Sarval Nottingham
Odour Management Plan
Reviewed July 2024

Revision Number	Revision Authorised by	Date Submitted to the Environment Agency	Revision Owner
Rev001	Site Manager	March 2016	Kristyan White
Rev002	Site Manager	September 2023	Ryan Websell
Rev003	Site Manager	July 2024	Joseph Barnes

* Environment Agency to govern site from 2024

Site Details

Site Name – Sarval Nottingham

Site Address – Sarval Nottingham, Stoke Lane, Stoke Bardolph, Nottingham, NG14 5HJ

Operator Name – Sarval Limited

Permit Number – TBC (When A(1) is granted)

This document provides the Odour Management Plan for the site, covering all aspects of the operation including but not limited to the following:

- Receipt of Raw Materials
- Operation of the Processes
- Handling & Treatment of Odorous Emissions
- Product Dispatches
- Handling of Incoming Complaints
- Abnormal Circumstances

This plan is for use by the site management team, including site team leaders and has been made available to the Environment Agency* who regulate the site from the Environmental perspective.

Site Management will review this document annually or upon major change in the sites production processes and provide training to the sites team leaders on its use.

Contents

Introduction

The purpose of this Odour Management Plan (OMP) is to demonstrate that the processes and activities on site which have the potential to generate odours are controlled and managed effectively so as not to cause pollution or annoyance beyond the boundary.

It describes how odour is controlled and managed under normal operation and also what additional measures are taken in abnormal or emergency situations. It has been written in line with the current H4 (version 2) Odour Management guidance, the sector specific SG8 Guidance for Rendering and the Environment Agency Sector Performance Review of Slaughterhouses and Animal By-Product Industries 2010.

The rendering of animal by-products generates odours which must be minimised where practical, contained and abated. The OMP considers all aspects associated with the Category 3 rendering process from delivery of raw materials through to dispatch of finished products. It also considers associated activities such as effluent treatment and vehicle washing.

It is important to note that most animal by-products begin to degrade at the point of production (i.e. at the slaughterhouse) and that the degradation process generates odours. In this respect it is important that they are delivered to site as soon as is practical after the point of production to ensure that odour generation is minimised and that they can be processed promptly. This is achieved by liaising with suppliers and hauliers to ensure that the frequency of collection is appropriate. The H4 Guidance makes reference to rejecting odorous materials and whilst this may be an effective control measure for some processes it is not necessarily always the appropriate course of action for animal by-products. Diverting odorous material will only extend and accelerate the degradation process leading to increased odour to wherever it is diverted. However, diversion of material can be undertaken in abnormal situations such as a major breakdown or where it is deemed necessary to reduce operational processing hours.

Responsibilities

This OMP is to be used by the Sarval management and personnel as a working basis for the prevention, minimization and control of odour.

The OMP will be reviewed annually, or if there are significant changes to the site's operations or infrastructure. Additionally, it may be reviewed if significant numbers of complaints are received. It is the responsibility of the Process Development Engineer to ensure this plan is reviewed. Following a review, the relevant persons will be updated on any changes.

This plan will be circulated to the relevant persons involved in the management of this plan.

Site Setting

Sarval operates a rendering facility at the site on Stoke Lane, Nottingham. The facility covers an area of approximately 14253 square metres and its location is identified in Figure 1 below.

Figure 1 – Site Location.

The prevailing wind directions as shown on the wind rose are west and southwest.

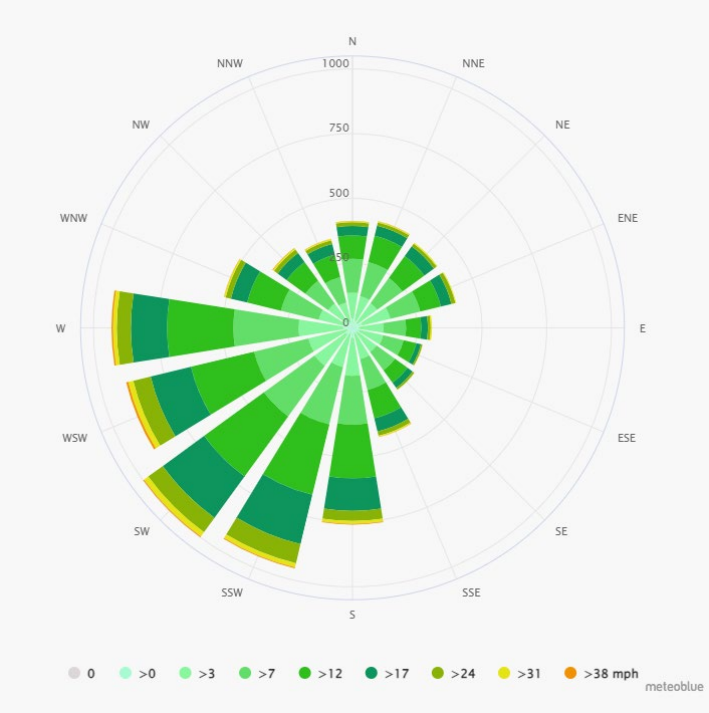

Figure 2 – Weather Rose

Sensitive Receptors

Sensitive receptors are those individuals or groups of individuals which have the potential to be affected by odour emissions from the site. For the purposes of this plan, they are considered to be staff on site, nearby workers, residents and any person or persons within the vicinity of the site. Whilst complaints relating to odour are very low it is still important to acknowledge the potential impact of odour from the site.

For the purposes of this OMP sensitive receptors have been identified. The following table shows nearby sensitive receptors and the distance and direction from the site. These are also shown on figure. 3.

Table 1 – List of Sensitive Receptors

Receptor No. / Name	Approximate Distance from Site (km)	Direction from Site
1. Stoke Lane Cottages	0.4	East
2. Rivendell Estate	1.0	Southwest
3. Netherfield Area	1.5	Southwest
4. Carlton Area	2.3	West
5. Gedling Area	2.5	West
6. Burton Joyce	2.1	Northeast
7. Colwick	2.0	Southwest
8. Gunthorpe	5.5	Northeast
9. Arnold	4.9	Northwest

Figure 3 – Location of Sensitive Receptors.

