2 Sisters Llangefni – Safe System of Work

TASK Ammonia Sampling Of Surface Water	**LOCATION** Front Exit Gate & Dispatch Interceptor Pit	**CYM-SSOW-ENG-AMM01**

1	Ensure PPE is worn i.e. gloves, high visibility vest	
2	Check equipment is clean and suitable for sampling i.e. drain keys, water collector and water container.	
3	Ensure area where sample is to be taken is safe and use barriers if necessary to cordon off area. Using the drain keys open the drain covers. Take a sample of the surface water drain using the water collector and flush the water to drain. Now take another sample and put it into the water container. Replace drain cover and take sample to effluent plant for testing.	
4	Pallintest as follows. Remove the cap of the tube test ammonia/100(Nessler) tube and add 0.5mL of the water sample. Add 12 drops of tube test ammonia (Nessler) reagent. Leave to stand for 1minute to allow colour development. Select photo107 on photometer. Use an unused (blank) tube test ammonia/100n (Nessler) tube to set the blank on the photometer. Select blank by pressing ok. Put the sample tubetests into the photometer. Press ok on the sample to get the result displayed as ml/1N. Record reading.	

5	Dispose of the sample down the drain. Dispose of the tubetest into the bin. Take the bin to the skip at the end of the shift.	

Report on bund failure 08.06.16

On Wednesday 8th June, Welsh water came to site as they were having issues with the treatment water being presented to them.

On checking at the DAF plant, the DAF operation was optimal and their was no issues with the outgoing foul water, however, when lifting an outgoing foul drain, it was evident that it was contaminated with blood.

As this was a major issue, the DAF and its pumps were stopped, but as the DAF was working normally, this had no bearing on the discharge. This proved a major cause for concern and a number of foul drains were investigated to try and locate the source of the issue.

All investigations appeared to indicate that the problem source was within the DAF plant room although this could not be seen.

A long serving engineer then recalled that approx. 20 years ago, a drain under the DAF had been blocked. This was not indicated on the new drainage plan that had been commissioned earlier in the year.

It was apparent that this was the most likely potential of the source of the problem and the GM instructed contractors who were working on site to assist in smashing open sealed drain covers to investigate.

Once the drain covers were removed, it became evident that the bund had failed. Confined space equipment was immediately brought to site and a new bund was used as a temporary measure to close this drain. On clean up, the original bund was found in a perished state which confirmed the source of the issue.

At all times, Welsh water were on site and were satisfied with the level of urgency and temporary works that was undertaken.

We then agreed the following;

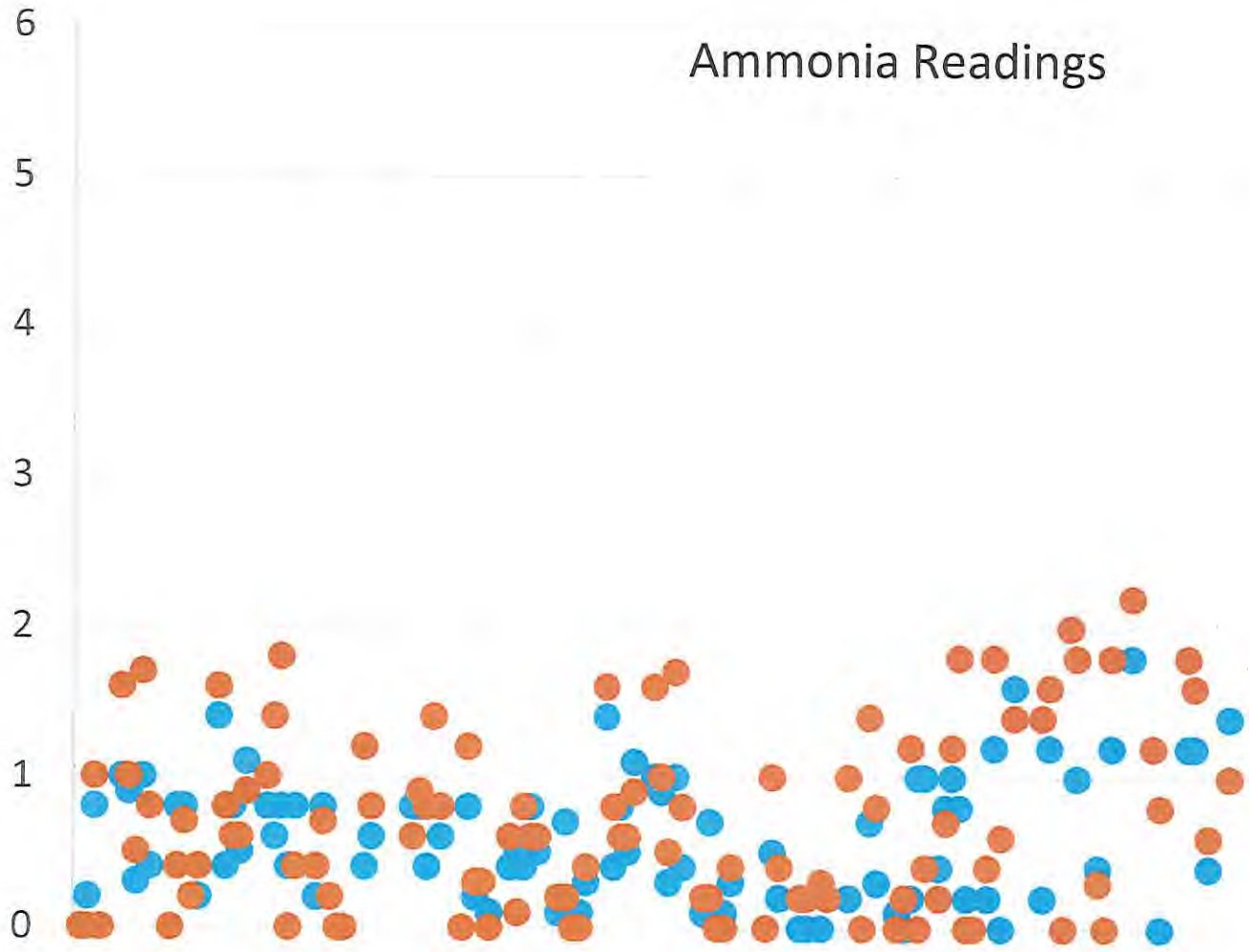
- CCTV of Daf plant – This has now been completed.
- Permanent fix of bunded drain- Contractor has been instructed, work planned for 05th Sept.
- Permanent covers for the broken access grates – as above
- Improved sampling tap and pipework for auto sampler– as above
- Flow meter upgrade & re-site to DAF - as above
- Compressor repair/replacement – new compressor is now on site, await install.

I hope this is sufficient at this time but I will keep you updated as things progress.

Regards

Steve Jones

05.08.16


Ammonia Readings
6
5
4
3
2
1
0

Maintenance Work Order No: P36358

Site	CYMRU	2 Sisters Llangefni				Date Issued	15/08/16
Asset	YARD-DV1	Drainage check valve				Requested	
		Surface water shut off valve				Department	
Location	OPENING SIDE OF GATE		Position			Telephone	
Task	YARD-DV1+2	Drainage check valve 1 weekly checks					
	Person	Team	Trade	No of Men		Authorised	
Primary						Work Type	PC
Additional						Permit	Priority

Work Required

1] Lift drain cover
2] Press button hold for 5 seconds
3] Check for correct operation of drain valve

Parts Required Spares Kit

Remarks:

Work Done by: Time Started:

Date: Time Finished:

Work Complete: Yes / No Time Taken:

Maintenance Work Order No: P36359

Site	CYMRU	2 Sisters Llangefni			Date Issued	15/08/16
Asset	YARD-DV2	Drainage check valve			Requested	
		Surface water shut off valve			Department	
Location	FAR SIDE OF GATE		Position		Telephone	
Task	YARD-DV1+2	Drainage check valve 1 weekly checks				
	Person	Team	Trade	No of Men	Authorised	
Primary					Work Type	PC
Additional					Permit	Priority

Work Required

1] Lift drain cover
2] Press button hold for 5 seconds
3] Check for correct operation of drain valve

Parts Required Spares Kit

Remarks:

Work Done by: Time Started:

Date: Time Finished:

Work Complete: Yes / No Time Taken:

ENVIRONMENTAL ASPECTS AND IMPACTS
Ref: EP 201

Purpose To describe the process to be followed when assessing environmental risk through aspects and impacts

Scope All site activities

Responsibility

Group:

Group Sustainability Director – responsible managing the groups risk register

Site:

It is the responsibility of Site Managers to ensure environmental risks have been considered for all activities where there are significant environmental aspects and when writing procedures/SOPs.

