RISK & HAZARD MANAGEMENT

013 - Fugitive Emissions and Accident Management Plan

Saffil Ltd (also known as Unifrax/Alkegen) Line 4 Permit Variation

Document History

Version	Issue	Date	Notes	Author	Reviewer
1	-	23/03/22	Working draft with client	J. Carroll	
2	-	15/06/23	Revised draft	R. D'Souza	P. Williams

Contents

1 Introduction

Please note that this document refers to the site as Unifrax Widnes and to the owning company as Unifrax. Unifrax was the name of the American company that owns Widnes site. A further complexity is added because due to a recent merger, Unifrax has changed its name to Alkegen. So, it is possible in correspondence or discussions that the site may be referred to as Alkegen.

The legal entity that owns the site at Widnes is however called Saffil Ltd and remains so despite the name changes to Unifrax and Alkegen – and it is in this name that the EPR application is made on the accompanying forms.

This document provides a summary of the fugitive emissions predicted onsite, and the methods in place to control them.

In summary, there are no significant fugitive emissions to air, controlled waters or sewers from the site, nor is odour expected to be a significant issue.

An assessment of potential accidents and mitigating factors is also documented, together with a detailed accident management plan. This includes a summary report covering the impact and learning of a major fire, which destroyed the Line 3 production building in April 2017.

1.1 Fugitive emissions to air

Fugitive emissions to air are prevented/ minimised in a number of ways to ensure BAT is applied. All fugitive emissions from the process equipment are to the building enclosing the equipment, which is a working area. Fugitive emissions generally are tightly controlled to minimise personnel exposure under Control of Substances Hazardous to Health (COSHH) Regulations. The table below provides details of the techniques employed to minimise impact and apply to existing Lines 2 and 3 and the new Line 4.

Table 1 Control of fugitive emissions to air

Area	Activity	Fugitive emissions	Control measures
Solution Preparation	Transferring solids between vessels	Particulates	Enclosed conveying systems.
Solution Preparation	Offloading of PEO and ACH solid into hoppers	Particulates	Enclosed drum tipping stations. Remote operation. Personal protective equipment.
Spinning	Drying with primary and secondary air	Hydrochloric acid (HCl)	Spinning chamber pressure used to monitor chamber set up and minimise secondary air egress into working area. Use of chamber doors and

Area	Activity	Fugitive emissions	Control measures
			sheets to reduce aperture on chamber for secondary air to blow out. Prevention of product entrainment in secondary purge by filter screens in secondary air circulation loop. Regular monitoring of HCl levels and HCl leak sources linked to maintenance and refurbishment plan. Shutdown of the facility if satisfactory extraction cannot be achieved or if local HCl levels in the air are outside specified parameters. Shift supervision team have autonomy in deciding to shut down in this case. Personal protective equipment.
Heat Treatment	Decomposition Oven (also known as steaming oven)	HCl, Volatile Organic Compounds (VOC), Dioxins and furans.	To ensure effective capture: Extraction hood design and check of face velocities. Monitor steam flow against vent flow, optimise operating temperatures to ensure removal of organics from fibre. Adjustable height of baffles between zones to reduce gas migration between zones. Regular maintenance and cleaning of extraction ducting directed to downstream abatement, to prevent leaks and blockages. Replacement of ducting on scheduled overhauls if necessary. Double air purged seals on recirculation fans. Regular monitoring of HCl levels and HCl leak sources linked to maintenance and refurbishment plan. Shutdown of the facility if satisfactory extraction cannot be achieved or if local HCl levels in the air are outside specified parameters. Shift supervision team have autonomy in deciding

Area	Activity	Fugitive emissions	Control measures
			to shut down in this case.
Heat Treatment	LT Furnace	HCl, VOC, Nitrogen Oxides (NOx), Dioxins and furans and combustion gases	Balance of purge air input versus vent output to ensure escape to scrubber extraction hoods is minimised and VOCs are fed to VOC treatment.
Heat Treatment	HT Furnace	Particulates	Ensure good extraction hood design to capture all dust from conveyor. Clean during scheduled overhauls.
Heat Treatment	General	HCl	Daily and weekly monitoring of background HCl levels, and specific sources of fugitive HCl emission is completed linked to reactive and planned maintenance work.

There have been no complaints about site odour in the past and it is believed that the uprated operations, once Line 4 is commissioned, will give no reasonable cause for offence or annoyance with regard to odour.

1.2 Dust and Particulate (PM_{10}) Management Plan

1.2.1 Responsibility for Implementation of the DEMP

The aim of the DMP is to:

a) Minimise dust generation and migration from the site;

b) Ensure dust pollution at local sensitive receptors is minimal;

c) Establish a dust minimisation strategy which shall be implemented on site;

d) Ensure the operations on site consider the potential dust generation.

The DMP is the responsibility of the EHS manager, in their absence, this responsibility will fall to the production manager.

The DMP should be reviewed annually as part of the Site Management Review.

All relevant operational staff will be suitably trained to ensure they understand the purpose of this DMP and understand what actions need to be taken in event of a complaint. Training will be taken by the EHS manager.

