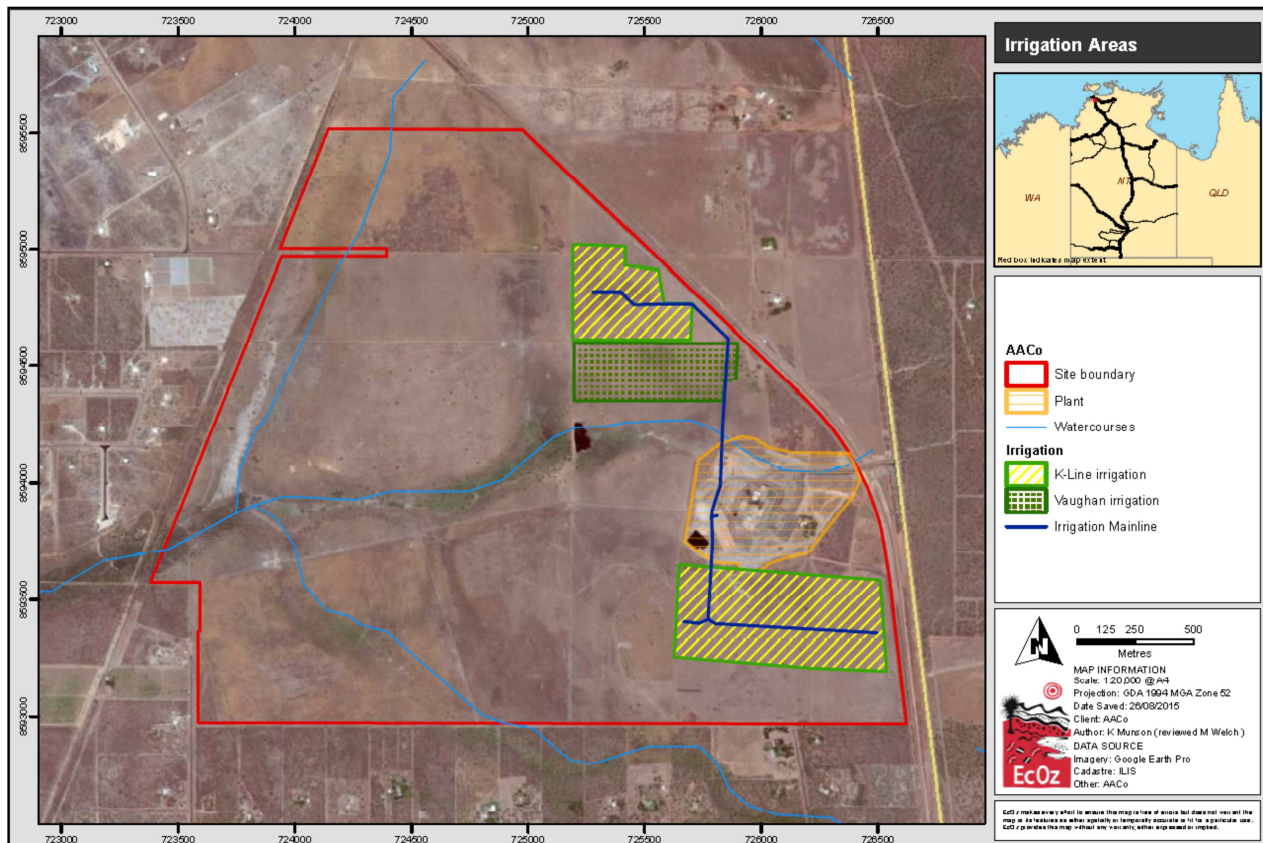
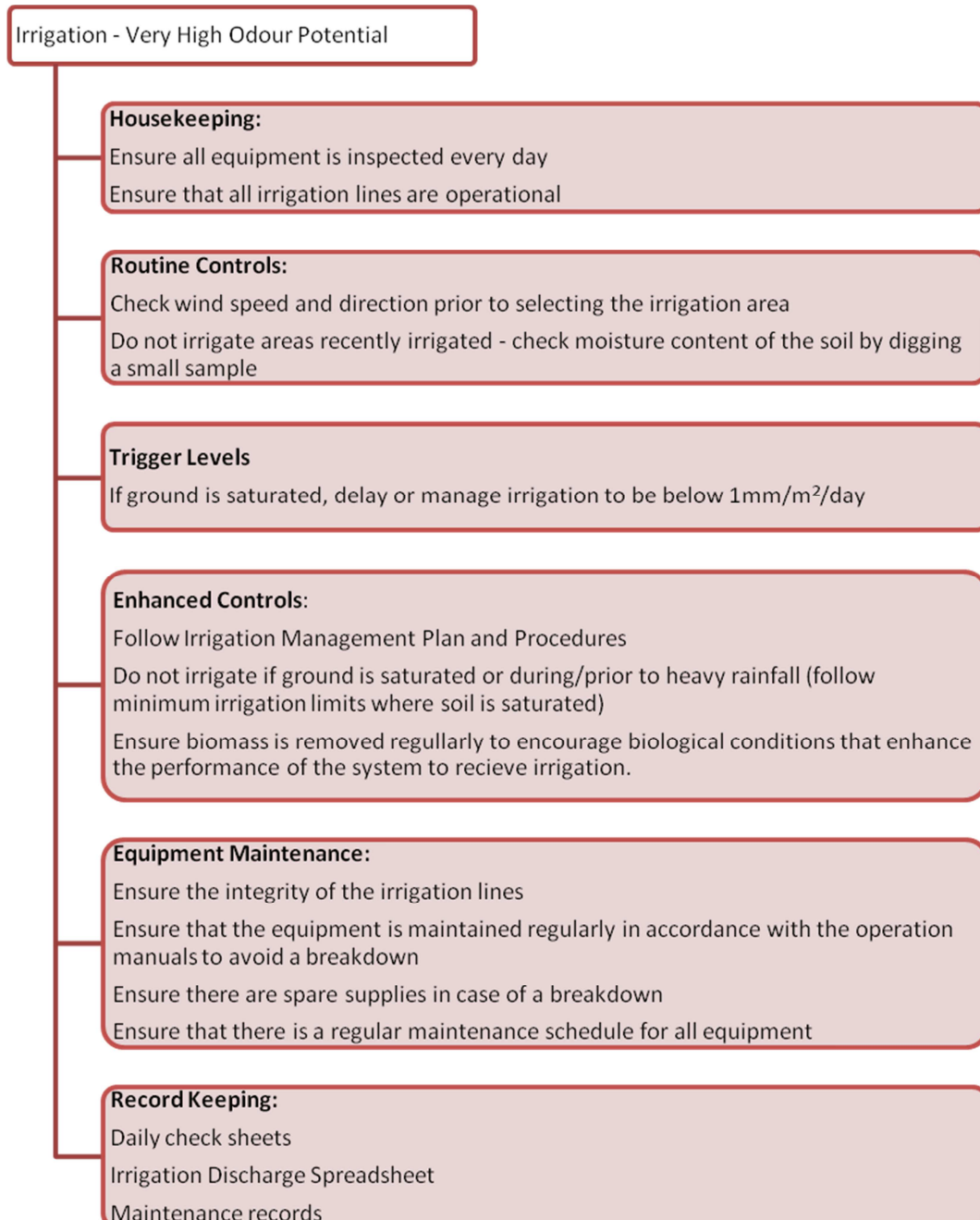