It is the responsibility of Site Managers to ensure that any environmental controls deemed necessary are effectively implemented

Procedure

Group

1 No action

Site

2 Each site will produce an environmental risk register detailing the environmental aspect and impacts of its operation

3 The Group Environmental risk register will be used to produce this, ensuring the scoring system is aligned and consistent with the Group Risk Assessment process and scoring.

4 The Environmental Risk register is provided with examples of risks, impacts and scoring to improve consistency of scoring across the Group.

5 Each site delegates responsibility for managing the risk assessment process to a manager. For Llangefni this is the HSE manager.

6 The environmental risk register will be completed by the HSE manager.

During completion consideration will be given to the changing risks from;

- Normal operating conditions
- Abnormal operating conditions
- Emergency situations

7 The site should consider the following potential issues, amongst other things;

- Energy use
- Waste production, storage and disposal
- Clean and waste water
- Refrigeration
- Oil and chemical storage
- Areas inside and outside factory
- Local biodiversity and protected areas
- Transport and DC's
- Staff

8 Each risk will be documented on the risk register, with its impacts and likelihood and severity scoring as per the table in Appendix 1. This will automatically generate a colour rating for the risk.

9 Any risk that is identified as orange will be considered as significant.

10 All significant risks will have two actions:

i. On the risk register, actions and owners of those actions defined to implement controls

ii. Specific control procedure documented within this environmental management system.

Review

11 The environmental risk register will be reviewed at least annually, or when there are significant changes to the following;

- Change in legislation
- Change in customer requirements
- Change in group requirements
- Change in industry requirements
- Following an accident, incident of near miss.

12 During Audit or Site review by Group the risk register will be reviewed and considered for appropriateness.

See overleaf for Appendix 1 – Severity Rating System

Appendix 1 - Severity Rating

Rating	Description	Environment	Legal	Financial	Reputational	Operational
4	Catastrophic	Major environmental incident resulting in significant impact. Requires management by external authorities and/or higher level of 2SFG resource. Eg major river pollution.	Company or individuals facing high profile prosecution, major fine and compensation, potential loss of permit or consent, threat of closure	>£1m	Permanent relationship damaged, threat to future business	Full lines stopped, clients contacted to inform of delays of full deliveries
3	Major	Moderate impact requiring management response to aid recovery. Reportable to authorities eg fuel tank spillage	Breach with threat of fine. Regulators require action before continued operations. Formal warning letter from regulators. Minor fine plus compensation or civil sanction	£100k to £1 million	Failure of client targets, Significant relationship damage. Required to provide corrective action plan	Operations impacted so only partial delivery to clients is possible.
2	Moderate	Local impact requiring management response, but from which there is natural recovery eg recovery of fly-tip waste, silt in to river	Minor breach of licence. Formal actions required by regulators, negative scoring against permits, minor civil sanction	£10k to £100k	Clients aware and requesting response, may impact on client targets	Reduced volume or short delay to operations during correction
1	Minor	Minor environmental impact ie oil drips	Suspicion of bad practices. Recommendations by regulators	<£10,000	No impact	No delay to operations

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Activities / Products / Services	Aspect	Category	Impact: Resource depletion	Ozone depletion	Global warming	Air pollution	Groundwater contamination	Water pollution	land contamination	Comunity Impact	Waste management	Risk to human health	Risk to wildlife	Loss of habitat	Detail	Situation N:normal U:unusual E:emergency	Significant Impact if controlled by a Permit	Control Measures	Severity Rating
Production																			
Housing live animals	Animal waste (manure) generated	waste				X	X	X	X		X				If untreated and not properly handled, wastes from animals emitted into the environment can cause widespread contamination of the air, surface water, groundwater and land For example, if mishandled, manure may contaminate water supplies with nitrogen, phosphorus, inorganic salts, organic solids and microorganisms. If present in sufficient quantities, those contaminants can cause considerable problems. Phosphorus is one of the most common and serious surface water contaminants causing eutrophication.	N	Y	Effluent Plant	2
	Odours generated	odours								X					Offensive odours can be emitted into the environment and can negatively impact human health and quality of life	N	Y	Procedures	2
	Water effluent generated from daily washing of lorries, modules and crates	effluent						X			x		X		Nutrients: essential to all forms of life, but can be damaging in excess quantities; examples are nitrate and phosphate, which encourage algal blooms; these in turn prevent light entering the water, and so damage plants. Persistent chemicals: (for example polychlorinated biphenyls - PCBs): do not break down in the environment. They can therefore accumulate in the environment, animals and man. Detergents: detergents cause foaming of water through the reduction in surface tension. The reduction in surface tension interferes with the behaviour of many insects and crustaceans and aquatic animals. The detergents may contain phosphates (nutrients) as water softening agents. Metals: metals in water are normally present with other ions such as carbonates, chlorides, sulphates or nitrates. Solubility varies with the metal, pH, temperature and salinity. Nickel carbonate, sulphide and oxide and insoluble in water whereas, nickel chloride, sulphate and nitrate are soluble in water. Under acidic conditions, insoluble toxic metals can become soluble. **Control Measure = DAF Plant**	N	Y	Effluent Plant	2
Unloading, hanging, stunning, killing and bleeding	Water effluent generated from sprays on killing line, water in stun bath	effluent						X					X		When discharged into a river, bacteria will feed on the organic material, increasing in numbers and using up oxygen through metabolism. Where a significant quantity of BOD is discharged into a river, the result can be an anaerobic plug of water passing down the river killing all aerobic species. Suspended Solids (SS) cause turbidity in the water, reducing visibility and the penetration of light. This can interfere with the predator-prey relationship and reduces oxygenation of water by photosynthesis. Temperature affects the ability of water to hold oxygen: The higher the temperature the less oxygen the water can hold.	N		Effluent Plant	2
	Particulate emission in hanging room	odours										X			Dusty and odourous gases are emitted during the hanging of birds. This can have an impact of human health and this is why operators are required to wear protection masks. Before the odour smell reached the outside it is dissipated and has no effect on the community.	N	Y	Procedures	1
	Animal waste (blood) produced (blood waste is directed to dedicated blood tank)	ABP						X			X				The disposal of blood as sewage can drive up the Biological Oxygen Demand in wastewater streams and indirect waste management impacts (see Indirect Impacts)	N	Y	Blood Scrubber	2
	Generation of animal-by product waste: heads (Cat.3), feet (Cat.2), feathers and viscera	ABP									X				See indirect Impacts (waste and Animal By-Products)	N	Y	Procedures	2
	Water used for moving heads is recyled	water	X												The water used for moving heads is recycled. Excess water use could lead to depletion of a finite resource.	N	Y	Effluent Plant	1
	Effluent generated after heads are screened off and discharged in trailer	effluent	X					X					X		see above		Y	Effluent Plant	1
	electricity used in bath stunner	energy	X		X	X									Energy is associated with environmental concerns that are high on the political agenda, and it is a critical issue to be addressed in the move towards a more sustainable society. fossil fuel based energy is particularly associated with atmospheric pollution issues at local, regional (transboundary) and global levels, including air quality, ground level ozone, acid rain and global warming/ climate change.	N	Y	Procedures	1