Weather Data

Sarval utilises its own weather monitoring equipment to provide the most accurate information with regards to weather for the site's specific location. The data is stored online and can be accessed by any member of the site management team and is provided to the Environment Agency local officer. An example of the live weather data is shown below in figure 4.

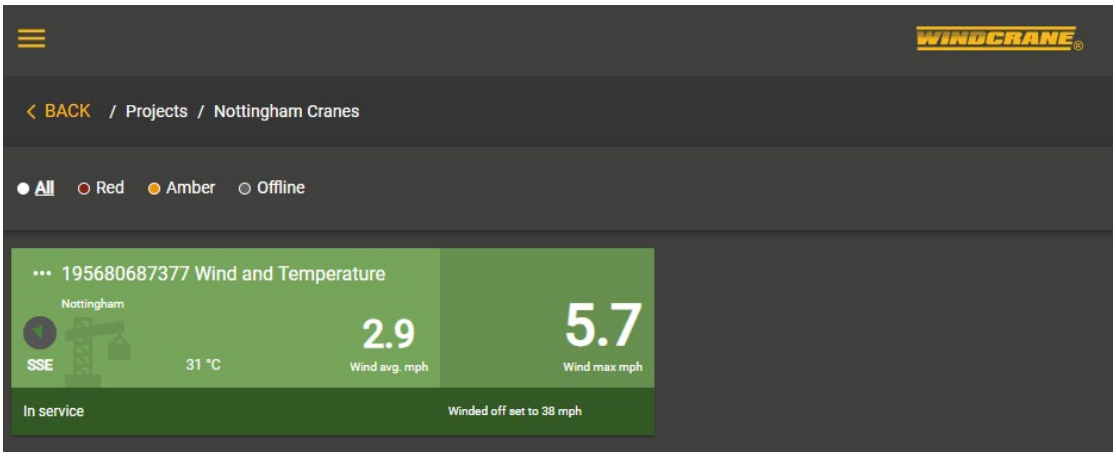

Figure 4 – Live Weather Data Example.

On Site Processes and Activities

The site has two permitted processing activities:

- Category 3 (C3) Rendering Plant (Poultry Processing Plant)
- Category 3 (C3) Feather Processing Plant

Associated Activities and Ancillary Plant:

- Effluent Treatment Plant
- Chemical Scrubbers for Odour Control (No.1, No.2, No.3 Scrubber)
- Boiler Plant (No.1 Boiler, No.2 Boiler and Thermal Oxidiser)
- Raw Material Reception for Poultry & Feather (Poultry Raw Material Reception and Feather Bay)
- Processed Animal Protein (PAP) Storage (Harvestore 1 & 2, Feather Silo 3 & 4, Bag Store)
- Fat Storage Tanks
- Vehicle Washing Facility

The rendering and processing of animal by-products (ABPs) generates odours which must be minimised and where practical, contained and abated.

The OMP considers all aspects associated with the processing of ABP's onsite. It also considers associated ancillary activities such as effluent treatment and vehicle washing.

A site plan showing the location of the different processes and activities is provided in figure 5.

Figure 5 – Site Processes & Activities.

Process Description Overview

The facility is an animal by-products (ABPs) rendering processor, which accepts Category 3 ABPs. Category 3 ABPs arise from material which has previously been passed fit for human consumption. The process involves size reduction, evaporation of water and sterilisation of animal by-products to produce finished products: Poultry Processed Animal Protein (PAP), Poultry Fat and Feather PAP.

Up to 250,000 tonnes of raw materials per year (poultry and feather) are delivered onto site in dedicated vehicles. All vehicles delivering animal by-products to site are fully enclosed, sheeted bulk tipper trailers or skip wagons. ABP deliveries can occur 24 hours per day, seven days a week.

Raw material deliveries arriving at site are checked against a pre-agreed intake schedule before being weighed in using the sites weighbridge facility. The weighbridge operator confirms all of the necessary paperwork is correct before proceeding. The delivery is then directed to the appropriate reception hopper depending on whether it contains poultry or feather raw materials. If a raw material delivery is required to wait to unload, it is kept in the covered trailer. All vehicles and containers are hosed out internally before being fully cleaned in the dedicated trailer wash facility.

Poultry Process

The raw material hoppers (Hopper A & B) each hold circa 150 tonnes of material. The material is screw conveyed into the crusher and reduced down to a particle size of less than 30mm. The crushed material can then be pumped to either of the rotor disc driers (A or B). The driers evaporate the water from the raw material (c. 65-70%) using indirect steam heat. The driers must achieve a specific temperature as set by APHA before the dry material can be discharged for further processing. The evaporated water vapour in condensed in a series of air blast condensers before being pumped to the effluent treatment plant, prior to entering the trade effluent stream. Non-Condensable gases which cannot be condensed are incinerated by the sites steam raising boilers, with a Pre-Acid Scrubber & Carbon Filter as a secondary abatement system for when the boilers are not operating at the required firing rate.

The sterilised product is conveyed from the two driers via metal removal and fine crushing systems into a buffer bin. The buffer bin feeds the four expeller presses which separate the protein (solids) from the fat. The fat is screened and polished via both horizontal and vertical centrifuges with the fine solids captured and returned to earlier in the process. The fat is then transferred to the external storage tanks ready for sale.

The dry product from the poultry process; PAP is cooled to c. 40°C using a rotor disc cooler. This reduces the generation of odour and decreases the risk and fire. Once cooled, the PAP is ground and screened the achieve the products specification. Once adequately sized, the PAP is conveyed to one of the external storage silos. From the silos is can be loaded onto a bulk trailer in the meal loading area or loaded into bulk bags. This is dependent on the individual customer.