1.2.2 Site Description

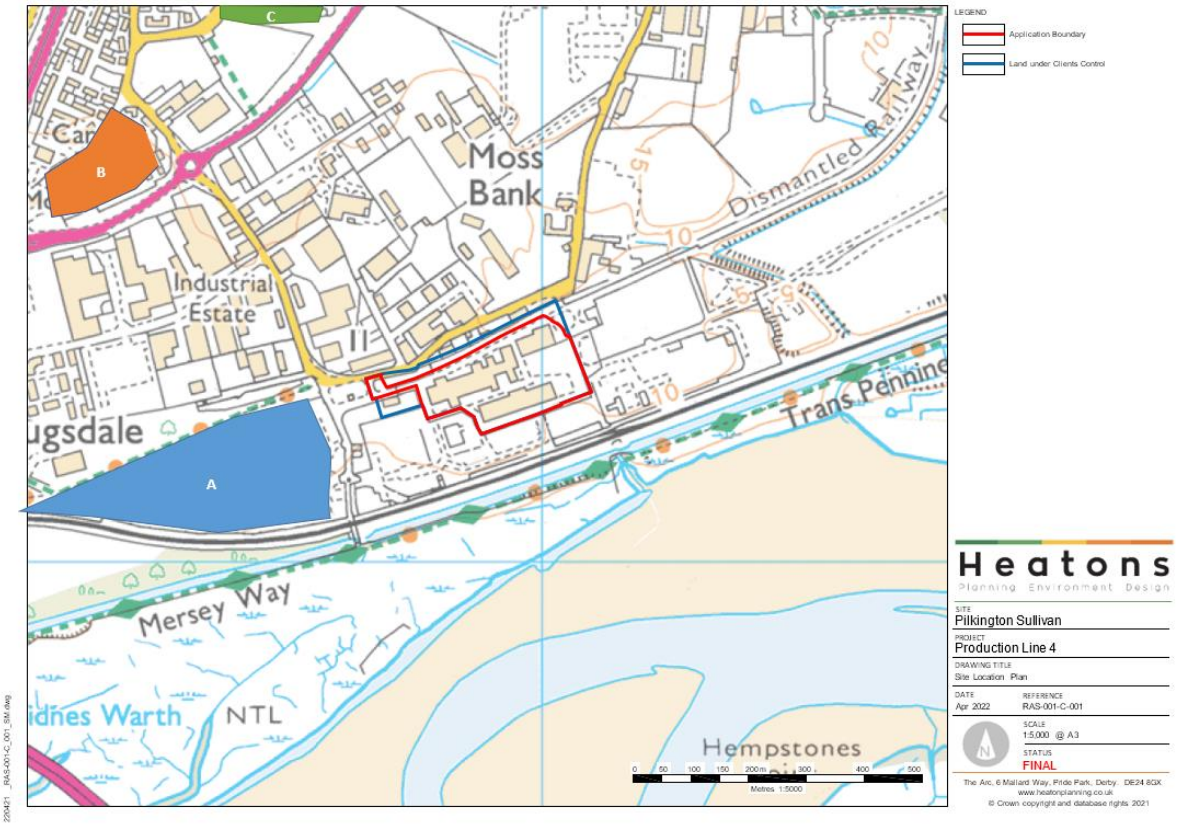
The Saffil facility manufactures high-temperature fibres designed for a variety of industrial and commercial applications.

The Saffil facility is located in an industrial/commercial area.

Sensitive receptor locations are those where the public may be exposed to dust potentially arising from the site. The most sensitive receptor locations with respect to dust are residential dwellings where people generally expect a high level of amenity, there is some distance between the site and the nearest residential Sensitive Receptors. The nearest sensitive receptors are considered to be:

Receptor reference	Land use	Direction from site	Approximate distance to the site boundary
A	Residential - new development	West	240m
B	Residential - River View Residential Caravan Park	Northwest	630m
C	Residential - houses in French Street	North Northwest	750m

See map below for site location and receptors.



1.2.3 Sources and Control of Fugitive Dust/Particulate Emissions

The main sources of dust identified are:

- Vehicles entering and/or leaving the site with mud on wheels, and tracking dust on to or off the site.
- Vehicles and plant moving around the site kicking up dust.
- Dust from raw materials as it is being fed into the process.
- Dust from raw materials as it is transported and consumed in the preparation of solutions.
- Breakage of processed product due to abrasion from transport/handling fibre.
- Waste product due to process failures, e.g. removal of flared material.
- Site surfaces (not just the ground include around plant and equipment).
- Particulate emissions from the exhaust of plant/machinery on site.

1.2.4 Source-Pathway-Receptor Routes

Source	Pathway	Receptor	Type of impact	Where relationship can be interrupted
Vehicle exhaust emissions	Atmospheric dispersion.	Receptor A- new residential development.	Airborne particulates.	Regulatory controls and best-practice measures to minimise source strength.
Non-road going machinery exhaust emissions	Atmospheric dispersion.	Receptor A- new residential development.	Airborne particulates.	Regulatory controls and best-practice measures to minimise source strength.
Vehicles and plant moving around the site kicking up dust.	Atmospheric dispersion.	Receptor A- new residential development.	Airborne particulates.	Vehicles restricted to tarmac surfaced roadways. Roadways cleaned with road sweeper fortnightly.
Dust from raw materials as it is being fed into the process.	Atmospheric dispersion.	Receptor A- new residential development.	Airborne particulates.	Enclosed drum tipping stations. Secure packaging used up until point of use.
Dust from raw materials as it is transported and consumed in the preparation of solutions.	Atmospheric dispersion.	Receptor A- new residential development.	Airborne particulates.	Enclosed conveying systems. Regular maintenance inspections and replacement of guarding/seals as appropriate.
Breakage of processed product due to abrasion from transport/handling fibre.	Escape from buildings and subsequent atmospheric dispersion.	Receptor A- new residential development.	Airborne particulates.	Static dust extraction used at areas of highest dust generation, e.g. reeling, finished product inspection, etc.
Waste product due to process failures, e.g. removal of flared material.	Atmospheric dispersion.	Receptor A- new residential development.	Visual soiling and airborne particulates.	Minimise waste production through the Operations Management System. All material bagged before leaving building. Waste material stored in high sided skip to minimise wind exposure.