Activities / Products / Services	Aspect	Category	Impact												Detail	Situation N:normal U:unusual E:emergency	Significant Impact if controlled by a Permit	Control Measures	Severity Rating
			Resource depletion	Ozone depletion	Global warming	Air pollution	Groundwater contaminati	Water pollution	land contamination	Comunity Impact	Waste management	Risk to human health	Risk to wildlife	Loss of habitat					
Blood storage	Odour generated	odours								X					Positive displacement tanker filling i.e. only need to treat the volume of air displaced - not huge quantities from vac pump on tanker. Displaced air from the tanker goes through the deodoriser (large scrubber). Re-routing of exhaust from the deodoriser through the underground sump. Vertical tank bottom discharge which is easierto empty fully, leaving no residue. Blood tank emptied approximately every 2 days. Positive displacement pump to fill the blood tank.	N	Y	Blood Scrubber	1
	Emergency	waste						X					X		If the blood tank was to burst it would end up in the ETP. Blood has a very high BOD content and would have a serious impact if it would end up in a water course.	E	Y	Effluent Plant	3
Birds are scaled and defeathered	Use of hot water to fill up the scald tank once a day	energy	X		X	X									see above and Indirect Aspects of sourcing energy and Impacts associated to the use of the boilers	N	Y	Procedures	1
	Use of steam from the boiler in the heat exchanger of the scald tank	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N	Y	Procedures	1
	Use of fast flowing water to move the feathers	water	X												After the feathers go to the feaherpress and the water is recycled	N	Y	Effluent Plant	1
	ammonia odour from scald tank	odours								X					The air from the scald tanks is feed into a chemical scrubber (Parson Scrubber) , which removes the ammonia from the air stream . The unit is PLC controlled , checked daily and is maintained on a monthly service	N	Y	Scald Scrubber	1
Feathers loaded into a HGV trailer	Use of continuous water to flush out feathers	water	X													N	Y	Effluent Plant	1
	Animal by-Products	ABP									X				See indirect Impacts (waste and Animal By-Products)	N	Y	Procedures	1
	Odours generated	odours								X					Historically odours were associated with the disposal of wet feathers from the defeathering process. This odour has been removed by passing the feathers through a dewatering feather press which removes the water before the feahters are disposed into an open top trailer.	N	Y	Effluent Plant	1
Feet are removed	Water to flume the feets can not be recycled due to restrictions of the Meat Hygiene Service	water	X													N	Y	Effluent Plant	1
	Generation of animal-by products	ABP									X				See indirect Impacts (waste and Animal By-Products)	N	Y	Procedures	1
	Odours generated	odours							X							N	Y	Effluent Plant	1
Viscera is then pumped to a waste offal trailer in the yard to the rear of the evisceration building	Generation of animal-by product waste.	ABP									X				See indirect Impacts (waste and Animal By-Products)	N	Y	Procedures	1
	high water use throughout the process for lubrification, cleaning and as transport medium	water	X													N	Y	Effluent Plant	1
	Odours generated	odours								X						N	Y	Procedures	1
	Generation of effluent	effluent						X					X		see above	N	Y	Effluent Plant	1
Final wash of chicken	Use of water	water	X													N	Y	Effluent Plant	1
	Generation of effluent	effluent						X					X		see above	N	Y	Effluent Plant	1
Birds are chilled in Air Chiller (2km of overhead chain) down to 4C	Use of refrigeration plant (see Engineering)	energy	X	X	X	X									see Engineering Aspects	N	Y	Ammonia Plant	1
Carcasses are graded and segregated automatically by weight and transferred into baskets	Use of energy for grading machine	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N	Y	Refridgeration Equipment	1
Baskets go for 12hours into maturation chill process	Airchiller using R-22	energy	X	X	X	X									see above and Indirect Aspects of sourcing energy	N	Y	Refridgeration Equipment	1
Automatic cutting machines remove wings and legs	Electricity used for machinery	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N	Y	Procedures	1
Packaging of wings, legs and fillets	Use of packaging (see Indirect Aspects)	waste	X								X				Ultimately all the packaging will end up in the UK waste stream	N	Y	Procedures	1
	Consumption of goods (labels)	waste	X								X				See Indirect Aspects associated with waste management	N	Y	Procedures	1
Metal detector	Electricity used by machine	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N	Y	Procedures	1
Shippment of goods	Use of shrinkwrap around pallets	waste									X				Ultimately all the packaging will end up in the UK waste stream	N	Y	Procedures	1
	Disposal of broken pallets and crates	waste									X				See Indirect Aspects associated with waste management	N	Y	Procedures	1
	Significant noise while loading trailers	noise								X					The trailers typically now have air suspension which is used to ensure that the trailer floors are level with the surface of the delivery bay. This eliminates any 'step' between the delivery bay and the trailer and preventsbanging as forklifts enter and exit the trailers.	N	Y	Procedures	1

Ref	Issue No	Date	Page	Prepared By	Authorised By	Review Date

| | | | Impact | | |

Activities / Products / Services	Aspect	Category	Impact												Detail	Situation N:normal U:unusual E:emergency	Significant Impact if controlled by a Permit	Control Measures	Severity Rating
			Resource depletion	Ozone depletion	Global warming	Air pollution	Groundwater contaminatio	Water pollution	land contamination	Comunity Impact	Waste management	Risk to human health	Risk to wildlife	Loss of habitat					
Engineering																			
Maintenance and repair of machinery	Disposal of pieces of machinery	waste									X				See Indirect Aspects associated with waste management	N	Y	Procedures	1
	Painting - emission of VOC	air			X	X						X			In the presence of sunlight, VOCs can react with nitrogen oxides to create ground level ozone and photochemical smog, which can in turn contribute to pollution of the atmosphere. Some individual VOCs are believed to be a threat to human health. For example, benzene is classified as carcinogenic (cancer-causing) to humans and hexane as a cause of nervous s ystem disorders	N	Y	Procedures	1
	Gases generated by welding: CO, CO2, NOx, O3, VOC)	air			X	X						X			CO and CO2 are Green House Gases which are responsible for global warming. All these pollutants can collectively impact urban air quality.	N	Y	Procedures	1
Air compressors	High use of electricity	energy	X		X	X										N	Y	Procedures	1
	Oil leak	chemicals							X						The air compressors are located directly next to a grased area. A historic oil spillage contaminated this area but the spillage has been cleaned (see SPMP). Futur oils spillages could potentially contaminate the land again.	U	Y	Procedures	1
Purchasing of machinery, tools etc	Disposal of packaging waste	waste									X				See Indirect Aspects associated with waste management	N	Y	Procedures	1
	Purchasing of enery efficient motors	energy	X		X	X									The site has an Energy policy to buy energy efficient motors	N	Y	Procedures	1
Boilers	Energy used in steam generation	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N	Y	Procedures	1
	Air emmission from boilers (NOx, CO, SO2 and particulates)	air			X	X									These pollutants collectively impact urban air quality. SO2 results from impurities in the fuel; smoke and unburnt hydrocarbons from improper combustion conditions/ incomplete combustion; and NOx from impurities in the fuel and/ or reaction of combustion air (02 and N2) in high temperature flames. Pollutants may chemically react in the atmosphere to produce secondary pollutants such as acid rain and ozone. Carbon monoxide is the primary global-warming gas.This pollution has multiple effects, not only extending the range of tropical pests and diseases but increasing the likelihood of fires and severe weather eventssuch as storms, floods and drought	N	Y	Procedures and PM	1
	Storage of fuel	chemicals				X	X	X	X				X		See storage of chemicals	N	Y	Procedures	2
Ammonia System	Fugitive emissions of ammonia to air	air				X				X		X	X		Ammonia risk assessment completed in March 2014 and all corrective actions are being worked on . New Emergency Procedure communicated in July 2015	U	Y	Ammonia Plant and Service Contract	3
	Heat from ammonia plant	air			X										Reduction in heat output by maximisation of ammonia efficiency and maintenance	N	Y	Ammonia Plant and Service Contract	1
	Potential escape during storage and maintenance operations	air				X				X		X	X		see above	U	Y	Ammonia Plant and Service Contract	3
	Eletricity used in compressors	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N	Y	Ammonia Plant and Service Contract	1
Refrigeration system	Fugitive emissions of refrigerants to air	air		X	X							X	X		R22 was replaced in 2014	U	Y		3
	Heat from chiller plant	air			X										Reduction in heat output by maximisation of refrigeration efficiency and maintenance	N	Y	Ammonia Plant and Service Contract	1
	Potential escape during storage and maintenance operations	air		X	X							X	X		see above	U	Y		3
	Eletricity used in compressors	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N	Y	Procedures	1
Forklifts	Recharge of forklift batteries	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N	Y	Procedures	1
Storage of chemicals and oils	Spillages and potential for escape and pollution	chemicals				X	X	X				X	X		Spillages of chemicals can pollute the land, groundwater and the river but can also be detrimental to human health. Individual risk assessments have been done on all storage facilities . During 2015 new bunded storage will be purchased .	U	Y	Procedures	3
Effluent treatment plant (DAF plant)																			
2 *Underground tanks (150m3)	Odours generated	odours								X					A system for dosing a Class A facultative microbe into the effluent system has been installed and is functioning. The microbe neutralises both nitrogenous and sulphurous compounds to minimise odour generation. Preliminary indications show that this has had a significant beneficial effect on the odour from the effluent plant sludge.	N	Y	Effluent Plant	1
Pumped to pit (48m3)	energy used in pumps	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N	Y	Effluent Plant	1
Solids removed by a 0.75mm screen	solids collected in dolav	waste									X				See Indirect Aspects associated with waste management	N	Y	Effluent Plant	1
balancing tank (350m3)	odours generated	odours								X					The balancing tank is covered in order to minimise the generation of odours and is connected to a carbon filter . Double carbon filter to be installed in 2015	N	Y	Effluent Plant & Carbon Filter	1
DAF unit	coagulation (ferric sulphate or ferric chloride)	chemicals	X												see also storage of chemicals (Engineering)	N	Y	Effluent Plant	1
	flocculation (polyelectrolytes)	chemicals	X												see also storage of chemicals (Engineering)	N	Y	Effluent Plant	1
	pH adjustment (caustic soda to pH 5.5)	chemicals	X												see also storage of chemicals (Engineering)	N	Y	Effluent Plant	1
	sludge is removed from the surface by a scraper	waste									X				See Indirect Aspects associated with waste management	N	Y	Effluent Plant	1