Figure 9-1: Approved Treated Effluent Irrigation Areas

9.2 OVERVIEW OF ODOUR CONTROLS

The irrigation of wastewater has been classified as having a very high odour potential and this relates to the performance of the wastewater treatment plant. As the irrigation system is automatic, the main management relates to site selection, weather conditions, soil saturation and wastewater quality.



9.3 OPERATIONAL PARAMETER SETTINGS (WASTEWATER TREATMENT)

The control of wastewater parameters are not able to be controlled at the point of irrigation. Only the site selection, disposal rate, soil saturation and weather conditions can be managed.

Technically, the operational parameters for the irrigation are the wastewater contamination levels listed in the EPL 131; however as discussed in the Audit these levels cannot be achieved with the current equipment. The operational parameters for the irrigation in Table 9-1 are the achievable levels for the equipment installed according to Haarslev, based on processing 1,500 m³/day.

Table 9-1: Operational Parameter Settings for Wastewater Irrigation

| Parameter | Achievable DAF Outlet (mg/L) | EPL 131 Licence Condition |
|-------------------------------|------------------------------|---------------------------|
| Total Suspended Solids (TSS) | 300 | 30 |
| Total Solids (TS) | 640 | - |
| BOD ₅ | 800 | 20 |
| Oils and Greases (O&G) | 50 | - |
| Total Kjeldahl Nitrogen (TKN) | 75 - 100 | 15 |
| pH | 6.0 – 6.5 | 6.5 - 8.5 |

9.4 CONTINGENCY PLANS

If the wastewater tests at Site 4 identify higher parameter levels compared to the achievable levels, the wastewater in the irrigation tank can be re-treated by either returning it to the irrigation tank, or operating the by-pass and recycling the water.

9.5 IRRIGATION MANAGEMENT PLAN

The following table provides the management plan for the irrigation of wastewater, including personnel responsible, frequency of actions and records to be completed.

| Control Classification | Specific Tasks / Actions | Personnel Responsible | Frequency of Actions | Records to be Completed |
|------------------------|--|--------------------------------------|------------------------|--------------------------------|
| Housekeeping | Ensure all equipment is inspected every day to ensure no blockages in pipes | Irrigation Supervisor | Daily | Daily checklist |
| | Ensure that all irrigation lines are operational | Irrigation Supervisor | Daily | Daily checklist |
| Routine Controls | Check wind speed and direction prior to selecting the irrigation area | Env. Officer | At all times | - |
| | Do not irrigate areas that are waterlogged | Env. Officer | Daily | Daily checklist |
| Trigger Levels | If the Site 4 wastewater parameters are much higher than the achievable levels, recycle the water through the DAF. | Env. Officer / Irrigation Supervisor | At all times | Daily checklist / test results |
| | If the ground is saturated, delay irrigation or that the volume is <1 mm/m ² /day | Irrigation Supervisor / Env. Officer | Daily | Daily checklist |
| Enhanced Controls | Do not irrigate if ground is saturated or during/prior to heavy rainfall | Irrigation Supervisor | During adverse weather | Daily checklist |
| Equipment Maintenance | Ensure the integrity of the irrigation lines | Chief Engineer | At all times | Maintenance records |
| | Ensure that the equipment is maintained regularly in accordance with the operation manuals to avoid a breakdown | Chief Engineer | At all times | Maintenance records |
| | Ensure there are spare supplies in case of a breakdown | Chief Engineer | At all times | Maintenance records |
| | Ensure that there is a regular maintenance schedule for all equipment | Chief Engineer | At all times | Maintenance records |



9.6 IRRIGATION DISCHARGE SCHEDULE


The following spreadsheet is to be filled in daily by the Irrigation Supervisor.

Table 9-2: Irrigation Discharge Schedule

| AACo. Livingstone Beef | | | | | |
|--|-------------------|-----------------------------|---|-------------------------------|---|
| By-Products; Waste Water Irrigation Log | | | | | |
| Date: | | | | | |
| Operator: | | | | | |
| Initial: | | | | | |
| <i>N.B Daily weather report must be attached to this document.</i> | | | | | |
| Time | (B) Meter Reading | (C) Total Discharge = B2-B1 | Area (m ²) = (No. Pods x 452m2) | Application Rate (mm/m2)= C÷D | Check for soil saturation, runoff and ponding or Equipment defects. |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Comments: | | | | | |

Appendix A COMPLAINTS HANDLING PROCEDURE (DRAFT)

It should be noted that this Complaints Handling Procedure has recently been revised and will become part of the Quality Assurance system in due course.

| | | |
|---|---|--------------------------------------|
|  | Northern Australian Beef Limited | |
| | DRAFT | |
| | Subject: | Complaints Handling Procedure |
| | Document No: | |