Site surfaces including around plant and equipment.	Atmospheric dispersion.	Receptor A- new residential development.	Visual soiling and airborne particulates.	Vacuuming according to cleaning routines. Roadsweeper used for internal walkways.
Particulate emissions from the exhaust of plant/machinery on site.	Atmospheric dispersion.	Receptor A- new residential development.	Airborne particulates.	Regulatory controls and best-practice measures to minimise source strength.

1.2.5 Measures that will be used on site to control dust/particulates (PM_{10}) and other emissions

Abatement Measure	Description / Effect	Overall consideration and implementation	Trigger for implementation
Preventative Measures			
Enclosure within a building	Fibre production is carried out within a physical building, creating a solid barrier between the source of dust and particulates and receptors. Major entrances and exits are fast action doors. Raw materials storage and handling takes place inside buildings to minimise dust emission.	Regular inspection of the fabric of the building is carried out to ensure it is in good condition. Regular GEMBA walks are carried out by site management to check conditions.	All production activities take place in the building by design.
Dust Extraction Systems	Each line is equipped with a wet scrubber for high temperature processes to capture dust from waste exhausts.	Very effective despite costs and potential disruption to already operational sites. Operational costs may be prohibitive. Should be identified clearly in the site management system and implemented as appropriate measures.	The wet scrubber and baghouse are run constantly during production and written into the plant start-up procedures. During regular scheduled maintenance periods, both pieces of equipment are inspected and maintained as necessary.

Abatement Measure	Description / Effect	Overall consideration and implementation	Trigger for implementation
	Each line has a baghouse for packaging processes to capture dust at the point of generation.		
Site speed limit, 'no idling' policy and minimisation of vehicle movements on site	A speed limit of 10mph for HGVs and 5mph for mobile plant is enforced to reduce re-suspension of particulates by vehicle wheels. A one-way system is enforced to allow smooth traffic movement, reducing vehicle movements and idling should reduce emissions from vehicles.	Easy to implement as part of good practice. Should be identified clearly in the site management system and implemented as appropriate measures.	This procedure is always in effect and the speed limit is enforced with internal and external drivers.
Good house-keeping	The plant is divided into areas and housekeeping inspected daily, to be reported on during the daily operations review. Remedial actions are communicated out for tackling within the next 24 hours. Regular GEMBA walks are carried out by site management to check housekeeping standards are being adhered to. Internal areas and roadways are cleaned using a road sweeper.	OSLs/Team Leaders carry out inspection of designated areas every shift. Feedback on the inspected areas is delivered to the site's operations team during the daily operations review. Remedial actions to be completed within the next 24 hours are issued to internal personnel or contractors, as necessary.	Housekeeping is reported on daily and housekeeping forms part of the regular daily activities. The road sweeper is used twice a month to control dust levels.
Easy to clean concrete	All internal flooring is concrete, with painted areas to designate walkways.	Regular GEMBA walks are carried out by site management to check conditions.	The floor has been concrete since the buildings were originally built. The roadways are all

Abatement Measure	Description / Effect	Overall consideration and implementation	Trigger for implementation
impermeable surfaces	Internal areas and roadways are cleaned using a road sweeper.		tarmac. No regular activities take place on unsurfaced ground.
Minimisation of waste storage heights and volumes on site	Waste fibre is bagged to prevent airborne dispersion. The bagged fibre is placed into an enclosed compactor skip to prevent dispersion.	The compactor area is inspected daily to replace the skip as soon as it is filled. Regular GEMBA walks are carried out by site management to check conditions.	Waste fibre is only created as a result of a production failure, so we monitor Quality Yield as part of our plant KPIs and use Quick Kaizens to tackle defects.
Remedial Measures			
On-site sweeping	Vacuuming of internal areas is carried out regularly to manage larger debris, dust and particulates without causing the mobilisation of smaller particles. A road sweeping vehicle is used to damp down dust and particulates whilst brushing and collecting dust and particulates from the road surface, particularly at the kerbside.	The road sweeper is contracted, so all staff using it are trained on it's safe use and maintenance procedures.	Vacuuming is carried out daily on a rolling basis between areas of concern highlighted during GEMBA walks. The road sweeper is used twice a month to control dust levels.

1.2.6 Other considerations

Water usage/ availability:

If we lacked sufficient water to be able to operate the wet scrubber at a safe working temperature e.g. due to a drought, we would not be able to operate the plant due to interlocks caused by multiple critical alarms on the scrubber system.

1.2.7 Enclosure of Waste Processing & Storage Areas

Waste fibre is bagged while inside the building to prevent airborne dispersion.