Activities / Products / Services	Aspect	Category	Impact												Detail	Situation N:normal U:unusual E:emergency	Significant Impact if controlled by a Permit	Control Measures	Severity Rating
			Resource depletion	Ozone depletion	Global warming	Air pollution	Groundwater contaminati	Water pollution	land contamination	Comunity Impact	Waste management	Risk to human health	Risk to wildlife	Loss of habitat					
	odour generated from DAF unit and sludge tanks	odours								X							Y	Procedures	1
sludge discharged into sludge tank	Diposal of sludge	waste									X				See Indirect Aspects associated with waste management	N	Y	Procedures	1

			Impact																	
Activities / Products / Services	Aspect	Category	Resource depletion	Ozone depletion	Global warming	Air pollution	Groundwater contamination	Water pollution	land contamination	Comunity Impact	Waste management	Risk to human health	Risk to wildlife	Loss of habitat	Detail	Situation N:normal U:unusual E:emergency	Significant Impact if controlled by a Permit	Control Measures	Severity Rating
	Odour generation	odours													Rudimentary scrubbing systems, including the use of odour masking agents, have been fitted to the sludge tank vents	N	Y	Procedures	1
effluent discharged into sewer		effluent						X					X		The quantity and constituents of discharge are detailed in the discharge consent. Under the new European Waterframework directive these conditions are likely to become more demanding.	N	Y	Effluent Plant	2
Drainage sytem (colour coded)	Potential collapsed drains	pollution					X	X	X						A CCTV survey has been undertaken and collapsed drains have been identified and will be repaired.	U	Y	Procedures	1
	color coded	pollution													The color coded drains allow to know where the water is going in case of a spill and take the appropriate measures.	N	Y	Procedures	1
	discharge into surface water from site run-off	water						X					X		The quantity and constituents of discharge are detailed in the discharge consent. Contribution to flooding and potential pollution of controlled water through contamination of surface water run-off.	N	Y	Procedures	2
Production associated processes																		Procedures	Procedures
Conveyor belt	Electricity used by conveyor belt	energy	X		X	X					X				see above and Indirect Aspects of sourcing energy	N		Procedures	1
Knife sterilising	Electricity used to heat water (single skin insulated)	energy			X	X									BAT would use double skin insulated knife steriliser bowls	N		Procedures	1
	Water use	water	X													N		Procedures	1
	Generation of effluent	effluent						X					X		see above	N		Procedures	1
Generation of floor waste throughout the whole production process	Generation of Animal By Products	ABP									X				See indirect Impacts (waste and Animal By-Products)	N		Procedures	1
Paper work (Quality sheets etc)	Consumption and disposal of paper	waste	X								X				See Indirect Aspects associated with waste management	N		Procedures	1
Cleaning of production floor	Storage, use and release of chemicals	pollution	X			X		X				X				N		Procedures	1
	Water use	water	X													N		Effluent Plant	1
	Generation of effluent	effluent						X					X		see above	N		Effluent Plant	1
Lighting	Use of fluorescent light bulbs	waste									X	X	X		Spent light bulbs may contain hazardous waste. Most older fluorescent light ballasts have small capacitors that contain high concentrations of PCBs. PCBs are toxic chemicals which have a history of persistent and potential ecological damage. The mercury used in the light bulbs represents a small part of the total mercury potentially entering the environment. While high amounts of mercury are obviously toxic, there is debate over the health effects at lower levels.	N	Y	Procedures	1
	Use of electricity	energy	X		X	X									Lighting is replaced with high frequency fluorescent fittings as required. Wherever possible energy efficient high bay lighting has been installed. All external lights are controlled by light sensors and are all high pressure sodium lamps. Lights fitted with motion sensors have been installed in the maturation chill.	N	Y	Procedures	1
Cleaning and personal hygiene																			
Hand washing	Hot water - energy	energy	X		X	X									see also boiler impacts	N		Effluent Plant	1
	Detergent	chemicals	X												see also storage of chemicals	N		Effluent Plant	1
	Antimicrobial Hand Rub	chemicals	X												see also storage of chemicals	N		Effluent Plant	1
	Use and disposal of hand towels	waste	X								X				See Indirect Aspects associated with waste management	N		Effluent Plant	1
	Generation of effluent	effluent						X					X		see above	N		Effluent Plant	1
Boot washing	Water use	water	X													N		Effluent Plant	1
	Electricity used by machine	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N		Effluent Plant	1
	Effluent	effluent						X					X		see above	N		Effluent Plant	1
Disposable hairnets	Disposing and using hairnets	waste	X								X				See Indirect Aspects associated with waste management	N		Effluent Plant	1
Tray wash	Water use	water	X													N		Effluent Plant	1
	Detergent	chemicals	X												See also storage of chemicals	N		Effluent Plant	1
	Generation of effluent	effluent						X					X		see above	N		Effluent Plant	1
	Odour generated	odours								X						N		Effluent Plant	1
Dolav wash	Water use	water	X													N		Effluent Plant	1
	Detergent	chemicals	X												See also storage of chemicals	N		Effluent Plant	1
	Generation of effluent	effluent						X					X		see above	N		Effluent Plant	1
Floor wash	Water use	water	X													N		Effluent Plant	1
	Use of detergent	chemicals	X												See also storage of chemicals	N		Effluent Plant	1
	Generation of effluent	effluent						X					X		see above	N		Effluent Plant	1
	diposal of food debris	ABP									X				See Indirect Impacts (waste and Animal By-Products)	N		Effluent Plant	1
	use of foam detergent	chemicals	X												See also storage of chemicals	N		Effluent Plant	1
	foam detergent washed down with hot water	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N		Effluent Plant	1
Machinery washing	Water use	water	X													N		Effluent Plant	1
	Detergent	chemicals	X												See also storage of chemicals	N		Effluent Plant	1
	Generation of effluent	effluent						X					X		see above	N		Effluent Plant	1
Purchasing of cleaning products	Generation of packaging waste	waste									X				See Indirect Aspects associated with waste management	N		Procedures	1