Feather Process

The feather raw material is delivered into a feather hopper within the Feather Handling Building. The feather is then conveyed into the continuous steam hydrolyser via metal removal systems. The continuous hydrolyser injects live steam into the vessel to achieve a pressure of c. 5.5 barg. The pressure and temperature within the vessel break down the feather proteins to produce a pulp which can be dried. The conditions within the hydrolyser also satisfy the APHA processing method 7. Once hydrolysed, the pressure is returned to atmospheric conditions via a flash vessel and the material is conveyed into Drier 3C. The vapour from the flash vessel is either condensed using the two air blast condensers or incinerated by the site's recuperative thermal oxidiser. This rotor disc drier uses indirect steam to remove the remaining moisture from the feather material. This drier operates under a vacuum of c. -650 mbar enabling it to operate at lower temperatures, improving the quality of the finished product and using less energy. The vapour from the drier is condensed using a shell & tube condenser with the liquid being pumped to the effluent treatment plant. The non-condensable gases are incinerated by the sites shell boilers/thermal oxidiser with the Pre-Acid Scrubber & Carbon Filter (PASCF) providing secondary abatement.

The dry, sterilised product is conveyed from the drier, via a plucker sieve to remove any contamination into a blow line for transfer to the feather meal cooler. The feather meal is cooled, ground and conveyed to one of two external storage silos prior to being loaded into dedicated trailers or tote bags.

High strength, low volume odours extracted from the process equipment (LEV's) are treated via the pre-incineration scrubber before being incinerated by either the sites shell boilers or recuperative thermal oxidiser. The PASCF provides a standby abatement system.

Room air from all areas of the factory is extracted to one of three chemical scrubbers. Scrubber No.1 draws air from the Poultry Processing Room and receives the treated exhaust from the Carbon Filter. Scrubber No.2 pulls from the two mill rooms, the feather drying area and the central processing room. No.3 scrubber pulls from the raw material reception areas. The scrubbers use a combination of Sulphuric Acid (1st Stage) and Sodium Hypochlorite/Caustic to treat the odorous room air. These scrubbers are continuously monitored for Redox & pH with regular testing and assessment.

The effluent treatment plant consists of a Dissolved Air Floatation (DAF) plant which receives all the wash down waters from the factory (via a collection sump) and removes any fats/oils/solids. This is stored in the sludge tank and disposed of via a third-party contractor. The clean effluent is then discharged to the neighbouring sewage works alongside the condensate from the air condensers.

Inventory of Odorous Materials

Material	Location	Strength / Type / Description of Odour	Variation in Odour	Reception / Storage / Loading / Dispatch Procedures
C3 ABPs (Poultry)	Loaded Vehicles Entering Site. Poultry Raw Material Reception.	Range from low to medium. Rotting flesh. Material delivered under strict time controls from killing stations to minimize degradation.	Potential for variation and higher strength with higher ambient temperature	Delivered in enclosed or covered vehicles. Off-loaded into raw material hoppers, roller doors closed as soon as delivery is complete. Loads may be rejected if not of high enough quality (freshness, colour, odour, foreign body contamination). Loads will be assessed individually if they cannot be delivered in the required window.
C3 ABPs (Feather)	Loaded Vehicles Entering Site. Feather Raw Material Reception.	Range from low to medium. Rotting Feathers, Ammonia, Sulphur. Delivered under strict time controls from killing stations to minimize degradation	Potential for variation and higher strength with higher ambient temperature	Delivered in enclosed or covered vehicles. Off-loaded inside extracted building when roller doors are closed. Loads may be rejected if not of high enough quality (freshness, colour, odour, foreign body contamination)
C3 Poultry PAP	Harvestore 1 and 2. Loaded Vehicles Leaving Site. Poultry Mill Room. Meal Bag Store Building.	Low odour, powder, dry petfood, dog biscuits.	Minimal variation	Stored in silos. Meal is cooled prior to further processing to minimise the odour. Trailers or tankers are loaded inside extracted building with roller doors closed.
C3 Poultry Fat	Fat Storage Tanks. Loaded Tankers Awaiting Dispatch.	Low odour, fatty, cooking.	Minimal variation	Stored in closed tanks. Potential for fugitive emissions during tanker loading. Procedures in place to control time allowed for loading.
C3 Feather PAP	Silos 3 and 4. Feather Mill Room.	Low odour, powder, dry petfood, dog biscuits.	Minimal variation	Stored in silos. Meal is cooled prior to further processing to minimise the odour. Trailers or tankers loaded inside extracted building with roller doors closed
Effluent Condensate	Poultry process plant and Feather process plant, condensers, condensate tank	Medium to high strength, Ammonia, sour	Minimal variation	Process condensate pumped in enclosed pipes and discharged to onsite effluent treatment plant.
Effluent Sludge	ETP Sludge Tank	Low odour, earthy, compost	Minimal variation	Sludge stored in enclosed tank. Potential for fugitive odours during tanker loading, although loading takes place within an enclosed, extracted building.
Effluent Wastewater	ETP DAF Plant.	Low strength odour, earthy, peat, compost	Minimal variation. Potential for increased strength with higher ambient temperatures or reduced treatment	DAF plant is outside so potential for fugitive emissions. Effluent is continuously treated and there is no opportunity for stagnant water to occur.

Odour Characterisation

The odour generated from raw and processed ABPs is usually a complex mixture of chemicals or compounds which can cause an adverse olfactory impact to sensitive receptors.

The typical compounds associated with ABPs are hydrogen sulphide, ammonia, various volatile organic compounds, amines and mercaptans.

It is important to recognize that organic odours are often a very complex mix of numerous different compounds which cannot be easily characterized.