The bagged fibre is placed into an enclosed compactor skip to minimise dispersion. The compactor area is inspected daily to replace the skip as soon as it is filled.

Regular GEMBA walks are carried out by site management to check conditions. Waste fibre is only created as a result of a production failure, so we monitor Quality Yield as part of our plant KPIs and use Quick Kaizens led by the Quality Improvement Manager to tackle defects.

1.2.8 Visual Dust Monitoring

The main areas on site for the generation of dust are from vehicle movements on the roadways and internally generated dust from the fibre production. Both internal areas and roadways are cleaned using a road sweeper to control dust levels. As the main potential source of dust are internal, we monitor dust levels inside the plant to reduce the risk of dust leaving site. If we were to anticipate an increase in deliveries or receive a complaint we would increase the frequency of road sweeping in the first instance.

The plant is divided into areas and housekeeping inspected daily, to be reported on during the daily operations review. A board is used to keep a rolling weekly visual indicator of area cleanliness. Remedial actions are communicated out for tackling within the next 24 hours.

Regular GEMBA walks are carried out by site management to check housekeeping standards are being adhered to, including the generation and presence of dust. GEMBA walks are recorded using an online form and the data outputted to a database for review by the EHS Manager.

Regular measurement is carried out of Total Particulate Matter from the baghouse filter stack emissions according to SRM - BS EN 13284-1. This measurement is carried out regularly in line with our permit and included in our submissions, as detailed previously.

Uncontrolled dust releases could potentially occur as the result of a failure of the abatement or extraction systems. These releases would be detected in the first instance automatically by pressure drops in the relevant systems, if not, then by the daily housekeeping inspection and then finally during the GEMBA walks. Depending on the nature of the failure this would either cause an automatic shutdown or require a manual shutdown until containment can be implemented.

1.3 Fugitive emissions to surface water, sewer and groundwater

Fugitive emissions to surface water, sewer and groundwater are prevented/minimised as detailed in the table below.

Table 2 Control of fugitive emissions to air

Area	Activity	Fugitive emissions	Control measures
Raw Materials Import	Road Tanker Offloading	Liquid spills Caustic, alumina solution, silica sol	Drain capping, kerbed area, Segregation from surface water, and breakaway couplings on fill-lines inside bunds. Spillage kits available.
Raw Materials Import	Road Tanker Offloading	Diesel oil (1)	Drain capping, kerbed area, Segregation from surface water, Spillage kits available.
Raw Materials Storage	Solid storage and handling	Bag splitting/ Solids handling	Dust contained by dedicated handling system. Spillages on ground are immediately cleaned up. Civil inspection regime.
Raw Materials Storage	Drums and IBC's	Liquid spills	Dedicated storage area, bunded, ensure drums stacked safely.
Raw Materials Storage	Liquid storage & handling	Liquid spills	Regular vessel inspections. Bunded area.
Solution Preparation	Storage Tanks and mixer vessels	Liquid spills, Alumina and silica solutions.	Overflows on tanks into bunded area, high level alarms and trips
Solution Preparation	Transferring liquids between vessels	Liquid Leaks: Alumina and silica solutions.	Lobe pumps : one pump on each duty has water-flushed seals, one has packed glands. Cap and plug open ends

1.3.1 Assessment of bunds/surface conditions

A full assessment of the condition and design of bunds, and ground surfaces can be found in the Site Report that accompanies this EPR application.

1.3.2 Total emissions attributable to fugitive releases to water, sewer or groundwater

The proportion of total emissions that are attributable to fugitive release to water, sewer or groundwater is estimated to be much less than 1% of total emissions.

2 Accident/Incident scenarios

Potential accident scenarios that may lead to increased emissions have been assessed in the table below in order to produce an accident management plan.

The scoring of severity and likelihood has been carried out in a fashion similar to Environment Agency Guidance H1 Annex A and C (although this is no longer current but a useful framework in which to complete the assessment).

Firstly, a description of the 2017 major fire incident at the site is covered below.

A major fire occurred on the Widnes site on 20 April 2017, which destroyed the Line 3 Production Building and some of the equipment and chemical containment inside the building. The external equipment, including the main VOC/dioxin and particulate abatement plants and raw materials bulk storage tanks, was not seriously damaged.

The cause of the fire was hot fibre not being adequately cooled before packing into cardboard boxes. This resulted in a packaging fire which rapidly spread to adjacent finished product stored in racks in cardboard boxes. This in turn ignited the glass reinforced plastic (GRP) cladding on the sides of the building and roof, resulting in a total loss of the building.

The loss of material to the environment and measures taken to contain and recover spilled material are summarised below.

To air:

A substantial plume of black smoke was generated by the fire - principally due to the combustion of the GRP building cladding and packaging materials (paper, cardboard, pallets, plastic bags). A small amount of organic raw material (polyethylene oxide) was also burned in the fire. Saffil fibre does not burn, although associated packaging was burned. Some glass fibre and Saffil fibre were lost to air during the clean up operation inside the wrecked building.

To water/sewer:

It is thought that there was no significant loss of chemicals to water or sewer as a result of the incident. Bulk inventories of raw materials remained contained in their storage tanks. A number of IBCs containing waste spinning solution melted during the fire and the material inside was lost to hard standing, but this is thought to have been successfully contained local to the building, without entering the site drainage system. The fire was left to go through a 'controlled burn', with firewater being used only to protect the assets outside the fire area, minimising the amount of contaminated runoff. Some melted raw materials (polyethylene oxide containing ACH flake) were contained local to the building and are not thought to have entered the drains.