			Impact																
Activities / Products / Services	Aspect	Category	Resource depletion	Ozone depletion	Global warming	Air pollution	Groundwater contaminati	Water pollution	land contamination	Comunity Impact	Waste management	Risk to human health	Risk to wildlife	Loss of habitat	Detail	Situation N:normal U:unusual E:emergency	Significant Impact if controlled by a Permit	Control Measures	Severity Rating
Module wash	Water use	water	X												Excessive use of water if cyclones are not cleaned regularly	N		Effluent Plant	1
	Use of detergent	chemicals	X												See also storage of chemicals	N		Effluent Plant	1

			Impact																	
Activities / Products / Services	Aspect	Category	Resource depletion	Ozone depletion	Global warming	Air pollution	Groundwater contaminati	Water pollution	land contamination	Community Impact	Waste management	Risk to human health	Risk to wildlife	Loss of habitat	Detail	Situation N:normal U:unusual E:emergency	Significant Impact if controlled by a Permit	Control Measures	Severity Rating	
Ref	Issue No	Date	Page				Prepared By								Authorised By	Review Date				
EP17	003	15/08/2016	1 of 4				R Bladon								P Ikin	01/08/2017				
Offices																				
Administrative work	Consumption of goods		X													N		Procedures	1	
	Consumption of energy (e.g electrical equipment and facilities)	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N		Procedures	1	
	Generation of waste (e.g paper)	waste									X				See Indirect Aspects associated with waste management	N		Procedures	1	
	Release of ozone from photocopier/laserprinter	air				X						X				N		Procedures	1	
	Disposal of fluorescent tubes	waste									X				See Indirect Aspects associated with waste management	N		Procedures	1	
	Disposal of paper	waste									X				See Indirect Aspects associated with waste management	N		Procedures	1	
	Diposal of batteries	waste									X				See Indirect Aspects associated with waste management	N		Procedures	1	
	Disposal of toner cartridges	waste									X				See Indirect Aspects associated with waste management	N		Procedures	1	
Use of Amenities (e.g kitchens and bathrooms)	Use/release of CFC substances from fridge	air		X												N		Procedures	1	
	Consumption of energy	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N		Procedures	1	
	Consumption of water	water	X													N		Procedures	1	
	Disposal and use of paper towels	waste	X								X				See Indirect Aspects associated with waste management	N		Procedures	1	
	Disposal and use of drink containers	waste	X								X				See Indirect Aspects associated with waste management	N		Procedures	1	
	Disposal of food scraps	waste									X				See Indirect Aspects associated with waste management	N		Procedures	1	
Cleaning of offices	Use of cleaning chemicals	chemicals	X												See also storage of chemicals	N		Procedures	1	
	Disposal of containers	waste									X				See Indirect Aspects associated with waste management	N		Procedures	1	
	Water use	water	X													N		Procedures	1	
	Disposal of dirty water	effluent						X					X		see above	N		Procedures	1	
Petrol station																				
Refuelling of tanks	Spillage of diesel	pollution					X	X	X				X		See also storage of chemicals	U	Y	Procedures	3	
Refuelling of tanks	Emission of VOC	air			X	X						X				N	Y	Procedures	1	
Refuelling of lorries	Potential spillages	pollution					X	X	X				X		This can occur if lorry driver leave the dispensing unit without observation (e.g. in order to go to the staff shop) and do not notice the overflowing	U	Y	Procedures & Fuel tank system	3	
Canteen/Staff facilities																				
Purchasing	Disposal of waste (packaging and food)	waste									X				See Indirect Aspects associated with waste management	N		Procedures	1	
Cooking	Use of electricity for oven	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N		Procedures	1	
	Use of gas for cooking	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N		Procedures	1	
	Odour	odours								X						N		Procedures	1	
	Noise	noise								X						N		Procedures	1	
	Disposal and use of cooking fat	waste	X								X				See Indirect Aspects associated with waste management	N		Procedures	1	
Serving food	Electricity to keep food hot	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N		Procedures	1	
Washing dishes	Electricitry used by dishwasher	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N		Procedures	1	
	Water used by dishwasher	water	X													N		Procedures	1	
	Detergent used by dishwasher	chemicals	X												See also storage of chemicals	N		Procedures	1	
	Effluent generated by dishwasher	effluent						X					X		see above	N		Procedures	1	
Cleaning of canteen	Use of detergent	chemicals	X												See also storage of chemicals	N		Procedures	1	
	Consumption of water	water	X													N		Procedures	1	
Pest Control																				
Subcontractor	Use of weed killer	chemicals	X												See also storage of chemicals	N		PTW	1	
	Use of pheromone traps	chemicals	X												See also storage of chemicals	N		PTW	1	
	Use of electric fly killer	energy	X		X	X							X		see above and Indirect Aspects of sourcing energy	N		PTW	1	
Waste disposal																				
Baling cardboard	Recycling of cardboard bales	waste								X	X				To be investigated	N	Y	Procedures	1	
Baling plastic	Recycling of plastic bales	waste								X	X				To be investigated	N	Y	Procedures	1	
Metal skip	Disposal of metal	waste									X				The metal will be recycled and is deviated from landfill.	N	Y	Procedures	1	
General waste compactor	Leaking of compactor	pollution						X		X					The general waste compactor only holds solid waste	U	Y	Procedures	2	
	Electricity used to compact	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N	Y	Procedures	1	
	Odour generated	odours								X						N	Y	Procedures	1	
Disposal of hazardous waste	Spillages, accidents or non-segregation	waste					X	X	X			X	X		Hazardous waste needs to be segregated and stored seperately because they could react together. These substances are hazardous and if handled unproperly they can have a significant impact on humans, pollute water or land.	N	Y	Procedures	1	
Laundry	Use of water	water	X													N		Procedures	1	
	Use of detergent	chemicals	X												See also storage of chemicals	N		Procedures	1	
	Generation of effluent	effluent						X					X		see above	N		Procedures	1	
	Use of electricity	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N		Procedures	1	
Transport (Fleet vehicles / staff travel)																				

Activities / Products / Services	Aspect	Category	Impact											Detail	Situation N:normal U:unusual E:emergency	Significant Impact if controlled by a Permit	Control Measures	Severity Rating
			Resource depletion	Ozone depletion	Global warming	Air pollution	Groundwater contaminati	Water pollution	land contamination	Comunity Impact	Waste management	Risk to human health	Risk to wildlife	Loss of habitat					
Refrigeration systems on lorries	Noise of compressors	noise								X					No external noise has been undertken , but is not classed as being significant	N	Y	Procedures	1
	Consumption of diesel or electricity	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N	Y	Procedures	1
Driving:	Noise of engines	noise								X						N		Procedures	1
	Consumption of diesel	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N		Procedures	1
- staff travel to work	Consumption of goods (e.goil)	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N		Procedures	1
	Generation of waste (e.g oil)	waste									X				See Indirect Aspects associated with waste management	N		Procedures	1
	Exhaust emission	air			X	X									These pollutants collectively impact urban air quality. SO2 results from impurities in the fuel; smoke and unburnt hydrocarbons from improper combustion conditions/ incomplete combustion; and NOx from impurities in the fuel and/ or reaction of combustion air (02 and N2) in high temperature flames. Pollutants may chemically react in the atmosphere to produce secondary pollutants such as acid rain and ozone. Carbon monoxide is the primary global-warming gas.This pollution has multiple effects, not only extending the range of tropical pests and diseases but increasing the likelihood of fires and severe weather eventssuch as storms, floods and drought	N		Procedures	1
	Use of dangerous goods(batteries)	waste									X				See Indirect Aspects associated with waste management	N		Procedures	1
	Generation of traffic	traffic								X						N		Procedures	1
	Potential oil leakage	waste						X								U		Procedures	1
	Waste generated from road and traffic sources	waste						X							These wastes may impact the environment by causing pollution of surface traffic sources waters.	N	Y	Procedures	1
Cleaning of vehicles	Storage, use and release of chemicals	chemicals	X												See also storage of chemicals	N	Y	Procedures	1
	Consumption of water	water	X													N	Y	Procedures	1
	Run-off water to foul sewer	effluent						X					X		see above	N	Y	Procedures	1
Road salt used in parking lots and outside factory	localised elevation of Sodium and Chloride concentration in soil and ground water	chemicals					X	X	X				X		Sodium and calcium chlorides can severely impact vegetation through soil contamination, direct foliar contact, and water pollution.	N		Procedures	1