Odour Emissions

For the purposes of this plan odour emissions are classed as:

- Treated odour emissions from the Chemical Scrubbing Towers (typically a chlorine or 'swimming pool' type odour)
- Animal byproducts – the raw materials to be processed within the plant.
- Treated odour emissions from the Boiler and Thermal Oxidiser stacks (typically an exhaust type odour)
- Fugitive emissions from open tanks or vessels
- Fugitive emissions resulting from abnormal situations or incidents

It is also important to note that treated odours from the abatement systems will always have a residual odour. The site must therefore ensure that the abatement systems are operated and maintained in a manner which minimizes the odour impact to an acceptable level.

Odour Classification/Treatment Systems

Odours generated from the processing of animal by-products can be classified into two distinct streams:

- High intensity, low flow odours arising from the evaporation process (non-condensable) and processing equipment (concentrated odours).

  These odour streams are pre-scrubbed in a water scrubber, then incinerated by the shell boilers and/or recuperative thermal oxidiser. A standby pre-acid scrubber and Carbon filter system is available for when the firing rates of the boilers is below the required threshold.

- Lower intensity, high flow odours arising from extracted building air. These odours streams are treated by the three chemical scrubbing towers.

  - No.1 Scrubbing Tower is a single stage scrubber using Sodium Hypochlorite and Sodium Hydroxide. It treats approximately 35,000 m^3/h of air from the poultry process area.

- No.2 Scrubbing Tower is a two-stage scrubber using Sulphuric Acid on the first stage and Sodium Hypochlorite and Sodium Hydroxide solution on the second stage. It treats approximately 70,000 m^3/h of air extracted from the mill rooms, central processing area and the feather drying area.

- No.3 Scrubbing Tower is a two-stage scrubber using Sulphuric Acid on the first stage and Sodium Hypochlorite and Sodium Hydroxide solution on the second stage. It treats approximately 90,000 m^3/h of air extracted from the raw material reception buildings.

Normal conditions

Due to the nature of ABPs, rendering is inherently odorous and odours therefore arise throughout the process.

Process control measures and monitoring are designed to ensure that the process is operated to minimize further odour generation and contain and treat odour which exist and arise.

The C3 plants are validated by APHA and must therefore achieve a minimum drying temperature to ensure sterilization of the ABPs. This temperature is continuously monitored to ensure it is met whilst controlling the process to maintain things such as that the products are not over cooked and energy use is optimized. The application of heat generates odours and these high strength odours are contained and treated by incineration.

Ensuring that the high strength odours are contained is critical to minimize any fugitive odour escaping into the process building. Air within the process buildings is treated by the chemical scrubbing towers and building integrity is regularly assessed.

The operation of the scrubbing towers is continuously monitored for pH and redox potential and regular checks are carried out. Records of these are kept in the site's Environmental files (Environmental PEMS Log). Templates of these can be found in the appendices.

Site Training Programmes are in place for all employees covering environmental responsibilities with particular regard to the prevention and control of odour. Relevant personnel are identified through Training Matrix (needs identification as well as recording frequency).

The tables below describe each area of the process, the normal operating practises and identifies key risks and the control measures in place to minimise these.

Delivery of Raw Materials & Transfer to Raw Material Reception Areas

Normal Operation **Odour Source**	**Risk**	**Controls & Monitoring Measures**	**Documents/ management system controls**
Delivery vehicles containing Raw Material.	Light odour detected local to vehicle	• All vehicles should be enclosed/sheeted on arrival. • Driver vehicle checks • Weighbridge operative checks on arrival. • Raw Material Reception Operator Checks. • Any dolavs/small containers of raw material are stored and unpacked inside the raw material reception building. • Deliveries are pre-booked in via the sites weighbridge system.	HACCP system Raw Material acceptance procedure
Abnormal Events	**Risk**	**Actions Required**	**Documents/ management system controls**
Trailer sheeting damaged, or vehicle damaged.	Loss of containment. Raw material odour detected off site.	• Priority tipping for odorous loads or vehicle parked inside raw reception until able to tip. • If a trailer is unable to be tipped for an excessive amount of time, the EA should be informed via a schedule 5 form.	Vehicle offloading procedure.
Trailers awaiting transit to another Saria site	Raw material odour detected offsite	• Any trailers in transit to another Saria site (reject loads or downgraded material) should be assessed by a member of the management team. If deemed acceptable they should be parked in a suitable location to await collection. If the odour level is deemed excessive, they should be parked inside and removed from site as soon as possible. • Material to be tipped and processed or dispatched from site within 24 hours.	Trailers to be stored either inside the raw material bay if required.

Unloading of Raw Material & Raw Material Reception

Normal Operation **Odour source**	**Risk**	**Controls & Monitoring Measures**	**Documents/ management system controls**
Vehicles offloaded directly into hoppers.	Odour in hoppers. Odour in building during offload.	• High speed doors in front of the hoppers. • Building extraction to Scrubbers • Daily odour tour carried out.	REC02/04 Production Environmental Checks Document Daily Environmental Checks Document
Vehicle cleaned in Reception area building	Potential of odour from effluent production containing ABP.	• Effluent is captured by enclosed drainage system. Transferred to onsite ETP for immediate processing. • Drains kept clear in area to allow flow to ETP.	Daily Environmental Checks Document
Abnormal Events	**Risk**	**Mitigation Measures/ Actions Required**	**Documents/ management system controls**
Tipping raw material trailers on the floor to inspect the material.	Increased odour concentration to scrubber.	• Only suitable material should ever be tipped onto the floor for inspection – this is controlled by acceptance procedures and protocol. • Assess the scrubber performance via sniffer pipe and ensure the free chlorine levels remain sufficient. • Area kept under negative pressure. • Perimeter olfactory assessments are undertaken daily – a certain indicator if loss of extraction has occurred in building. Additional assessments can be carried out if required, up to four times per day. • Carry out repairs as required, if required the process will shutdown for these to take place.	Tipping Procedure Production Environmental Checks Document Daily Environmental Checks Document Olfactory assessments undertaken daily and frequency set through this plan.
Loss of Extraction to Building.	Loss of containment when transferring to hoppers. Low level odour may be detected off site on arrival.		