To land:

As mentioned above, there was some loss of chemicals to hard standing local to the building. A small amount of spinning solution (thought to be less than 1000 kg) was lost to the neighbour's land outside the site boundary fence. A characteristic of spinning solution is that it crystallises and solidifies, which made recovery possible both on and off site, without significant material having entered the ground. Glass fibre fragments from the building were lost to the site and adjacent land and were cleaned up as practical.

Site containment and clean up was completed using competent contractors - ensuring that recovered materials and washings were contained and disposed of correctly. This included the removal of soil surface, contaminated concrete and a dig out of soakaway drains.

Clean up procedures were agreed with the local EA inspector and regular updates were sent. The local EA inspector visited the site a number of times to check on progress and advise.

Principal actions taken:

1. Line 3 Production Building replaced in non-flammable Kingspan laminated cladding.
2. Site fire suppression sprinkler system installed and rolled out to cover Line 3 building.
3. Flammable packaging quantities minimised in production areas – including no racked storage.
4. Packaged raw materials and IBC storage minimised in production areas.
5. Changes to product packing procedures.
6. Emergency procedures reviewed and improvements made to arrangements for fire response.

In summary this major incident did not result in a major loss of containment, although it did highlight deficiencies in site design and operations which have been addressed to reduce risk of a similar incident in future.

2.1 Identification and evaluation

Accident or abnormal release scenario	What are the Consequences of occurrence?	Severity Score 1-6	Actions taken or proposed to minimise the chances of it happening	Likelihood Score 1-6	Magnitude of Risk 1-36	Actions planned if the event does occur
Major Fire	Loss of containment of stored materials to sewer, controlled waters or to	6	Site fire suppression sprinkler system. Non flammable building	2	12	Fire management and emergency procedures. Operational measures and equipment

Accident or abnormal release scenario	What are the Consequences of occurrence?	Severity Score 1-6	Actions taken or proposed to minimise the chances of it happening	Likelihood Score 1-6	Magnitude of Risk 1-36	Actions planned if the event does occur
	air as combustion products. See summary report above.		materials. Reduced storage of packaging and finished product in production areas. Packing procedures.			installation to reduce risk. Operation of site fire suppression sprinkler system
Vessel failure	Material to bund	3	Scheduled vessel inspection and maintenance	3	9	Emergency Procedures and Spillage Containment Procedure
Overfilling of vessels	Material to bund	1	Hi and Hi Hi alarms/trips	5	5	Emergency Procedures and Spillage Containment Procedure
Major spillage during offloading of liquid raw materials or Diesel	Material to hardstanding and possibly road drains	4	Training and procedures. Supervised offloading. Breakaway couplings on caustic soda. High level trips and alarms.	3	12	Emergency Procedures and Spillage Containment Procedure
Breakdown of abatement plant-scrubber	HCl to atmosphere	2	Multiple alarms and trips	4	8	Plant shut down or online remedial measures
Breakdown of abatement plant-Oxidiser,	VOC/dioxin to atmosphere	2	Multiple alarms and trips. Plc/DCS control and alarms.	4	8	Plant shut down or online remedial measures
Breakdown of abatement plant-Effluent	Acid or excess alkali to drain	3	Multiple alarms and trips	4	12	Plant shut down or online remedial measures

Accident or abnormal release scenario	What are the Consequences of occurrence?	Severity Score 1-6	Actions taken or proposed to minimise the chances of it happening	Likelihood Score 1-6	Magnitude of Risk 1-36	Actions planned if the event does occur
neutralisation						
Failure of containment such as bunds	Aluminium chlorohydrate or caustic soda to roadway drains and Mersey estuary	3	Routine inspection and maintenance	2	6	Emergency Procedures and Spillage Containment Procedure
Emission of an effluent before adequate checking of its composition has taken place	Acid or excess alkali to sewer	2	Training and procedures Superivision.	5	10	Inform UU and EA. Investigate incident.
Damage to tanks caused by vandalism or vehicle collision.	Aluminium chlorohydrate or caustic soda to roadway drains and Mersey estuary	3	Barriers and tank locations. Site security Routine inspection Bunded tanks	2	6	Emergency Procedures and Spillage Containment Procedure
Damage to tanks caused by vandalism	Diesel fuel to roadway drains and Mersey estuary	4	Site security Routine inspection Bunded tank	3	12	Emergency Procedures and Spillage Containment Procedure

2.1.1 Inherent safety

The fibre manufacturing process does not use any substances that are classed as dangerous to the environment (CLP risk phrases H400, H410 or H411) other than diesel fuel. Small quantities of biocides are used to control biological processes in the cooling tower circulation. Polyethylene oxide is classed as an explosive dust and suitable measures are taken in storage and use of the product to minimise risk. None of the other process raw materials, intermediates or the product are classed as flammable nor are they capable of supporting combustion. Some packaging materials are combustible and the amount stored in process areas is minimised. A fire protection sprinkler system covers large areas

of the site and will be extended to cover Line 4. Small amounts of oil-based lubricants are used in site mechanical equipment maintenance. These conditions are considered to ensure that the process accident risk is inherently as low as reasonably practicable (ALARP) from causing accidental damage to the environment.