- 1. Purpose**

The primary objective of this plan is to describe the standard procedure to handle community complaints internally within the Northern Australian Beef Limited Facility.
- 2. Scope**

This plan extends to trained staff members who are responsible for handling community complaints due to nuisance caused by NABL facility operations.
- 3. Definitions**

NABL- Northern Australian Beef Limited
 NT EPA - Northern Territory Environmental Protection Authority
 AOAS – Ambient Odour Assessment Survey
 EPL 131- Environmental Protection License 131
- 4. Background**

This particular complaints handling procedure defines the standard procedure for handling community complaints. In addition, it defines the required information that needs to be collected from all complainants in order to conduct an effective ambient odour monitoring survey.
- 5. References**

Community complaints form – [Appendix 1](#)
 AOAS – [Appendix 2](#)
- 6. Responsibility**

Plant manager:

 - Supply and maintain resources to ensure this procedure is implemented correctly

Environmental Officer

 - Ensure following a significant complaint event ambient odour monitoring is being conducted
 - Ensure all complaints are recorded in the complaints register
 - Ensure NABL management is notified of findings following all surveys conducted in response to all significant odour complaint events.


| | | |
|--|---|-------------|
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| | | |
|---|----------------------------------|-------------------------------|
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| | DRAFT | |
| | Subject: | Complaints Handling Procedure |
| | Document No: | |

7. Methodology

| Methods | Complaints handling procedure | Responsible person |
|--|---|---|
| <p>complaints can be made;</p> <ul style="list-style-type: none"> Through community complaints form, which can be accessed from the NABL website or by contacting environmental@aaaco.com.au Through the 24 hour contact 0428096952 | <p>Information required to be gathered from the complainant regarding the complaint as listed on the community complaint form- Appendix 1</p> | <p>Steve Rutter Glenn Bulloch David Sneddon</p> |
| <p>Conduct an AOAS in regards to complaints of environmental odour nuisance. During day light hours – immediately During afterhours - By emergency environmental contact on 0428096952</p> | <p>Refer to Ambient Odour Monitoring Survey methods- Appendix 2</p> | <p>Yeresha Herath</p> |
| <p>Report findings of the survey within 24 hours to NABL management and NT EPA</p> | <p>Report findings of each odour survey in a report form.</p> | <p>Yeresha Herath</p> |
| <p>Record all complaints in the NABL complaints register (NABL drive-compliance-quality assurance-documentation-environmental-registers-NABL complaints register-complaints register)</p> | <p>Keep records of all complaints in the NABL complaints register as per condition 14 of the EPL 131</p> | <p>Yeresha Herath</p> |

| | | | |
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| | Document No: | |

8. Monitoring;

All complaints will be recorded in the NABL complaints register for further investigations

During the Ambient odour assessment survey any identified odour sources will be improved immediately by improving operations to minimize or mitigate the odour production.

9. **Corrective Action**

During a significant community complaints event conduct an Ambient Odour Assessment Survey as soon as practicable.

Complete an ambient odour assessment report following the survey

Notify the NT EPA of the findings and mitigation measures NABL will take to minimise or to mitigate the odour production as per standard non-compliance reporting.


10. **Records**

Complaints register
Odour monitoring reports

11. **Verification**

Annual return of the complaints register.

| | | | |
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|---|---|---------------------------------|
|  | Northern Australian Beef Limited | |
| | Subject: | Ambient Odour Assessment Survey |
| | Document No: | |

1. Purpose

Odour emissions from the NABL facility have generated allegations of environmental nuisance by members of the local community. As a result, an Ambient Odour Assessment Survey (AOAS) management plan has been developed to provide a robust and consistent survey procedure when:

- Responding to allegations of odour nuisance;
- Documenting the findings; and
- Reporting the findings to the appropriate authorities.

This survey procedure will offer transparency in the investigation of complaints and provide confidence to all stakeholders that the information gathered should withstand legal scrutiny. Furthermore, the information gathered may provide a basis by which corrective actions within the NABL facility can be derived.

2. Scope

NABL will implement the Ambient Odour Assessment Survey (AOAS) in regard to complaints of environmental odour nuisance. All NABL employees and contractors are to follow corrective actions stated in this survey procedure at all times when conducting an internal as well as external environmental odour assessments.

3. Definitions

RPA- Rapid Plant Assessment
NTEPA- Northern Territory Environmental Protection Authority
NABL- Northern Australian Beef Limited
AOMS- Ambient Odour Monitoring Survey

4. Background

In response to community complaints relating to odour; NABL has created a standard ambient odour monitoring procedure in order to conduct internal and external investigations following receipt of odour complaints.

Standard survey procedures in this document will be implemented during all internal and external investigations following odour complaints and findings will be reported to NT EPA.

| | | | |
|--------------------------------------|-------------------|---------------------------|--------------|
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| | DRAFT | |
| | Subject: | Complaints Handling Procedure |
| | Document No: | |

7. Methodology

| Methods | Complaints handling procedure | Responsible person |
|---|---|---|
| <p>complaints can be made;</p> <ul style="list-style-type: none"> Through community complaints form, which can be accessed from the NABL website or by contacting environmental@aacco.com.au Through the 24 hour contact 0428096952 | <p>Information required to be gathered from the complainant regarding the complaint as listed on the community complaint form- Appendix 1</p> | <p>Steve Rutter Glenn Bulloch David Sneddon</p> |
| <p>Conduct an AOAS in regards to complaints of environmental odour nuisance. During day light hours – immediately During afterhours - By emergency environmental contact on 0428096952</p> | <p>Refer to Ambient Odour Monitoring Survey methods- Appendix 2</p> | <p>Yeresha Herath</p> |
| <p>Report findings of the survey within 24 hours to NABL management and NT EPA</p> | <p>Report findings of each odour survey in a report form.</p> | <p>Yeresha Herath</p> |
| <p>Record all complaints in the NABL complaints register (NABL drive-compliance-quality assurance-documentation-environmental-registers-NABL complaints register-complaints register)</p> | <p>Keep records of all complaints in the NABL complaints register as per condition 14 of the EPL 131</p> | <p>Yeresha Herath</p> |
| <p>Conduct an Ambient Odour Assessment Survey if required</p> | <p>Refer – Ambient Odour Assessment Procedure</p> | <p>Yeresha Herath</p> |

| | | |
|---|----------------------------------|-------------------------------|
|  | Northern Australian Beef Limited | |
| | DRAFT | |
| | Subject: | Complaints Handling Procedure |
| | Document No: | |

8. Monitoring;

All complaints will be recorded in the NABL complaints register for further investigations

During the Ambient odour assessment survey any identified odour sources will be improved immediately by improving operations to minimize or mitigate the odour production.