Ref	Issue No	Date	Page	Prepared By	Authorised By	Review Date
EP17	003	15/08/2016	1 of 4	R Bladon	P Ikin	01/08/2017

Activities / Products / Services	Aspect	Category	Impact												Detail	Situation N:normal U:unusual E:emergency	Significant Impact if controlled by a Permit	Control Measures	Severity Rating
			Resource depletion	Ozone depletion	Global warming	Air pollution	Groundwater contaminati	Water pollution	land contamination	Comunity Impact	Waste management	Risk to human health	Risk to wildlife	Loss of habitat					
Indirect aspects																			
Driving: - Transport of goods and materials	Noise of engines	noise								X						N			
	Consumption of diesel	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N			
	Consumption of goods (e.goil)	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N			
	Generation of waste (e.g oil)	waste									X				See Indirect Aspects associated with waste management	N			
	Exhaust emission	air			X	X									These pollutants collectively impact urban air quality. SO2 results from impurities in the fuel; smoke and unburnt hydrocarbons from improper combustion conditions/ incomplete combustion; and NOx from impurities in the fuel and/ or reaction of combustion air (02 and N2) in high temperature flames. Pollutants may chemically react in the atmosphere to produce secondary pollutants such as acid rain and ozone. Carbon monoxide is the primary global-warming gas.This pollution has multiple effects, not only extending the range of tropical pests and diseases but increasing the likelihood of fires and severe weather eventssuch as storms, floods and drought	N			
	Use of dangerous goods(batteries)	waste									X				See Indirect Aspects associated with waste management	N			
	Generation of traffic	traffic								X						N			
	Potential oil leakage	waste						X								U			
	Waste generated from road and traffic sources	waste						X							These wastes may impact the environment by causing pollution of surface traffic sources waters.	N			
Indirect aspects																			
Growing of crops	Water use	water	X													N			
	Energy	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N			
	Use of GMO (Genetically Modified Organisms)											X	X		The modified gene from the modified plant can migrate into the wild fauna and modify the caracteristics of local species of plants. As the modified gene can come from any other organism it could potentailly trigger unexpected allergic reactions.	N			
	Use of Pesticides & Fertiliser	chemicals	X			X	X	X					X			N			
Farming of animals	Manure	waste					X	X			X				See Indirect Aspects associated with waste management	N			
	Energy for heating shed in the winter	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N			
	Energy used for cooling shed in the summer	energy	X		X	X									see above and Indirect Aspects of sourcing energy	N			
	Cleaning products used to clean the shed	chemicals	X													N			
	Water used for cleaning	water	X													N			
	Generation of dirty water	effluent						X					X		see above	N			
	Water used to feed animals	water	X													N			
	Noise of animals	noise								X						N			
	Odour of manure and animals	odours								X						N			
	Noise of animals in lairage	noise								X						N			
	Manure of animals in lairage	waste									X				See Indirect Aspects associated with waste management	N			
	Most farms sourcing the Sandycroft site are GCFG farms														GCFG is commited to reduce its environemtal impacts. The farms will now all come under IPPC and will deal with their impacts.	N			
Electricity supply	Generation and distribution of electricity	energy	X		X	X	X	X	X	X	X					N	Y		
Gas, diesel and oil supply (extraction of crude petroleum and gas)	Extraction, refining and supply of oil	energy	X	X	X	X	X	X	X	X	X				Consumption of huge quantities of gasoline leads to offshore oil spills, expansion of offshore oil drilling, toxic leaks from underground storage tanks, fallout from acid rain, and runoff from roads and highways.	N	Y		
Cleaning product supply	Manufacturing and distributing cleaning products	chemicals	X	X	X	X	X	X	X	X	X	X	X		Chemical companies use water and emit GHG, metal emissions to land, generate waste, emit VOC and use high quantities of electricity, gas, steam, hot water, refined petroleuk products etc)	N	Y		
Supply of plastic for packaging	Manufacturing and supplying of plastic products	waste	X		X	X		X							Plastics are made out of non-renewable petrol sources which need refining and energy input in order to get transformed into plastic material	N	Y		
Liquid Nitrogen supply	Manufacturing and distributing liquid nitrogen	water	X													N	Y		
CO2 supply	Bottling and distributing CO2		X		X											N	Y		
Product used by final consumer	Secondary packaging disposed by customer	waste									X					N			
	Primary packaging disposed by consumer	waste									X					N			
	Out-of- date product disposed by customer	waste									X					N			
	Product scraps disposed by consumer	waste									X					N			
Transport of waste by waste contractor	Air pollutants generated		X		X	X				X					Emissions, use of non renewable resources (fuel), noise, congestion, odours etc	N	Y		
Lanfill dsposal	Disposal of general waste to landfill	waste			X	X	X	X	X	X	X	X	X	X	disposal sites are a finite resource, and in addition the more difficult wastes may be restricted in where they can be disposed of. Once in a landfill site there may be problems of leachate, and the resulting contamination of land or water. Gases may also be released from landfill sites contributing to the Greenhouse Effect, as well as presenting problems with the potential for explosion, nuisance, odour etc.	N	Y		

			Impact																
Activities / Products / Services	Aspect	Category	Resource depletion	Ozone depletion	Global warming	Air pollution	Groundwater contamination	Water pollution	land contamination	Comunity impact	Waste management	Risk to human health	Risk to wildlife	Loss of habitat	Detail	Situation N:normal U:unusual E:emergency	Significant Impact if controlled by a Permit	Control Measures	Severity Rating
Rendering of blood	washing of receiving area	effluent						X					X		see above	N	Y		
	Disposal of ash	waste				X					X				Disposal from incineration can release toxins into the air and create ash that requires disposal in hazardous waste landfills	N	Y		
	Odours generated	odours								X					Offensive odors may be emitted into the environment. Such odours can negatively impact human health and quality of life	N	Y		
	Volatile organic compounds (VOCs) are the primary air pollutants emitted from rendering operations	air				X				X		X			In the presence of sunlight, VOCs can react with nitrogen oxides to create ground level ozone and photochemical smog, which can in turn contribute to pollution of the atmosphere. Some individual VOCs are believed to be a threat to human health. For example, benzene is classified as carcinogenic (cancer-causing) to humans and hexane as a cause of nervous s ystem disorders	N	Y		
Cat 2 Animal By-Products	Rendering, then tallow for boilers, meal for local cement works	ABP				X				X					(b) This category includes animal by-products presenting a risk related to animal diseases or a risk or residues of veterinary drugs. These materials may only be recycled (through rendering) for uses other than animal nutrition (ie: biogas, composting, oleo chemical products, etc.)	N	Y		
Cat 3 (Viscera, feet, hocks, neckskin)	Rendering/Petfood	ABP				X				X		X			This category includes by-products derived from healthy animals (i.e animals slaughtered for human consumption which passed the health inspection). Only by-products belonging to this category can be used as feed materials following appropriate rendering treatment. Impacts associated with rendering plants may include harmful Odours and air pollution Airborne emissions from rendering plants may cause a variety of health issues Harmful viruses and bacteria may not be fully eliminated in rendering and may be transmitted into the environment Waste generated from rendering plants if released into the environment can result in negative environmental impacts	N	Y		
Feathers (Cat3)	Landfill	waste									X				see above	N	Y		
Blood (Cat 3)	Rendering/Landfill	ABP									X				see above	N	Y		
Offals (liver, heart, necks, gizzards)	Pet food	ABP									X					N	Y		
Sludge	Land spreading	waste							X		X				(b) This category includes animal by-products presenting a risk related to animal diseases or a risk or residues of veterinary drugs. These materials may only be recycled (through rendering) for uses other than animal nutrition (ie: biogas, composting, chemical products, etc.)	N	Y		
Contractors	Not aware of waste segregation	Waste							X		X					U	Y		
	Pouring chemicals down the drain	Water					X	X	X							U	Y		

ACCIDENT MANAGEMENT PLAN

2.8.2 Environmental Risk Assessment

Table 2.8.4 provides an environmental risk assessment of the worst case accidents identified in the installation accident scenario assessments. There are a considerable number of safeguards against such events described in the comments / controls column.