2.1.2 Prevention

The substances that could cause damage to the environment if spilled in large quantity, (sodium hydroxide solution, aluminium chlorohydrate solution, diesel), are handled over hard standing and loaded from transport via dry break couplings to bunded storage. There are written procedures for all handling of process liquids.

Procedures are in place to clean up any spillage inside and outside bunded areas. Spillage of liquids in bunded areas are neutralised before release to sewer or pumped into a road barrel for disposal via an authorised waste contractor.

Spillage of solid materials in process areas and raw materials warehouse are recovered for re-use or disposal off-site as appropriate.

A 2000 litre diesel tank is used to fuel fork lift trucks, this is located outside and protected with barriers, and is self bunded. A 10000 litre diesel tank is used to supply emergency back up fuel to the dual fuel boiler. This is also located outside and is self bunded.

Adequate storage arrangements for raw materials, products and wastes is provided with appropriate containment provided in the form of bunds and catchpots or general building containment.

Techniques (such as high level trips) and procedures are in place to prevent overfilling of storage tanks.

Security arrangements are in place to prevent unauthorised access to the site.

Procedures are in place to avoid incidents occurring as a result of poor communication among operations staff during shift changes and maintenance or other engineering work, such as a comprehensive permit to work system.

There are spillage containment procedures and equipment to minimise the risk of accidental emission of raw materials, products and waste materials and to prevent their entry into water.

The installation keeps a record of incidents, accidents and near misses. These are investigated to ensure that the learning is taken to prevent similar future incidents.

A site quality management system is in place which is accredited to ISO9001:2015, a global automotive quality standard. This ensures that operating procedures are in place and audited for all critical operations on the site.

The site has been regulated by an environmental permit since 1995. This ensures that the environmental management requirements are well understood by management and operating personnel.

2.1.3 Control

There are written procedures covering the offloading and handling of raw materials on the site.

Areas where spillage could take place are covered by hard standing. When road vehicles are unloaded, the adjacent drain grids are covered by drain covers.

A spillage containment and control procedure is in place together with a site emergency procedure.

IBCs containing raw materials or liquid materials for re-use or disposal are kept on areas of hard standing with appropriate bunding arrangement.

2.1.4 Mitigation

Procedures are in place to ensure that the composition of the contents of a bund sump, or sump connected to a drainage system, are checked before treatment or disposal.

3 Appendices

3.1 Appendix 1 - Accident and Fugitive Emissions Management Tables

Accident Plan for Releases from Fibre Production

What do you do that can harm and what could be harmed			Managing the risk		Assessing the risk	
Hazard	Receptor	Pathway	Risk management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
To Air						
Saffil dust	People, property, flora and fauna off-site from dust and fume release. Staff on site	Dispersion in the atmosphere	Saffil fibre production is in enclosed within buildings. Continuous dust extraction and abatement equipment to minimise accumulation of dust. Cleaning regime daily and during plant shutdowns.	Potential for wind blown dust to leave site. Extremely remote due to prevention and control measures following a previous incident.	Nuisance – dust on cars and on ground.	Not significant
Spillage of raw material or spinning solution	People, property, flora and fauna off-site from fume release. Staff on site	Dispersion in the atmosphere	None of Saffil fibre raw materials are volatile, combustible or toxic.	None off site. Corrosive risk from caustic on site.	Negligible off site. Possible lost time injury on site due to contact with caustic soda.	Not significant
Unabated VOC/Dioxin Emission	People, property, flora and fauna off-site from fume release. Staff on site	Dispersion in the atmosphere	Operational and maintenance measures on abatement equipment to avoid substantial operation when oxidiser is in bypass. Improved hardware on Line 3 and 4 oxidisers (eg burner redundancy, improved valve standard).	Minimal off site sensitive human receptors – additional impact insignificant vs current background levels.	Possible small increase in inhaled dosage	Dispersion modelling of the unabated emission shows insignificant impact
Fire - Packaging materials	People off-site from smoke release. Staff on site	Dispersion in the atmosphere	Site fire suppression sprinkler system. Improved packing procedures. Reduced storage of finished goods in production areas. Storage of packaging materials and raw materials minimised in production areas. Control of ignition sources safe systems. Provision of fire extinguishers and training in their operation.	Extremely remote, smoke plume from large fires are buoyant	Inhalation of pollutants – but very low frequency event	Low

What do you do that can harm and what could be harmed			Managing the risk		Assessing the risk	
Hazard	Receptor	Pathway	Risk management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			Smoke detection in amenity areas.			
Fire/explosion - Natural gas release from thermal oxidiser supply	Staff on site	Thermal radiation	Control of ignition sources safe system. Outside – well ventilated. Thermal radiation event unlikely and gas inventory in pipe small. Appropriate design standards. Inspection and maintenance procedures. Gas supply pressure is low and pipe sizes small giving limited hazard range. Remote emergency isolation valves.	Extremely remote	Inhalation of pollutants – but very low frequency event	Low
To water						
Fire water run off	Controlled waters	Drainage system	No collection other than existing bunds and hard standings currently in place. Fire risk assessments are in place and suitable equipment available to stop minor fires increasing in severity. No shrink wrap used (stretch wrap only), housekeeping measures in place to avoid packaging coming into contact with hot surfaces and inventory of packaging materials within the main production building kept low. Hot work is controlled under a specialist permit to work. Flammability of fibre and raw materials zero. Solution preparation and main production buildings have no drainage outlet to controlled waters and would contain significant quantities of fire water.	Unlikely	Polluted fire water run off to controlled waters	Low
Failure of pH control equipment – low pH effluent to sewer	Industrial sewer	Drainage system	Continuously controlled/monitored and alarmed to plant control room	Possible short duration loss of control	Low impact in sewer system	Low