9. Corrective Action

During a significant community complaints event conduct an Ambient Odour Assessment Survey as soon as practicable.

Complete an ambient odour assessment report following the survey

Notify the NT EPA of the findings and mitigation measures NABL will take to minimise or to mitigate the odour production as per standard non-compliance reporting.

10. Records

Complaints register
Odour monitoring reports

11. Verification

Annual return of the complaints register.

A.1 Community Complaint Form (Appendix 1)

| COMMUNITY COMPLAINT FORM | | <div style="border: 2px solid black; padding: 5px; display: inline-block;"> 0800 LIVINGSTONE BEEF </div> <small>NORTHERN AUSTRALIAN BEEF LTD</small> |
|---|--|--|
| Complainant Contact Details | | |
| Title (Mr, Mrs, Miss) | <input style="width: 95%;" type="text"/> | Family Name <input style="width: 95%;" type="text"/> Given Names <input style="width: 95%;" type="text"/> |
| Street Address | <input style="width: 98%;" type="text"/> | |
| Suburb | <input style="width: 95%;" type="text"/> | Postcode: <input style="width: 95%;" type="text"/> |
| Phone number(s) | <input style="width: 98%;" type="text"/> | |
| Email Address | <input style="width: 98%;" type="text"/> | |
| Details of the Complaint | | |
| Date of the Incident Occurrence | <input style="width: 95%;" type="text"/> | |
| Time of Day | <input style="width: 95%;" type="text"/> | |
| Nature of the complaint | <div style="border: 1px solid black; padding: 5px; float: right; width: 150px;"> Intensity ranking scale 1-very weak 2- weak 3- distinct (moderate) 4- strong 5-very strong </div> (please specify and rank the nuisance using the intensity ranking scale provided) | |
| Odour (please specify) | <input style="width: 95%;" type="text"/> | |
| Noise (please specify) | <input style="width: 95%;" type="text"/> | |
| Other (please specify) | <input style="width: 95%;" type="text"/> | |
| Where were you at the time the nuisance was detected? Time you detected the nuisance? Please provide additional details of the complaint How did this nuisance affect your personal/social life? | | |
| Please submit the completed form to environmental@aaco.com.au or post to PO Box 3072 Palmerston NT 0830 | | |

COMMUNITY COMPLAINT FORM - OFFICE USE ONLY

Complaint Received By

Date Received

Prevailing Weather Conditions

Temperature (°C)

Windspeed (km/hr)

Wind Direction

Humidity (%)

Rain (mm)

Action taken or required


Date action was completed

Responsible manager

Name

Signature

A.2 Ambient Odour Assessment Survey (Appendix 2)

| | | | |
|---|---|---------------------------------|--|
|  | Northern Australian Beef Limited | | |
| | | | |
| Subject: | | Ambient Odour Assessment Survey | |
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1. Purpose

Odour emissions from the NABL facility have generated allegations of environmental nuisance by members of the local community. As a result, an Ambient Odour Assessment Survey (AOAS) management plan has been developed to provide a robust and consistent survey procedure when:

- Responding to allegations of odour nuisance;
- Documenting the findings; and
- Reporting the findings to the appropriate authorities.

This survey procedure will offer transparency in the investigation of complaints and provide confidence to all stakeholders that the information gathered should withstand legal scrutiny. Furthermore, the information gathered may provide a basis by which corrective actions within the NABL facility can be derived.

2. Scope

NABL will implement the Ambient Odour Assessment Survey (AOAS) in regard to complaints of environmental odour nuisance. All NABL employees and contractors are to follow corrective actions stated in this survey procedure at all times when conducting an internal as well as external environmental odour assessments.

3. Definitions


RPA- Rapid Plant Assessment
 NTEPA- Northern Territory Environmental Protection Authority
 NABL- Northern Australian Beef Limited
 AOMS- Ambient Odour Monitoring Survey

4. Background

In response to community complaints relating to odour; NABL has created a standard ambient odour monitoring procedure in order to conduct internal and external investigations following receipt of odour complaints.

Standard survey procedures in this document will be implemented during all internal and external investigations following odour complaints and findings will be reported to NTEPA.

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5. References

The following documents and forms are referenced in the Survey

- Environmental complaints register.
- Rapid Plant Assessment Form
- Field Data Sheet Form
- Environmental Incident Report Form
- Non-Compliance and Trigger Value Exceedence Notification Form
- Odour Management Plan

6. Responsibilities

All Staff

- Any Livingstone Beef staff member who receives and/or responds to a complaint is responsible for ensuring details are passed on to the facility Environmental Officer and follow-up as required.

Plant Manager

- Supply and maintain resources (material/labour) to ensure this procedure is implemented correctly
- Gain information required according to the complaints handling procedure from the complainant to conduct the internal and external odour investigation.

Environmental Officer


- Ensure the investigation is carried out in accordance to the corrective action stated in this procedure.
- Notify the management and NT EPA of findings following the investigation.

7. Procedure Methodology

There are two procedures when conducting an ambient odour assessment system based on the time of day. This approach has been taken for safety reasons.

Complaints can be received directly (complainant contacting the facility directly from the dedicated 24 hour contact number provided) or via EPA hotline. When responding to a complainant ensures to gather all crucial information required to conduct the ambient odour survey (See Section 8).