		• Any potentially offensive offsite odour detected would be reported to the Environment Agency via a Schedule 5 form.	Schedule 5 notification process as part of the site EMS.
Door Failure (Open)	Loss of Containment Low Level Odour	• Perimeter olfactory assessments are undertaken daily • Carry out repairs as required. • Manual operation to close doors whilst repairs are carried out. This area is manned throughout production. • Staff trained in responsibilities to prevent fugitive emission releases (i.e. knowledge how important door control is, to ensure all odour management arrangements are completed). • Report to the Environment Agency via a Schedule 5 form.	Staff training records/Work Instructions/ SOPs

Poultry Processing Building & External Air Condensers

Normal Operation **Odour source**	**Risk**	**Controls & Monitoring Measures**	**Documents/management system controls**
Drying of material. Vapour from dryers condensed to condensate and non-condensable gases. Separation of Solids & Fat. Solid Removal from Fat.	Odour from drying and dried products Loss of containment of odour from process plant	• Locally extracted concentrated odours (CO) extracted to pre-scrubber, boilers/thermal oxidiser or standby Carbon Filter. • Non-Condensable gases incinerated or treated via Carbon Filter. • Building extracted to No.1 scrubber. • Driers kept under negative pressure. • Air Condenser Temperatures continuously monitored. • Drier Discharge Temperature continuously monitored.	Scada monitoring Live trended for 1 year Trends printed weekly and kept for 5 years Environmental Monitoring documents (see appendices).
Abnormal Events	**Risk**	**Actions Required**	**Documents/management system controls**
Drier/air condenser breakdown	Loss of containment of odour from process plant. Increased load to scrubber	• Divert material to an alternative renderer, either a SARIA plant or a competitor if the plant cannot be restarted within reasonable time period. Sarval has a category 3 plant in Hartshill and an arrangement with JG Pears in Newark. • Increase scrubber monitoring and carry out additional sniff testing in area.	Material Diversion Plan.

Failure of part of the CO abatement system	Escape of CO into building Increased load on scrubber	• Standby Carbon Filter to be brought online if Concentrated odours cannot be incinerated via the boilers. • Increase scrubber monitoring and make additional off-site assessments	
Drier operating under positive pressure	Increased odour load on scrubber.	• Regular ppm carried out on air condensers and vapour ducting • Swap to alternative CO treatment system in event of breakdown.	
Fat Spillage	Increased odour load on scrubber.	• Spillage clean-up procedures are in place. • Regular ppm and cleaning are carried out in the area.	HACCP System
Press/Centrifuge Failure	Loss of Containment during maintenance. Increased raw material stock if prolonged breakdown.	• Switch to the standby machines; there are four presses and two centrifuges. • Slow the process down if required. • Store un-centrifuged fat if required.	
Power Failure	Odour Control Systems stop High raw material stocks Equipment full of semi-processed material	• If the power is off for a prolonged period, divert raw material deliveries. • Inform the Environment Agency via a Schedule 5 notification.	

Meal Cooling, Grinding & Screening

Normal Operation **Odour source**	**Risk**	**Controls & Monitoring Measures**	**Documents/management system controls**
Handling of hot and cooled PAP. Grinding of PAP Screening of PAP Dosing of Anti-Oxidant	Odour from PAP (mainly when hot) Fire	Extraction from cooler and hot conveyance to No.2 Scrubber. Building extracted to Scrubber 2 Fire detection fitted - flame sensors, smoke detectors and cameras	HACCP System
Abnormal Events	**Risks**	**Actions Required**	**Documents/management system controls**
Fire	Smoke overloading scrubber	• Shutdown, follow fire procedures • Maintain scrubber extraction unless scrubber integrity threatened	Fire Procedure
Equipment Failure Cooler Failure Blockages	Spillage of hot material	• Spillage clean-up procedures are in place. • Regular ppm and cleaning are carried out in the area. • Extraction Systems regularly cleaned & maintained. • Two Mills & Shaker Screens are available to maintain plant operation.	HACCP System Spillage procedure

Meal Loading & Storage Silos

Normal Operation Odour source	Risk	Controls & Monitoring Measures	Documents/management system controls
Handling and Storage of Cooled MBM	Odour detection outside building	• Meal cooled prior to loading. • Sealed conveyors • Meal loaded inside building. • Building extraction to scrubber 2 • Trailers sheeted before leaving building • Doors to kept closed except for vehicle access/ingress • Loaded trailers dispatched as soon as possible	HACCP System
Abnormal Events	**Risks**	**Actions Required**	**Documents/management system controls**
Ripped sheeting	Loss of containment of odour	• Sheeting to be replaced before leaving building	
Failure of loading equipment	Back-up of PAP	• Use Storage Silos as a buffer • Load Material into Bags	
Failure Silo Cutter	PAP odour release when emptying silos	• Additional offsite boundary checks • Regular ppm on Silo equipment via external contractor	FlexMaint

Fat Storage & Loading

Normal Operation **Odour source**	**Risk**	**Controls & Monitoring Measures**	**Documents/management system controls**
Pumping, Storage and Loading of hot fat	Odour from hot fat Spillage	• Fat tanks lidded • Tanks are fitted with continuous level indicators and alarms. • Tank Feed Pumps automatically shut-off at high level.	Scada System Operational Procedures
Abnormal Events	**Risks**	**Actions Required**	**Documents/management system controls**
Instrument failure	Overflow of tank	• Use manual level check • Divert to another tank, load out tankers	A data capture (SCADA) system is in place to monitor this in real time
Fat Pipework failure or leak	Spillage	• Contain spillage until solid, then collect and recycle to process	HACCP Spillage Procedure