What do you do that can harm and what could be harmed			Managing the risk		Assessing the risk	
Hazard	Receptor	Pathway	Risk management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Failure of pH control equipment – high pH effluent to sewer	Industrial sewer	Drainage system	Continuously controlled/monitored and alarmed to plant control room	Possible short duration loss of control	Low impact in sewer system	Low
Spillage of cooling tower dosing chemicals	Controlled waters	Drainage system	Self bunded chemical storage contained within hard standing. Weekly inspection.	Low	Minor pollution to controlled waters	Not significant
Overdosing of cooling tower water with dosing chemicals	Controlled waters	Drainage system	Dosing on a timer. Fail to danger ie continuous dosing not considered a viable failure scenario by the equipment supplier. Weekly inspection.	Low	Minor pollution to controlled waters	Not significant
Saffil liquid raw material or spinning solution spillage	Controlled waters	From hard standing to site drains and on to off-site drains	Siloxane – drummed material does not flow readily. Handled over hard standing. Stock tank bunded. ACH liquor - Tanks have low bunds sufficient to collect minor releases. Delivery points are within the bund. Delivery points have dry break couplings to minimise releases. Tanks are subject to regular inspection, materials of construction suitable and long lived. High level trip linked to offloading point. Supervised offloading. Overflows from tanks commoned between tanks (ie all three tanks have to be full before one overflows. Tanks protected from vehicular collision by location and Armco barriers. Deployment of drain covers. Spinning solution – tanks are subject to regular inspection, materials of construction suitable and long lived. All tanks inside on hard standing suitably bunded to contain failure of one or more tanks. IBCs handled	Possible minor spillages during offloading. Material contained and cleaned up. Probability of major loss - LOW	None of Saffil raw materials or intermediates are classified as dangerous to the environment	Low

What do you do that can harm and what could be harmed			Managing the risk		Assessing the risk	
Hazard	Receptor	Pathway	Risk management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			over hard standing and decontaminated in designated area. Caustic Soda - Tanks have 110% bund. Delivery points are within the bund. Delivery points have dry break couplings to minimise releases. Tanks are subject to regular inspection, materials of construction suitable and long lived. High level trip linked to offloading point. Supervised offloading. Overflows from tanks to bunds. Tanks protected from vehicular collision by location and Armco barriers. Deployment of drain covers. Silica solution – measures as above. Very low pollution hazard due to nature of material. Spillage containment procedure and associated equipment in place.			
Failure of containment (eg bunds)	Controlled waters	On site drains and on to offsite drains	Regular inspections of hard standings and bunds.	Minor emissions possible from eg cracked containment area Probability of major loss - LOW	None of Saffil raw materials or intermediates are classified as dangerous to the environment	Low
To land						
Chemical spillage	Ground on site	Direct	All areas where chemicals are handled are hard standing. Spillage control procedure and equipment in place. Controls as detailed above for raw materials. Decontamination carried out in dedicated bay.	Low due to prevention and control measures.	Ground contamination which could be contained and removed as necessary	Low

Accident plan for Releases from Boiler operation

What do you do that can harm and what could be harmed			Managing the risk		Assessing the risk	
Hazard	Receptor	Pathway	Risk management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
To Air						
Ignited diesel release	People and equipment on site.	Direct	Appropriate design standards. Inspection and maintenance procedures. Oil shutdown valves. Boiler building ventilated to prevent build up of flammables. Inventory of diesel low in boiler feed circuit.	Low	Death or hospitalisation of one or more Saffil Staff	Low
Ignited gas release	People and equipment on site.	Direct	Appropriate design standards. Inspection and maintenance procedures. Gas shutdown valves. Boiler building ventilated to prevent gas accumulation.	Extremely remote	Death or hospitalisation of one or more Saffil Staff	Low
To water						
Spillage of boiler dosing chemicals	Controlled waters	Drainage system	Self bunded chemical storage contained within bunded building. Weekly inspection.	Low	Minor pollution to controlled waters	Not significant
Diesel spillage	River Mersey	Saffil drains discharge to the Mersey via historic Pilkington Sullivan Site drains	Diesel tank self bunded to 110%. Off-loading area is hard standing. Hi hi alarms in place. Frequency of diesel offloading very low due to installation of gas fired boilers. Use of spillage containment equipment.	Unlikely	Diesel oil release to stormwater drains	Low – very low frequency operation
To land						
Diesel spillage	Ground within Pilkington Sullivan site	Direct over the edge of hard standing	Use of spillage containment equipment.	Unlikely	Diesel released to soil. Soil clean up.	Medium