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The Table below provides an outline of the steps to be taken once an odour complaint has been received.


| Step | Personnel | Step Requirements | Information Required | Daylight Hours | Outside Daylight Hours | Response Timing |
|------|--|---|--|-------------------------------------|--------------------------------|--|
| 1 | Emergency Contact Person / Plant Manager | Gather all required information from the complainant in accordance to the complaints handling procedure. | Community Complaint Form | Emergency Contact Person | Plant Manager | During the discussion with the complainant |
| 2 | Emergency Contact Person / Plant Manager | Pass all information to the Environmental Officer | As much information as possible. Name, address, type of odour, duration, source, intensity | Emergency Contact Person | Plant Manager | Immediately after receiving the complaint |
| 3 | Environmental Officer | Ensure an RPA has been completed by a trained NABL employee. | Rapid Plant Assessment Form in Appendix B | Trained NABL employee | At least two trained employees | Immediately after receiving the complaint |
| 4 | Environmental Officer | Ensure an external odour investigation is completed in accordance with this AOMP (odour assessment should be conducted at least 100 m from and after the complainant's location). | Field Data Sheet Form in Appendix C | Env. officer/ trained NABL employee | At least two trained employees | Immediately after receiving the complaint |
| 5 | Chief Engineer | Ensure suitable mitigation measures in accordance with the Odour Management Plan. | Refer to the Odour Management Plan | Chief Engineer | Chief Engineer | Immediately after receiving the complaint |
| 6 | Environmental Officer | Step 4 – Complete an Environmental Incident Report Form as per AACo <i>Environmental Incident Classification and Reporting Procedure 2015</i> and email NABL management | Environmental Incident Report Form in Appendix D and update the Environmental Incident Register | Env. Officer | Env. Officer | After completing the investigation within 24 hours |
| 7 | Environmental Officer | Submit forms to NABL Management via Environmental@aacom.com.au | Forms to be submitted Appendix A, B, C and any evidence | Env. Officer | Env. Officer | After completing the investigation within 24 hours |
| 8 | Environmental | Complete a Non-Compliance and | Appendix E- Non- | Env. Officer | Env. Officer | After completing the |

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8. Ambient Monitoring Requirements

An Environmental Officer will conduct an odour investigation at the plant boundary (internal) as well as RPA at least twice a week. Additional RPA will be carried during the following circumstances:

- During odour critical maintenance activities when the risk of odour emissions are more likely to occur;
- During unfavourable weather conditions, which have been identified as the hours prior to sunrise and post sunset when stable atmospheric conditions are more likely. During these conditions the wind speeds are low and cloud cover is minimal.

Field Assessment


The following information should to be collected and recorded in the Field Data Sheet.

- Time, date and location
- The prevailing wind direction and wind speed at the time (determined by hand held anemometer).
- Locate the exact wind direction using a hand held compass.
- Determine if there is a detectable odour is in the air, if yes
- Determine if the odour is recognisable
- Determine a rating number for the odour based on surveyor's senses
- Record the frequency of odour detected at the site over X number of minutes
- Observer's signature at the time of completion of the sheet.
- On the appropriately scaled map identify the complaint location / area and its distance and compass direction from the NABL site
- Obtain the wind direction and speed from the latest weather records from the meteorological station.
- Map the wind direction as per weather records at the time of the complaint on the map.
- Once the surveyor gets to the complaint location/area, fill out the field survey sheet 100m from the point and at the point and 100m past the point in order to get a normal distribution.

Rapid Plant Assessment

Rapid plant assessment required to be conducted immediately by a different person to the one who is conducting the external ambient odour assessment.

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9. Corrective Actions

Plant manager

Ensure to gather all required information from the complainant and advise environmental officer of the complaint.

Environmental Officer:

- Ensure that all corrective actions are implemented following the odour complaint such as;
 - Ensure that the RPA is being conducted by a trained NABL employee
 - Ensure the external investigation conducted in accordance to the AOMS methods
 - Submit the ambient odour investigation report to the NABL management via Environmental@aacco.com.au
 - Ensure that the mitigation measures being implemented to reduce or mitigate the odour emission
 - Submit the investigation report to the NT EPA via waste@nt.gov.au

10. Community Communication

Community communication is to be carried out in accordance with the Consultation and Community Plan.

11. Records


- Environmental complaints register
- Environment ambient odour survey reports
- RPA
- Field data sheets


12. Verification

- Regular internal monitoring around the facility
- Regular RPA following the boundary monitoring

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Map – Identify Assessment Locations.

NR MAPS

Street Numbers within Property Boundary Buffers at 250 m, 500 m and 1,000 m Distance




Environmental Nuisance Determination

Key:
 Green – No nuisance
 Orange – Nuisance where an opinion could be formed
 Red – Nuisance where environmental nuisance could be supported

| | | | | | | | | | | | | | | | | | | | | | |
|-------------------|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|----|
| Average Intensity | Number of Odour Events per Minute (1 Detection = 2.5% of the Sampling Period or 3 Seconds) | | | | | | | | | | | | | | | | | | | | |
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| | 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| | 2 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 |
| | 3 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 | 39 | 42 | 45 | 48 | 51 | 54 | 57 | 60 |
| | 4 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 52 | 56 | 60 | 64 | 68 | 72 | 76 | 80 |
| 5 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | |

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Appendix C – Environmental Incident Report Form

This form can be found in the 'AACo Environmental Incident Classification and Reporting Procedure 2015'

| Environmental Incident Report Form | |
|--|--|
| <small>Complete all fields prior to submitting form to management</small> | |
| Name of Person Reporting Incident: | |
| Company: | AACo |
| Date of Incident: | 15/05/2015 |
| Time of Incident: | 12PM |
| Duration of Incident: | Approximately 6 hours |
| Description of Incident: | There was a blockage in the bottom of the punch line; this caused several blockages throughout the line. Some untreated waste water was leaked into the stormwater drain adjacent to the stock yard and the DAF. |
| | |
| | |
| | |
| | |
| Extent of Area Affected by Incident: | Between the cattle yard and the DAF |
| Cause of Incident: | Blockage in the punch line |
| Quantity or Volume of any Pollutants Involved: | Unknown |
| Nature of the Threat to the Environment: leakage of untreated waste water from the punch line into the stormwater drain | |
| | |
| | |
| | |
| Actions Taken to Rectify the Incident: fixing of all blockages within the punch line immediately and moving the fan press up the line to avoid future blockages. | |
| | |
| | |
| | |
| Was the Incident Reported to Authorities: | <input type="checkbox"/> Yes <input type="checkbox"/> No X |
| Name of Authority: | |
| Date/Time Reported to Authorities: | |
| Method of Reporting to Authorities: | |
| Reporting Staff Member | Responsible Manager |
| Print Name: | Print Name: |
| | |
| Signature: | Signature: |
| | |