Feather Processing & Vapour Handling

Normal Operation **Odour source**	**Risk**	**Controls & Monitoring Measures**	**Documents/management system controls**
Hydrolysation of Feather Drying of Hydrolysed Feather Vapour Handled by Air Condensers/Recuperative Thermal Oxidiser	Odour from drying/dried product. Odour from hydrolysing/raw feather. Loss of containment of odour from process plant.	• Locally extracted concentrated odours (CO) extracted to pre-scrubber, boilers/thermal oxidiser or standby Carbon Filter. • Non-Condensable gases incinerated or treated via Carbon Filter. • Building extracted to No.3 scrubber. • Driers kept under negative pressure/vacuum. • Air Condenser/Vacuum Condenser Temperatures continuously monitored. • Drier Discharge Temperature continuously monitored. • Hydrolyser Safety Systems in place. • When utilising the Thermal Oxidiser, air condensers are ready as a standby.	HACCP System Environmental monitoring documents (see appendices)
Abnormal Events	**Risks**	**Actions Required**	**Documents/management system controls**
Hydrolyser Blowback	Loss of Containment of Odour. Increased odour load to scrubber.	• Increase scrubber monitoring. • Additional offsite assessments.	

Air Condenser/Thermal Oxidiser Trip.	Process Vapour not evacuated. Increased loading to scrubber.	• Two air condensers available to ensure sufficient capacity/back-up. • Increase scrubber monitoring. • Additional offsite assessments.	Scada controlled – monitoring in real time so any malfunctions of odour abatement are highlighted immediately. HACCP Manual
Hydrolyser Gland Fail	Odour and product loss of containment	• Shut vessel down • Repack gland	FlexMaint Regular weekly maintenance PPM's

Effluent Treatment Plant

Normal Operation **Odour source**	**Risk**	**Controls & Monitoring Measures**	**Documents/management system controls**
Screening of raw material drainage. Treatment of washdown water and other Effluent from the process. Discharge of treated effluent and process condensate to Severn Trent.	Odour from open DAF Plant.	• DAF is operated continuously to ensure water does not become stagnant. • Waste Sludge is stored in a closed tank. • Regular monitoring by site. environmental operative. • Screen located within the feather raw material reception which is extracted to No.3 Scrubber.	The DAF process has many checks in place. It is checked several times throughout the day. Monitored by the Environmental Operative.
Abnormal Events	**Risks**	**Actions Required**	**Documents/management system controls**
Shortage of effluent treatment chemicals	Reduced treatment efficiency possible failure to meet discharge consent. Minimal relevance to odour production.	• Sufficient chemicals are held on stock. • Multiple suppliers are utilised across the company to provide resilience.	Chemical stocks are recorded on the weekly sheet (Week No. …)
Sludge Tank Overflow	Odour/pollution from spillage.	• Sludge tank is within a building so spillage would be contained and directed to drainage system • Sludge removal is planned in advance to avoid storage tank filling up.	

		• Potential to decant into IBC in the unlikely event of removal tank attending site.	
DAF Equipment Failure	Odour from effluent sump Minimal relevance to odour production	• Inform Severn Trent of the failure • Continue to discharge if consent for suspended solids can be maintained. • Carry out repairs as soon as possible. • Regular PPM/inspection carried out by the environmental operative.	

Vehicle Washing

Normal Operation **Odour source**	**Risk**	**Controls & Monitoring Measures**	**Documents/management system controls**
Washing to remove traces of odorous / offensive raw material	Odour from residual raw material	• Vehicles and trailers washed out and disinfected inside raw material reception area prior to full wash • Trailers cannot leave site without receipt of a wash ticket • Vehicles sprayed with de-odoriser prior to leaving site	HACCP System
Abnormal Events	**Risks**	**Actions Required**	**Documents/management system controls**
Loss of water supply	Odour from vehicles	• Retain vehicle on site until supply restored	

Treatment of Extracted Building Air by Chemical Scrubbers

Normal Operation **Odour source**	**Risk**	**Controls & Monitoring Measures**	**Documents/management system controls**
Chemical scrubbing and of air extracted from buildings prior to discharge to atmosphere	Emission of partially treated odour to atmosphere	• Continuous monitoring of scrubber CCPs • Daily checks on scrubbers • Offsite Odour assessments • Drager checks on scrubber exhausts	Scada monitors scrubbers Daily Environmental Checks Document Production Environmental Checks Document Need procedure for offsite assessments
Abnormal Events	**Risks**	**Actions Required**	**Documents/management system controls**
High ambient temperatures	Treatment efficiency reduces causing increased odour in scrubber exhaust	• Increase scrubber monitoring/chemical or water make up. • Offsite Odour assessment	Environmental monitoring documents (see appendices)
Fan failure	Reduced air extraction from factory leading to fugitive emissions Overload of other equipment	• Use offsite odour assessment to determine if plant shutdown necessary • Replace fan with spare as soon as practicable • Reduce production levels to limit extraction requirements	
Water supply failure	Treatment efficiency reduces slowly causing increased odour in scrubber/bio bed exhaust	• Increase scrubber monitoring • Offsite Odour assessment • Switch to back-up water supply (Towns/borehole)	

Dosing pump, probe or controller failure	Treatment efficiency reduces slowly causing increased odour in scrubber exhaust	• Control manually • Increase scrubber monitoring • Offsite Odour assessment	
Circulation pump failure	Treatment efficiency reduces or goes to zero causing increased odour in scrubber exhaust	• Increase scrubber monitoring/chemical or water make up. • Use offsite odour assessment to determine if plant shutdown necessary • Replace pump with spare from the stores as soon as possible. • Shutdown scrubber until the pump is repaired/replaced.	
Loss of building integrity e.g. door failure	Fugitive release of odour	• Temporary building repair / sheeting • Manual operation to close doors whilst repairs are carried out • Staff trained in responsibilities to prevent fugitive emission releases	
Run out of chemicals	Loss of treatment in scrubbers	• Daily stock checks • Order of chemicals well in advance of needs • Group purchasing with common supplier • Group common chemicals for transfer between sites	Daily Environmental Checks Document Chemical stocks recorded in Weekly document
Scrubber internal damage	Loss of treatment efficiency	• Regular scrubber internal inspections	