The final column in Table 2.8.4 contains a comment on the further actions planned to reduce the risk. It should be noted that the initiator for the events has not necessarily been identified. For example, for a fire, the specific source of ignition has not always been considered, rather a general assessment of the likelihood of the event.

Table 2.8.1 Ranking matrix for risk assessment

"S" Severity of environmental impact			"L" Likelihood of event		
1.	Minor	Nuisance on site only (no off site effects)	1.	Extremely Unlikely	Incident occurs less than once in a million years.
2.	Noticeable	Noticeable nuisance offsite, e.g. discernible odours. Minor breach of Permitted emissions, but environmental harm. One or two complaints from the public.	2.	Very Unlikely	Incident occurs between once per million and once every 10,000 years.
3.	Significant	Severe and sustained nuisance, e.g. strong offensive odour or noise disturbance. Major breach of Permitted emissions with possibility of prosecution. Numerous public complaints.	3.	Unlikely	Incident occurs between once per 10,000 years and once every 100 years.
4.	Severe	Hospital treatment required. Public warning and off site emergency plan invoked. Hazardous substance releases into water course with ½ mile effect.	4.	Somewhat unlikely	Incident occurs between once per hundred and once every 10 years.

5.	Major	Evacuation of local populace. Temporary disabling and hospitalisation. Serious toxic effect on beneficial or protected species. Widespread by not persistent damage to land. Significant fish kill over 5 mile range.	5.	Fairly probable	Incident occurs between once per 10 years and once per year.
6.	Catastrophic	Major airborne release with serious offsite effects. Site shutdown. Serious contamination of groundwater or watercourse with extensive loss of aquatic life.	6.	Probable	Incident occurs at least once per year.

Tables 2.8.2 and 2.8.3 calibrate the calculated risk numerically and verbally.

Table 2.8.2 Calibration of risk assessment outputs 1 – banded

Likelihood of Event		**Severity of Environmental Impact**					
		Minor	Noticeable	Significant	Severe	Major	Catastrophic
		1	**2**	**3**	**4**	**5**	**6**
Extremely Unlikely	1	1	2	3	4	5	6
Very Unlikely	2	2	4	6	8	10	12
Unlikely	3	3	6	9	12		
Somewhat Unlikely	4	4	8	12			
Fairly Probably	5	5	10				
Probable	6	6	12				

Table 2.8.3 Calibration of risk assessment outputs 2 – descriptive

Risk Score	Magnitude of Risk	Consideration
6 or less	Insignificant	Low or negligible levels of risk, low or negligible impacts. Adherence to good operational practices will adequately control these risks.
8 – 12	Acceptable	Lower level of possible impact, but major severity or high likelihood would require consideration of further actions to reduce risk.
15 or more	Unacceptable	Combination of high likelihood or major impact would require further assessment and possible actions to reduce risk.

Review

Since the last review, there has been one addition to plant on site that has merited a change in this plan – the addition of the Chlorine dioxide injection/dosing system for incoming mains water.

TABLE 2.8.4

Environmental Consequences	Hazardous Event	Actions to Minimise / Prevent	S	L	R	Actions Planned/ Implemented
Contaminated run off to controlled waters/sewer/ ground	Spillage of hygiene chemicals during use in factory	Safety data sheets are held for all chemicals by Engineering Manager, Nurse and Hygiene Manager. Electronic version of the MSDS register is held on public file. Small quantities only are used within the factory. COSHH assessments complete. Ongoing review/process set up with Holchem, change in Personnel and Chemicals. Onsite Effluent treatment plant (ETP)	1	5	5	
Contaminated run off to controlled waters/sewer/ ground	Spillage due to incorrect storage of chemicals	Cleaning chemicals are pumped to dispensing points within the factory from 3 bunded storage tanks. There are separate bunded area for IBC's and 25L drums where chemicals are decanted into smaller containers. Within the chemical store provision is made for chemicals to be segregated into designated areas which are labelled to prevent the storage of incompatible chemicals next to each other. The bunded areas and all drains in decant and storage areas drain to ETP. Safe operating procedures are in place for storage of chemicals. Fill points relocated inside bund.	1	2	2	
Contaminated run off to controlled waters/sewer/ ground	Spillage of cleaning chemicals during transport.	All forklift truck drivers are trained. FL truck drivers would contact relevant people. Spill kits are provided at strategic locations to deal with spillages.	1	3	3	

Environmental Consequences	Hazardous Event	Actions to Minimise / Prevent	S	L	R	Actions Planned/ Implemented
Contaminated run off to controlled waters/sewer/ ground	Decanting of chemicals from bulk into 25 litre containers.	Decanted by trained hygiene staff only in designated area.	1	4	4	
Contaminated run off to controlled waters/sewer/ ground	Spillage of hydraulic oil and waste oil during storage, use, delivery and collection.	Waste oils from engineering and canteen are stored in a bunded container and are removed by licensed contractor. There is a locked container for storing all engineering oils. Engineering staff are trained on spillage procedures and use of spillage kits. All surface water drains go through to the ETP in Liarage. Oil should be emulsified in ETP if getting into foul drain. Forklift truck drivers are trained. Site emergency response plan held by security, which includes a copy of the site drainage plan. Spill kits provided at strategic locations. Fuel interceptors.	2	2	4	
Contaminated run off to controlled waters/sewer/ ground	Spillage of battery acid from fork lift trucks or battery charging area.	Battery acid charging areas would occur inside the factory. Spills would go in to the ETP. All fork lift truck maintenance is done by 3rd parties, FL truck drivers are trained on how to charge up their batteries. Purpose built External Battery charging facility	1	3	3	
Contaminated run off to controlled waters/sewer/ ground	Spillage of fuel oil during delivery	Delivery of oil by licensed contractor. Fill point outside the bund and near by drains are surface water. Procedure in place for Tank charging. Delivery supervised and local drains covered during tank charging.	5	2	10	
Contaminated run off to controlled waters/sewer/ ground	Spillage of fuel oil during storage.	Bund is > 110% and is in good condition. Visual inspections are carried out on the bund on a regular basis. Fill point relocated inside bund.	5	2	10	
Contaminated run off to controlled waters/sewer/ ground	Spillage of boiler house chemicals during storage and delivery.	One chemical used for boiler house treatment which is pumped over from a portafeed (an integral bunded container). Chemicals delivered by licensed contractor.	2	2	4	
Contaminated run off to controlled waters/sewer/ ground	ETP chemical storage.	Chemical Tanks are bunded. The building drains to ETP if spillage occurs. Tank fill-points have different size flanges to prevent filling with he wrong chemical and are indentified	2	2	4	
Contaminated run off to controlled waters/sewer/ ground	Condensing Towers	Legionella control chemicals and descaling chemicals are kept in the main plant room in a portafeed system. The chemicals are pumped as required. 3rd party contractors monitor.	3	2	6	
Contaminated run off to controlled	Spillage of blood from the tank during	High level alarms are installed which automatically cut-off when full. The tank is	3	2	6	