Fugitive emissions management plan for Releases from fibre production

What do you do that can harm and what could be harmed			Managing the risk		Assessing the risk	
Hazard	Receptor	Pathway	Risk management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
To Air						
Saffil dust	People, property, flora and fauna off-site from dust and fume release. Staff on site	Dispersion in the atmosphere during handling of waste or finished product.	Saffil production is in enclosed within buildings. There is continuous dust extraction to minimise accumulation of dust. Cleaning regime in place daily and during shutdowns. Dust extraction and collection in place at key release points. Waste fibre from the line bagged immediately. Personal monitoring of plant and maintenance for dust exposure completed. Personal protective equipment used as necessary including the use of dust masks and suits.	Potential for wind blown dust to leave site unlikely due to prevention and control measures in place.. Contact of plant personnel with dust/fibre is likely but controlled.	Nuisance – dust/fibre in local environment. Fibre is inert and has minimal environmental consequence Measures taken reduce risk to below a level that would cause harm	Low providing measures maintained
VOC/HCl/Dioxin fume	Staff on site	Dispersion in the atmosphere due to leakage from equipment	Daily checks on HCl levels in the factory at designated points and control measures taken if control limit exceeded including shutdown of the plant as necessary. Preventative maintenance on equipment (eg fan seals) to reduce likelihood of emission. Inspection of ovens and kilns at every scheduled overhaul to ensure no corrosion damage that may cause leaks. Scheduled cleaning and inspection of extraction hoods. Background surveys of VOC and dioxin levels have been completed in 2008 to demonstrate	Contact with low levels of these pollutants is likely during operation of the plant	Measures taken plus assessment of levels reduce risk to below a level that would cause harm	Low providing measures maintained

			that background levels in the factory will not cause harm. Use of personal protective equipment as necessary including cartridge masks suitable to guard against VOC and HCl exposure.			
Raw materials (polyox, ACH flake) dust	Staff on site	Dispersion in atmosphere during handling activities	Use of dust extraction equipment and personal protective equipment. Housekeeping and cleanliness routines.	Contact with dust from these materials is likely but controlled.	Measures taken reduce risk to below a level that would cause harm	Low providing measures maintained
To water						
Spillage of liquid (ACH, caustic soda)	Controlled waters	Site drainage system	Drains are capped during offloading. High level trips and alarms. Bunding of tanks to 110%. Breakaway couplings. Overflow protection. Minor spills contained and cleaned up. Spillage containment equipment available. Pumps and pipework within bunded areas or bunded buildings.	Tanker offloading is most likely cause of spillage	Release of caustic soda or ACH to controlled waters. Some short term damage.	Low providing measures maintained
Spillage of liquid (siloxane or silica sol)	Controlled waters	Site drainage system	Drums/IBCs handled over hard standing or inside bunded building. Material very viscous and easily contained and disposed of. Siloxane tank and pump bunded.	Punctured drum most likely cause of spillage Location of drum handling reduces risk. Single drum failure reduces likely fugitive quantity	Significant loss of these materials to controlled water not envisaged.	Low
Spillage of solid (ACH flake/polyox)	Controlled waters	Site drainage system	Material solid and easy to contain and dispose of. Wind blown dust avoided because material handled indoors. Some leaks occur at slide valves and rotary valves and during ACH flake offloading but these are small and cleaned up inside the building.	Split bag or keg most likely cause of spillage Location of solid handling reduces risk. Material easily contained and disposed of.	Significant loss of these materials to controlled water not envisaged. Materials are of low environmental risk.	Low
To land						
Spillage of raw materials as detailed above	Land	Spillage	Same protection measures as detailed above	As above Location of handling and other measures as detailed above reduce risk. Some materials easy to contain and	.Loss of material to the land could cause short term impact which could be rectified by removal of contaminated soil.	Low providing measures maintained

				dispose of and of low environmental risk		

Fugitive emissions management plan for Releases from Boiler operation

What do you do that can harm and what could be harmed			Managing the risk		Assessing the risk	
Hazard	Receptor	Pathway	Risk management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
To Air						
Natural gas release	Atmosphere	Leak from gas equipment	Gas detection and shutdown valves. Engineering standards and inspection based on risk. Operation of boilers not possible if gas leak is present so incidence will be short lived.	Low	Low	Low
To water						
Spillage of diesel	Controlled waters	Site drainage system	Gas boiler operation reduces frequency of tanker offloading and therefore reduces risk of spillage. Diesel tank self bunded to 110% of operating level, high level alarm. Pipework and pumps located within building so leaks contained. Minor spills contained and cleaned up using absorbent material.	Minor spillages of diesel to hard standing can occur occasionally during tanker offloading (which is a very infrequent operation) and from equipment but these are contained using absorbent material. Major spillage unlikely.	Diesel to stormwater drain.	Low providing measures maintained
Spillage of water treatment chemicals	Controlled waters	Site drainage system	Self bunded tanks contained within bunded building	Low	Not envisaged	Low
To land						
Spillage of diesel	Land	Spillage over unmade ground	Gas boiler operation reduces frequency of tanker offloading and therefore reduces risk	Minor spillages of oil to hard standing can occur	Oil in sensitive environment	Low providing measures maintained

What do you do that can harm and what could be harmed			Managing the risk		Assessing the risk	
Hazard	Receptor	Pathway	Risk management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			of spillage. Diesel tank self-bunded to 110% of operating level, high level alarm. Pipework and pumps located within bunded area or building so leaks contained. Minor spills contained and cleaned up using absorbent material.	occasionally during tanker offloading and from equipment but these are contained using absorbent material. Major spillage unlikely.		
Spillage of water treatment chemicals	Land	Spillage over unmade ground	Self bunded tanks contained within bunded building	Low	Not envisaged	Low