Treatment of Concentrated Odours

Normal Operation **Odour source**	**Risk**	**Controls & Monitoring Measures**	**Documents/management system controls**
Extraction and Incineration of concentrated odours and Non-Condensable Gases	Inadequate incineration of CO allowing emissions to air from boilers Failure to contain CO in LEV and incineration systems causing scrubber increased load	Primary incineration of process fumes in boilers and recuperative thermal oxidiser. Primary incineration of non-condensable gases in boilers and recuperative thermal oxidiser. Boilers backed up by automatic divert of CO to PASCF (pre-acid scrubber carbon filter) Routine CO airflow and pressure measurements Routine Carbon filter outlet gas VOC monitoring	
Abnormal Events	**Risks**	**Actions Required**	**Documents/management system controls**
CO duct blockage CO scrubber blockage	Insufficient extraction from LEV causing odour emissions from scrubbers	• Routine inspection / cleaning of ducts and scrubber • Shutdown to clear ducting / scrubber	
Boiler incineration failure	Insufficient extraction from LEV causing odour emissions from scrubbers	• Automatic divert to PASCF • Service contract in place with the equipment manufacturer	
High VOC's on Carbon filter exhaust	High load to No.1 scrubber	• VOC's monitoring monthly • Carbon filter hours monitored	

		• Carbon replaced if high VOC's detected or hours run exceeds threshold	
No.1 Scrubber Failure	PASCF Unable to Operate	• PPM system for regular maintenance • Critical spares available on site • If unable to operate; recuperative thermal oxidiser must be used to receive non-condensable gases even if the steam is not required • Inform the Environment Agency for a pro-longed breakdown via a Schedule 5 form • Shutdown the Poultry process until the scrubber can be repaired	

Odour Complaints Procedure

Any complaints regarding odour from the site are investigated according to the Odour Complaints Procedure. If a complaint is received directly from a member of the public or the Environment Agency it is investigated by a member of management, or a Team Leader and the findings recorded on the Odour Complaint Investigation Form. The investigation form records the following information:

- Date and time of the complaint
- Name and address of the complainant (if they wish to provide this information)
- Direction of the complainant from the site
- Weather conditions including wind direction and speed, temperature
- Plant operational status
- Scrubbing Tower analysis
- If the boilers are incinerating or if the Carbon Filter is operating
- Findings from a tour of the boundary
- Findings from a tour of the complaint location
- Any likely cause and source of the odour
- Any incoming raw material deliveries or product dispatches at the time of the complaint

Any complaint received directly to site is recorded and shared with the regulator. The findings of the investigation are provided to the Environment Agency, via a schedule 5 notification.

If the source of the odour or a likely source of the odour is found following the investigation, this is raised as a non-conformance requiring corrective action.

Complaints can be made when the plant is operating normally, and all the appropriate control and monitoring measures are in place. In these circumstances a non-conformance would not be raised.

In some instances, complaints are received from the Environment Agency sometime after a complaint has been lodged. For these instances the above information is provided to them with the exception of the findings from boundary and complainant location tours.

Offsite Odour Monitoring

- To be undertaken daily by a member of the site management or office team.
- The weather data will be obtained from the wind crane and recorded.
- Potential receptors as set out on page 6 who are downwind of the factory are visited.
- The weather conditions, factory operating status and any odours detected will be recorded. The level of odour will be assessed on a scale of 1-10.
- Feedback from the offsite monitoring will be presented at the daily site meeting.
- If required, a second assessor will visit the location.
- If an odour is identified, factory operations will be reviewed to try and identify the source.
- If required, the process will be stopped for investigate further once the cause has been identified.
- Odours from alternative sources will be recorded in the event a complaint is mistakenly sent to Sarval.

Odour Complaints Investigation Form

On receiving the complaint from a member of the public or the EA, this form shall be filled in by a responsible person

Date of Complaint ..... Time of Complaint .....
Date Received ..... Time Received .....
Name of Complainant .....
Address of Complainant .....
Complainant to be contacted .....
Direction of Complainant From Factory .....
Wind Direction ..... Wind Speed .....
Weather Conditions ..... Temperature .....
Factory Conditions .....
Plant/Process Operating ..... Doors Closed .....

Odour Control Analysis:

	Reading	Target
Scrubber 1 pH		< 9.2 pH
Scrubber 1 Redox		> 600 mv
Scrubber 2 1st Stage pH		> 2.5 pH
Scrubber 2 2nd Stage pH		< 9.2 pH
Scrubber 2 2nd Stage Redox		> 600 mv
Scrubber 3 1st Stage pH		> 2.5 pH
Scrubber 3 2nd Stage pH		< 9.2 pH
Scrubber 3 2nd Stage Redox		> 600 mv

Odour Control Analysis Time Checked	

Odour Assessment
Scrubber No1 ..... Scrubber No2 .....
Scrubber No3 .....

Boiler Incineration
Boiler 1 .....
Boiler 2 .....
Thermal Oxidiser .....

Carbon Filter Running .....

RM Deliveries at time of Complaint ..... if yes please specifiy .....

Outgoing Product Loads at time of Complaint ..... if yes please specifiy .....

Any Conditions relevant to the complainant on site .....

Tour of Boundary ..... If No, State why .....

Tour Location .....

Likely Cause and Source of Odour or Other Relevant Information .....

Signed ..... Position .....

Revision Date: March 15th 2023 Revision 1 Sarval/EnvRec/015

Complaints History

The annual complaints received per year are as shown below:

Table 2 – Odour Complaint Numbers.

2012	25	2018	9
2013	39	2019	7
2014	28	2020	3
2015	15	2021	14
2016	25	2022	14
2017	5	2023	2

Appendices

Odour Control Monitoring Sheets

DAILY READINGS & RECORD DOCUMENTS.

CONTROL PANEL READINGS

These reading are done by the shift operator every 4 hours. Record (Environmental PEMS Log) the readings are pH, Redox, Water flows and checking the sniff tubes.