Doc Title: Environmental Incident Classification and Reporting Procedure

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Appendix D – Non-Compliance and Trigger Value Exceedence Notification Form

This form can be found in the Operational Environmental Management Plan.

|  | ENVIRONMENTAL PROTECTION LICENCE 131 | | | | | | | | | | | | | | | | | | | | | |
|--|--|----------------------|----------------------------------|--|---|--|----------------|--|-------------------|---|--|--|--|---|--|--|--|------------------------------------|--|---------------------|--|--|
| | Non-compliance Notification | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>Information required</th> <th>Information</th> </tr> </thead> <tbody> <tr> <td>Date of the <i>non-compliance</i> detected</td> <td></td> </tr> <tr> <td>Time of the <i>non-compliance</i> detected</td> <td></td> </tr> <tr> <td>Detected by</td> <td></td> </tr> <tr> <td>Actual and potential causes and contributing factors of the <i>non-compliance</i></td> <td></td> </tr> <tr> <td>The risk of <i>environmental harm</i> arising from the <i>non-compliance</i></td> <td></td> </tr> <tr> <td>Action(s) that have or will be undertaken to mitigate any environmental harm arising from the <i>non-compliance</i></td> <td></td> </tr> <tr> <td>Corrective action(s) that have or will be undertaken to ensure that <i>non-compliance</i> does not reoccur</td> <td></td> </tr> <tr> <td>If no action was taken reasons why</td> <td></td> </tr> <tr> <td>Additional comments</td> <td></td> </tr> </tbody> </table> | Information required | Information | Date of the <i>non-compliance</i> detected | | Time of the <i>non-compliance</i> detected | | Detected by | | Actual and potential causes and contributing factors of the <i>non-compliance</i> | | The risk of <i>environmental harm</i> arising from the <i>non-compliance</i> | | Action(s) that have or will be undertaken to mitigate any environmental harm arising from the <i>non-compliance</i> | | Corrective action(s) that have or will be undertaken to ensure that <i>non-compliance</i> does not reoccur | | If no action was taken reasons why | | Additional comments | | |
| Information required | Information | | | | | | | | | | | | | | | | | | | | | |
| Date of the <i>non-compliance</i> detected | | | | | | | | | | | | | | | | | | | | | | |
| Time of the <i>non-compliance</i> detected | | | | | | | | | | | | | | | | | | | | | | |
| Detected by | | | | | | | | | | | | | | | | | | | | | | |
| Actual and potential causes and contributing factors of the <i>non-compliance</i> | | | | | | | | | | | | | | | | | | | | | | |
| The risk of <i>environmental harm</i> arising from the <i>non-compliance</i> | | | | | | | | | | | | | | | | | | | | | | |
| Action(s) that have or will be undertaken to mitigate any environmental harm arising from the <i>non-compliance</i> | | | | | | | | | | | | | | | | | | | | | | |
| Corrective action(s) that have or will be undertaken to ensure that <i>non-compliance</i> does not reoccur | | | | | | | | | | | | | | | | | | | | | | |
| If no action was taken reasons why | | | | | | | | | | | | | | | | | | | | | | |
| Additional comments | | | | | | | | | | | | | | | | | | | | | | |
| <p><i>This document contains information required in accordance with EPL Condition 58</i></p> | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <tr> <td>Northern Australian Beef Limited</td> <td>Version No:</td> <td>2</td> <td>Page 1 of 1</td> </tr> <tr> <td>Authorized By:</td> <td>Compliance/General Manager Innovation and Technology</td> <td>Date of Revision:</td> <td>25th of October 2015</td> </tr> </table> | | | Northern Australian Beef Limited | Version No: | 2 | Page 1 of 1 | Authorized By: | Compliance/General Manager Innovation and Technology | Date of Revision: | 25 th of October 2015 | | | | | | | | | | | | |
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Appendix B EMERGENCY RESPONSE PROCEDURE

| | | |
|---|----------------------------------|--|
|  | Northern Australian Beef Limited | |
| | | |
| | Subject: | Environmental Emergency Response Procedure |
| | Document No: | EVN-EPL-OEMP-ERP-0022015 |

1. Purpose

The purpose of this environmental Emergency Response Procedure is to specify organizational responsibilities, actions and reporting requirements to ensure an effective, consistent and timely management of Environmental incidents that may occur on the Northern Beef Processing Facility and to specify protocols used to deal with environmental incidents affecting or on the site.

2. Scope

This procedure relates to staff and external contractors responsible for the controlling, recording, reporting and investigation of any environmental incident that may affect or occur on Northern Beef Processing Facility.

3. Definitions

OEMP: Operational Environmental Management Plan

LPL 131: Environmental Protection Licence

AACo: Australian Agricultural Company

4. Background

According to the EPL 131 Northern Beef Processing Facility required to develop and maintain an Environmental Incident Response Procedure.


This Environmental Incident Response Procedure will allow staff and external contractors to act efficiently and accordingly in an Environmental related emergency to prevent further harm to the environment as well as to human health.

The Environmental Incident Response Procedure fulfils a requirement in EPL 131. It is also an important component of the OEMP.