Environmental Consequences	Hazardous Event	Actions to Minimise / Prevent	S	L	R	Actions Planned/ Implemented
waters/sewer/ ground	storage (overfill)	emptied on a scheduled basis to prevent over-filling area drains to ETP. Tank contents light and high level alarm commissioned spill kits are provided.				
Contaminated run off to controlled waters/sewer/ ground	Spillage of red diesel during delivery.	Delivery of diesel by licensed contractor. Double skin tank installed. Procedures for supervised delivery in place. Spill kit in locations	2	2	4	
Contaminated run off to controlled waters/sewer/ ground	Spillage of red diesel during storage.	Both diesel fuel tanks integrally bunded.	2	3	6	
Contaminated run off to controlled waters/sewer/ ground	Spillage during storage of untreated effluent and sludge.	A 1m containment wall has been built around the ETP and all associated drains are routed back to internal drains or ETP. The area is hardstanding. The balancing tank has a high level alarm. If a problem, all effluent would drain back to the screening tank which when full would drain to sewer. The system has auto change over, high level alarm and creates DAF plant shut down.	4	2	8	
Contaminated run off to controlled waters/sewer/ ground	Spillage of sludge during removal by contractor.	Contractors tanker filling will be supervised and controlled by ETP operator.	4	2	8	
Contaminated run off to controlled waters/sewer/ ground	Spillage during oil removal from air compressors.	Oil recover unit in place.	2	2	4	
Contaminated run off to controlled waters/sewer/ ground	Food waste entering drainage system.	Catch pots in the factory drains which are emptied out by hygiene staff on a daily basis. All effluent goes through a 6mm screen before going in to the ETP.	1	2	2	
Contaminated run off to controlled waters/sewer/ ground	Blocked drains.	Drains in the factory are covered with a 6mm screen. There is a 0.75mm screen before the ETP.	2	2	4	
Contaminated run off to controlled waters/sewer/ ground	Leak from effluent drains.	Comprehensive CCTV drainage survey was undertaken in 2010 and 2016 as a result there was partial re-routing of drains.	3	3	9	
Contaminated run off to controlled waters/sewer/ ground	Failure to contain firewater	Vast majority of firewater from process areas would go to the sewer or ETP. Some buildings located next to surface water drains, i.e. offices. Storm drains could be plugged to contain excess run off. Emergency check valve.	2	3	6	
Contaminated run off to controlled	Vandalism/sabotage	Parameter fencing, 24 hour site security. Plant rooms are locked. Locked valves.	1	1	1	

Environmental Consequences	Hazardous Event	Actions to Minimise / Prevent	S	L	R	Actions Planned/ Implemented
waters/sewer/ ground		CCTV				
Contaminated run off to controlled waters/sewer/ ground	Spillage of ClO_2 generation chemicals	The chemicals used to generate ClO_2 on site (Sodium chlorate and Hydrochloric acid) are delivered via the Alchem Portafeed system. This includes the services of a trained Alchem delivery specialist who, in partnership with site personnel, oversee a safe delivery of chemical into the tanks which are contained within a locked enclosure. This is done using a lock out tag out process on remote delivery lines. Both chemicals are then pumped into separate, bunded tanks. Only half the capacity of the tanks is loaded at any time, and the two chemicals are never loaded together. A visual inspection of the tanks and bunds is carried out before and after delivery. The delivery is monitored by a 2SFG competent person.	3	3	9	
Air Pollution	Leak of ClO2 gas to atmosphere	The 'Bello Zon' ClO_2 generation unit is a hermetically sealed reaction chamber and the gas is stored for a short period of time (15-20 minutes) before it is injected into the sample stream and diluted in water to the set point.	3	3	9	
Air Pollution	Leak of Ammonia from refrigeration system	Regular maintenance and Monthly External Contractor – Brooktherm Refridgeration Ltd. Ammonia Detection in operation raising an alarm (2 stage) locally & in the Security House. Pipework upgraded 2016	4	3	12	
Air Pollution	Explosion following leak of liquid oxygen.	No naked flames allowed near the tank. Tank stored in a tank farm which fenced off and secure.	5	1	5	
Air Pollution	Explosion following leak of LPG.	Controlled and locked off storage area. Fork lift truck drivers trained on transferring over bottles.	1	1	1	
Air Pollution	Fire / explosion	Fire / explosion as a result of leakage of oxygen as it is transferred in pipework through the roof void. CO_2 and O_2 detectors in factory roof void. There is a warning alarm and high level alarm for O_2 (2 stage alarm).	4	1	4	
Air Pollution	Risk of legionella from water system.	Legionella control programme in place. This is managed by licensed contractors in line with L8 guidance.	6	1	6	
Air Pollution	Fire / explosion in central vacuum	A two stage high oxygen alarm is located in the central vacuum system. The 2nd stage	3	2	6	

Environmental Consequences	Hazardous Event	Actions to Minimise / Prevent	S	L	R	Actions Planned/ Implemented
	system following O_2 enrichment of the vac system.	shuts the whole process.				
Air Pollution	Major Electrical Power Failure – entire site - Entire site power failure would affect not only the abatement equipment but also the process which is the source of the odour	The process would cease; effluent, sludge & blood abatement would be immediately switched from the Scrubber to the back-up carbon absorption drum allowing for displaced air via expansion to be abated. Timely removal of ABP's from site. Remaining effluent waste streams and re circulation fluid could be transported by portable pump to the balance tank. Similarly for blood and sludge to their respective holding tanks. If the scenario were to last for more than 18 hours, dependent on the time & period of power outage, then fluids would be transferred, by gravity feed, to road tanker with displaced air abated through the carbon filter.	2	4	8	
Air Pollution	Localised Power failure to the DAF Plant / Threat to effluent plant from contamination of system or system failure.	The scenario would result in the 200m^3 underground tank (sump), 350 m^3 balance tank, the 48m^3 screening tank filling. These vessels have high level alarms. There is a dedicated plant operative. This area is a normally manned area Once all holding tanks were full, production would cease until the power was restored. Odour abatement would not be affected. Given that the DAF unit runs from the Site's Effluent Balance Tank, it is considered that there would be sufficient storage capacity in the Balance Tank to fix any electrical issue.	2	4	8	
Air Pollution	Blood Scrubber failure (power)	Scrubber Flow Sensor Alarm – in the event of Scrubber power failure, the alarm sends a signal to a local and remote visual/audible alarm unit in the Site Security Office (manned 24/7). This will initiate a response call to Site Engineering. Dedicated plant operative continually monitors all storage and abatement systems.	2	5	10	

Environmental Consequences	Hazardous Event	Actions to Minimise / Prevent	S	L	R	Actions Planned/ Implemented
Air Pollution	Parsons Scrubber failure (power)	Scrubber Flow Sensor Alarm – in the event of Scrubber power failure, the alarm sends a signal to a local and remote visual/audible alarm unit in the Site Security Office (manned 24/7). This will initiate a response call to Site Engineering. Dedicated plant operative continually monitors all storage and abatement systems.	2	5	10	
Air Pollution	Failure of the integrity of effluent, sludge, blood bulk storage vessels and associated pipework and valves etc	Dedicated plant operative. This area is a normally manned area. Any blood /sludge odour would be quickly noticed. The site is currently implementing EEMUA (Engineers Equipment and Materials Users Association) 159 – maintenance and inspection of above ground vertical steel cylindrical storage tanks. The stored inventory would be removed from site as soon as possible if the situation was not brought under control very quickly. A 1m containment wall has been built around the ETP and all associated rains are routed back to internal drains or ETP. The area is hardstanding. The balancing tank has a high level alarm. If a problem, all effluent would drain back to the screening tank which when full would drain to sewer. NDT testing of tank completed 2016.	3	4	12	
Air Pollution	Cat 2 and cat 3 not being removed from site and becoming putrid	The area is manned whilst ABP's are on site. Timely removal of ABP's from site.	3	4	12	