NIGHT & WEEKEND ODOUR CHECKS.

These reading are done by the shift operator every 4 hours. Record (Environmental PEMS Log) the readings are pH, Redox, Water flows and checking the sniff tubes.

ODOUR CONTORL TEST RESULTS.

The tests consist of pH, Chlorine, Hydro Sulphide and also Draegers. There are done every week by the Environmental Tech.

Environmental PEMS Log

Responsibility = Team Leader

CROWE TOWERS SHIFT CHECKS

Date

Trends

Log time and actions

E.P.A. Monitoring

		Target	Min	Max	06.00.00	10.00.00	14.00.00	18.00.00	22.00.00	02.00.00
No. 1 Scrubber	pH	9.25	9	10						
	Redox (mv)	600	550	700						
	Air Assessment	Good								
	No. 1 Make up H20 l/min	15	15	20						
No. 2 Scrubber	pH 1st stage	2	1.5	2.5						
	pH 2nd Stage	9.25	9	10						
	Redox (mv)	600	550	700						
	Air Assessment	Good								
	1st Stage Overflow Present	Yes	Yes	na						
	2nd Stage Overflow Present	Yes	Yes	na						
No. 3 Scrubber	pH 1st stage	2	1.5	2.5						
	pH 2nd Stage	9.25	9	10						
	Redox (mv)	600	550	700						
	Air Assessment	Good								

Temperature °c

Wind speed mph

Wind direction

Weather conditions

Remarks

External Doors closed

Boiler Stack

Emissions visual observed (min 6 mins)

By: Fuel:

Test

Online Yes No

Comments

EFFLUENT PLANT CHECKS

Pit Level Check	50	10	75									
Ferric Chloride pH	5.4	5	5.5									
Caustic pH	5.5	5.4	5.6									
Ferric Set Point	20	10	30									
Ferric Dosing	Yes											
Polymer Dosing	Yes											
Polymer Set Point	25	20	30									
Flocculation	Yes											
Site Water	Yes											
Tests Carried Out By:												

SHIFT CHECKS

	Target	Min	Max		06.00.00	18.00.00		
No.1 Circulation Pump Pressure (PSI)	tba	tba	tba	Pressure =			PSI	Taken By:
No.2 1st Stage Circulation Pump	tba	tba	tba	Pressure =			PSI	Taken By:
No.2 2nd Stage Circulation Pump	tba	tba	tba	Pressure =			PSI	Taken By:
No. 3 1st Stage Circulation Pump	tba	tba	tba	Pressure =			PSI	Taken By:
No. 3 2nd Stage Circulation Pump	tba	tba	tba	Pressure =			PSI	Taken By:
No.2 1st stage Make up H_20 l/min	20	20	30	Quantity			l/min	Taken By:
No.2 2nd stage Make up H_20 l/min	20	20	30	Quantity			l/min	Taken By:
No.3 1st stage Make up H_20 l/min	20	20	30	Quantity			l/min	Taken By:
No.3 2nd stage Make up H_20 l/min	20	20	30	Quantity			l/min	Taken By:
Hotwell Temp	95	85	99	Temperature			°c	Taken By:

Date:	Scrubber 1		Scrubber 2		Scrubber 3	
Operator:	In	Out	In	Out	In	Out
Triethylamine						
Hydrogen Sulphide						
Mercaptan						
Ammonia						

HYDRAZINE

Date:	Scrubber 1		Scrubber 2		Scrubber 3	
Operator:	In	Out	In	Out	In	Out
Triethylamine						
Hydrogen Sulphide						
Mercaptan						
Ammonia						

HYDRAZINE

Date:	Scrubber 1		Scrubber 2		Scrubber 3	
Operator:	In	Out	In	Out	In	Out
Triethylamine						
Hydrogen Sulphide						
Mercaptan						
Ammonia						

HYDRAZINE

Date:	Scrubber 1		Scrubber 2		Scrubber 3	
Operator:	In	Out	In	Out	In	Out
Triethylamine						
Hydrogen Sulphide						
Mercaptan						
Ammonia						

HYDRAZINE

Odour Control Maintenance Schedule

Asset	Maintenance Description	Frequency
No.1 Scrubber	Drager Tests, Free Chlorine &pH Calibration	Weekly
No.2 Scrubber	Drager Tests, Free Chlorine &pH Calibration	Weekly
No.3 Scrubber	Drager Tests, Free Chlorine &pH Calibration	Weekly
Carbon Filter	Drager Tests, Free Chlorine &pH Calibration	Weekly
All Scrubber Fans &Pumps	Gearbox Oil Inspection	Two Monthly
All Scrubber Fans &Pumps	Grease Inspection &Replacement	Monthly
Scrubber Fans	Belt Inspection	Three Monthly
Pre-Incineration Scrubber Fan	Belt Inspection	Three Monthly
Carbon Filter Fan	Belt Inspection	Three Monthly
Scrubber Fans	Bearing Condition Monitoring	Three Monthly
No.1 Scrubber	Acid Wash	Six Monthly
No.2 Scrubber	Acid Wash	Six Monthly
No.3 Scrubber	Acid Wash	Six Monthly
Carbon Acid Scrubber	Hot Water Wash	Monthly
Pre-Incineration Scrubber	Drain, Inspection &Internal Clean	Fortnightly
No.1 Scrubber	Internal Inspection &Assessment	Annually
No.2 Scrubber	Internal Inspection &Assessment	Annually
No.3 Scrubber	Internal Inspection &Assessment	Annually
Carbon Acid Scrubber	Internal Inspection &Assessment	Annually
Pre-Incineration Scrubber	Internal Inspection &Assessment	Annually

Odour Control & Extraction Schematic

Room Air Extraction

Concentrated Odours

Legend	
Poultry Non-Condensable Gases	
Feather Non-Condensable Gases	
Poultry Process LEV's	
Room Air	
Meal Cooler/Drag Chain Extraction