5. References

- LPL131 (Appendix 1)
- Environmental Incident: Classification and Reporting Procedure 2015 (Appendix 2)
- Sulfuric Acid spill response guide (Appendix 3)
- Caustic soda spill response guide (Appendix 4)
- Non-corrosive chemicals spill response guide (Appendix 5)

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6. Responsibility

General Manager:

- Supply and maintain resources to ensure this procedure is implemented correctly

Environmental Officer

- Ensure that an updated copy of this Environmental Emergency Response Procedure maintain at the site and in the office readily available for its implementation when required
- Make Environmental Response Procedure part of the tool box talk

Site supervisor

- If an environmental incident occurs in the course of an activity, ensure that the person carrying out the activity immediately implement the mitigation measures in this procedure


HR Business partner

- Include the Environmental Incident Response Procedure in the Induction

7. Methodology


| Environmental Incident Response plan | Persons responsible | Timing |
|--|------------------------------------|-------------|
| Attend to the incident immediately | First responder | Immediately |
| Stop the incident at its source if it is safe to do so. If necessary, cease work in the relevant area and take immediate action to prevent adverse impact to the human health or the environment | Site supervisor First responder | Immediately |
| Contact management immediately on Glenn Bulloch:042 870 9 508 David Sneddon:0439 286 434 Yeresha Herath:0406 926 350 DefendFire on 0889472437 if the incident involves flammable substances. | Site supervisor/ first responder | As required |

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| <p>Implement corresponding mitigation measures as stated in the Spill Response Procedure below in response to the type of incident to avoid environmental/self harm and to rehabilitate the environment.</p> <p>For further information on chemicals involved, refer to respectable MSDS documents on site.</p> <p>To classify the environmental disturbance refer to the Environmental Incident Classification and Identification procedure 2015 (Appendix 2).</p> | <p>site personnel under the supervisors supervision</p> | <p>As required</p> |
| <p>Ensure that emergency vehicles can access the site if required.</p> | <p>Site supervisor</p> | <p>As required</p> |
| <p>Record the incident on the Environmental Incident Register</p> <p>Inform the NT EPA of the incident as per conditions 57 and 58 (and 51 (if required)) of the FPI 131.</p> | <p>Environmental Officer</p> | <p><u>within 24</u> hours of first becoming aware of the non-compliance by emailing waste@rt.cov.au</p> |


| Spill response procedure | Person responsible | Timing |
|---|---|--------------------|
| <p>In a case of a major spill;</p> <p>Isolate the contaminated area</p> | <p>The first responder</p> | <p>Immediately</p> |
| <p>Contact management immediately on;</p> | <p>Site supervisor/ first responder</p> | <p>As required</p> |

| | | |
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| | | |
|---|---|--------------------|
| <p>Glenn Bulloch:042 870 9 508 David Sneddon:0439 286 434 Yerasha Herath:0406 926 350</p> <p>Defend Fire on 0889472437 if the incident involves flammable substances.</p> | | |
| <p>Prior to attending the contaminated area ensure all of the following conditions are fully met:</p> <ul style="list-style-type: none"> • Equipped in appropriate PPE gear provided. • Compatible spill response materials are readily available in sufficient quantities • Cleaning up the spill is safe <p>If any of these conditions are not met, do not attempt to clean up the spill. Stay in a safe area and wait for specialised responders to attend the spill.</p> | <p>Responder/ authorized person attending the contaminated area</p> <p>Specialised responders:</p> <p>Glenn Bulloch:042 870 9 508 David Sneddon:0439 286 434 Yerasha Herath:0406 926 350</p> | <p>As required</p> |
| <p>Attend the contaminated area and take all necessary steps as required on below clean-up procedures.</p> <p>Spill clean up procedures for main hazardous chemicals and other non-hazardous chemicals handled on site</p> <ul style="list-style-type: none"> • Sulfuric Acid (Appendix 3) | <p>Responder/ authorized person attending the contaminated area</p> | <p>As required</p> |

| | | | |
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| <ul style="list-style-type: none"> Caustic soda (Appendix 4) Non corrosive chemicals and solid material (Appendix 5) | | |
| Complete an environmental incident report | Responder | Within 12 hours of responding to the incident. |

8. Monitoring

The Environmental officer will conduct daily and weekly inspections on site. Inspection forms will be uploaded to computer/NABL/Compliance/Quality Assurance/Documentation/Environment/Database/EPL data.

10. Corrective Action

Site supervisor:

- Determine if the incident is considered to be an environmental emergency or an environmental incident according to the AA Co's Environmental Incident Classification and Reporting Procedure 2015.

Site personnel at the time of the incident:

- Complete and submit an Environmental Incident Report to management

Environmental Officer:


- Report the incident using incident reporting format according to the EPL131 by Emailing waste@nt.gov.au within 24 hours of AA Co first becoming aware of the incident.

11. Records

Environmental Officer:

- Record all incidents in the Environmental Incident Register with the details recorded in the Environmental Incident Report
- Collect and file all the Environmental Incident Reports from site personnel

| | | | |
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12. Verification


Tool box talk

Regular site monitoring

Appendix 1 – Environmental Protection Licence EPL 131

See separate file for EPL 131


| | | | | |
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Appendix 2 – Environmental Incident Classification and Reporting Procedure 2015

See separate file for Environmental Classification and Reporting Procedure.

| | | | | |
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Appendix 3 – Sulphidic Acid Spill Response Guide

SPILL RESPONSE GUIDE - SULPHURIC ACID 98% SOLUTION.

HAZARDOUS SUBSTANCE/ DANGEROUS GOODS STATUS.

Sulphuric acid is classified as hazardous in the NOHSC of Designated Hazardous Substances 'NOHSC:1005:1999' and (98% solution) classified as a dangerous good in the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code), 6th Edition, (FORS, 1998).

PERSONAL PROTECTION EQUIPMENT PROVIDED

- Splash goggles
- Full face shield with cartridge respirator with acid fume cartridges (e.g. 3M 'E/P' type cartridge)
- boots
- The clean-up suite (impervious gloves, pants and coat (e.g. Tyvek disposable overalls))
- impervious head wear


HAZARDOUS WASTE HANDLING MATERIAL

- absorbent material (sand bags, pads, spill pillows). Most soil pillows and pads provide in spill kits (usually white in colour) are made to absorb hydrocarbons and are hydrophobic's. As NaOH is aqueous, these pillows will float on the spill and not contain it. Need to make sure the correct spill absorbent material is provided.
- brush with a long handle
- suitable weak base (sodium carbonate or calcium carbonate)
- pH papers
- shovel (plastic)
- water

CLEAN UP METHODS


- Isolate the contaminated area
- Turn off any equipment operating in the contaminated area.
- Wear all appropriate PPE gear prior to entering the contaminated area and avoid breathing in vapours.

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- As quickly as possible band the contaminated area using sand bags, soil pillows, pads or any absorbent material provided to prevent liquid from leaching further.
- Add additional absorbent to absorb as much free liquid as possible.
- Collect all contaminated absorbent, carefully place and seal in plastic bags, double bag the material and put into listed waste bin.
- Use a weak base (such as sodium carbonate or calcium carbonate) to neutralise the acid.
- Use the neutraliser slowly to avoid any splattering by working from edge of spill inwards.
- Mix the neutraliser with a brush (with a long handle) to ensure that the contaminated area is neutralised.
- Test the pH of the contaminated area to determine the level of neutralisation.
- When pH is 6-8 it is no longer considered hazardous waste, therefore the neutralised material can be carefully washed down or scraped off and disposed in designated listed waste material bins to be disposed of at the land fill.
- Be mindful when handling items used to absorb the acid as these items remain as corrosive and should be handled with extreme care by avoiding direct contact with the skin and dispose into designated waste listed waste disposal bins.
- After the area has been fully cleaned, spray the area lightly with water and test with pH paper to ensure there is no further contamination.
- Thoroughly ventilate the area after clean-up.
- Clean the equipment and PPE gear with water and detergent after spill clean up has been complete.

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Appendix 4 – Caustic Soda Spill Response Guide

SPILL RESPONSE GUIDE - CAUSTIC SODA

HAZARDOUS SUBSTANCE/ DANGEROUS GOODS STATUS.

Caustic soda (sodium hydroxide) is classified as a hazardous substance under the ASCC (NO-HS11005 (2007)), also classified as a dangerous goods under the Australian Dangerous Goods Code (ADG Code)

PERSONAL PROTECTION EQUIPMENT PROVIDED

- Splash goggles
- full face shield with cartridge respirator with caustic fume cartridges (e.g. 3M "P" Type cartridges)
- boots
- the clean up suite (impervious gloves, pants and coat (e.g. Tyvek disposable overalls))
- impervious head wear


HAZARDOUS WASTE HANDLING MATERIAL

- absorbent material (sand bags, pads, spill pillows). Mossesol pillows and pads provide in spill kits (usually white in colour) are made to absorb hydrocarbons and are hydrophobic's. As NaOH is aqueous, these pillows will float on the spill and not contain it. Need to make sure the correct spill absorbent material is provided.
- brush with a long handle
- suitable weak base (dilute acetic acid solution)
- pH papers
- shovel (plastic)
- water

CLEAN UP METHODS


- Isolate the contaminated area
- Turn off any equipment operating in the contaminated area.
- Wear all appropriate PPE gear prior to entering the contaminated area and avoid breathing in vapours.

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- As quickly as possible band the contaminated area using sand bags, soil pillows, pads or any absorbent material provided to prevent liquid from leaching further.
- The spill needs to be firstly absorbed using sand or 'kitty litter' type absorbent (something un-reactive is safest) and then use a dilute acetic acid sprayed over surfaces to neutralise the residue and wash the area down once neutral.
- The contaminated absorbent is a hazardous waste that should be double bagged and disposed to an EPA licensed waste facility.
- Test the pH of the contaminated area to determine the level of neutralisation
- When pH is 5 & it is no longer consider hazardous waste; therefore the neutralised material can be carefully washed down (delivered to the DM for scrapped off and disposed in designated listed waste material bins to be disposed of at the land fill.
- Be mindful when handling items used to absorb the acid as these items remain as corrosive and should be handled with extreme care by avoiding direct contact with the skin and dispose into designated listed waste disposal bins.
- After the area has been fully cleaned, spray the area lightly with water and test with pH paper to ensure there is no further contamination
- Thoroughly ventilate the area after clean-up.
- Clean the equipment and PPE gear with water and detergent after spill clean-up has been complete.

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Appendix 5 – Non-corrosive Chemicals

SPILL RESPONSE GUIDE - NON-CORROSIVE CHEMICALS/ SOLID MATERIAL

HAZARDOUS SUBSTANCE/ DANGEROUS GOODS STATUS.

N/A

PERSONAL PROTECTION EQUIPMENT PROVIDED

- Splash goggles
- Cartridge respirator with suitable cartridge (e.g. 3M "A/P" Type cartridges for petroleum products)
- boots
- the clean up suite (impervious gloves, pants and coat)
- impervious head wear (optional)


HAZARDOUS WASTE HANDLING MATERIAL

- absorbent material (sand bags, pads, spill pillows)
- brush with a long handle
- pH papers
- shovels (plastic)
- water

CLEAN UP METHODS

- Isolate the contaminated area
- Turn off any equipment operating in the contaminated area.
- Wear all appropriate PPE gear prior to entering the contaminated area and avoid breathing in vapours.
- As quickly as possible bund the contaminated area using sand bags, spill pillows, pads or any absorbent material provided to prevent liquid from leaching further.
- Add extra absorbent to absorb as much of the spill material as possible.
- Use the shovel to pick up all solids and dispose them in the listed waste bins to be transported to an EPA licensed waste facility.
- If the spill was in a bunded area use water and detergent to wash down the contaminated area (divert the wash down water to the DAF).

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- If the spill was on soil scrape the top contaminated layer and dispose contaminated material in a designated listed waste bin.
- Thoroughly ventilate the area after clean-up.
- Clean the equipment and PPE gear with water and detergent after spill clean-up has been complete.

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Appendix C STANDARD OPERATING PROCEDURES

The combined standard operating procedures will be submitted separately due to the size of the document.