Non-technical Summary

Holmfirth Dyers Limited

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Document control

Role	Responsibility
Group Risk & Compliance Manager	Originator, Reviewer
Commercial Director	Approver

Revision	Date	Summary	Status
R.01	27/05/2022	Originated	Draft
R1	15/07/2022	Approved	Published

This is a working document that will be reviewed at least every two years to ensure that it remains relevant to site operations and to determine whether further controls or improvements can be implemented.

Introduction

Holmfirth Dyers Limited is located at the site known as Ribbleden Dye Works on Dunford Road in Holmfirth, West Yorkshire, and is located next to and directly over the River Ribble.
Holmfirth Dyers Limited, is a wholly owned subsidiary of Holmfirth Dyers Holdings Limited, which in turn is a wholly owned subsidiary of Camira Fabrics Limited. The ultimate parent company is Camira Group Holdings Limited.

Holmfirth Dyers Limited provides commission dyeing and specialist finishing services to the textile weaving industry, which includes processing of textiles fabrics made from natural, synthetic and multi-fibre blends.

The facility is currently permitted for Consent to Effluent Discharge at one point source, and Water Abstraction from two sources, by the statutory broker Yorkshire Water and from the Environment Agency, respectfully.

The Consent for Effluent Discharge was first consented by Yorkshire Water on the 14th January 1983, and was last reviewed and signed by the authorised signatory on the 4th January 2021, allowing for discharge of treated effluent to the local foul sewer network from the site. The registration number for the current Consent permit is Y/4824/20D.

Permits are held from the Environment Agency for the permission of water abstraction from both the permitted borehole on site, as well as the local inland water source of the River Ribble. These permits were both originally issued on the 28th of April 1966, and last made effective from the Environment Agency on the 10th and 11th May 2000 for river and borehole abstraction. These permits are effective until revoked by the Environment Agency and held under the Licence Numbers 2/27/10/083 and 2/27/10/082, respectfully.

Scheduled Activities

The activities carried out and quantities used at the Holmfirth Dyers Limited facility fall under the Regulated Activities of Schedule 1 of The Environmental Permitting (England and Wales) Regulations 2016, specifically:

SECTION 6.4
Coating Activities, Printing and Textile Treatments

Part A (1)(b)
Pre-treating (by operations such as washing, bleaching or mercerization) or dyeing fibres or textiles in plant with a treatment capacity of more than 10 tonnes per day.

Directly Associated Activities:

Name of DAA	Description of the DAA	Schedule 1 Activity for which the DAA Serves
Storage and handling of raw materials	Storage and handling of textile raw materials, dye and finishing (process) chemicals, product packaging, cleaning chemicals, ETP treatment chemicals and fuel.	6.4 Part A(1)(b)
Cooling and refrigeration	Ammonia and F-Gas storage providing cooling and refrigeration of process activity areas	6.4 Part A(1)(b)

Handling and storage of waste materials	Handling and storage of waste materials arising from product manufacturing and ETP treatment	6.4 Part A(1)(b)
Operation of gas-fired boilers	Operation of two gas-fired boilers providing steam and heating to the process activities	6.4 Part A(1)(b)
Storage of finished product	Storage of finished product within the site warehouse	6.4 Part A(1)(b)
Treatment of trade effluent	Treatment of effluent via caustic soda within an on-site effluent treatment plant prior to discharge through sewer	6.4 Part A(1)(b)

Table 1 – Directly Associated Activities (HFDB302 – Directly Associated Activities)

Site Activities

The primary production process undertaken by Holmfirth Dyers Limited involves various methods, depending on the textile involved and the required output, however, it can be broken down into the following core processes:

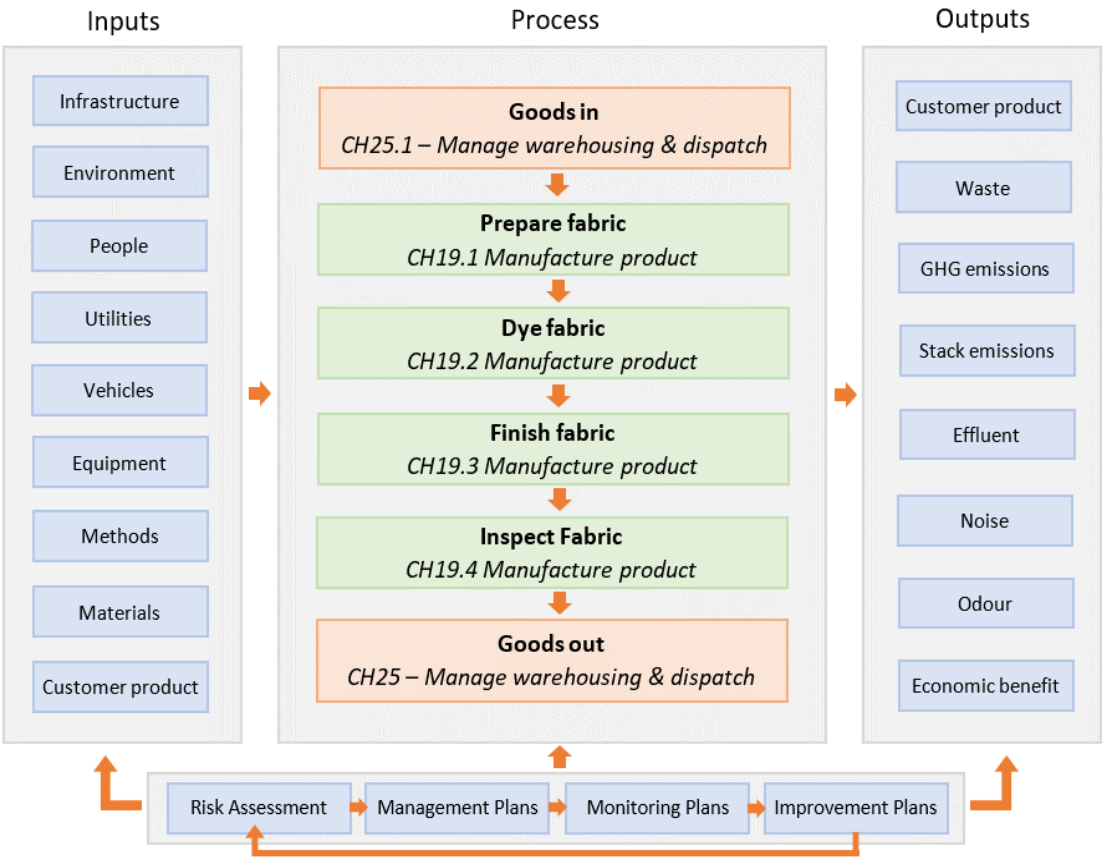

Figure 1 – SIPOC Process Overview

The core processes listed above are available as integrated flowcharts. Where required, the integrated flowcharts are supported by more detailed standard operating procedures, work instructions and other administrative controls.

CH25 - Manage warehousing & despatch - (goods in and goods out)

Inputs	Outputs
Vehicles: 7.5ton HGV, and FLTs	Product: pre-production stock
Utilities: diesel, electric	Product: post-production stock
Infrastructure: loading bay, walkway & curb	GHG emissions: mobile combustion, electricity
Environment: mild-moderate weather, light	Abnormal: noise
Employees: drivers & operatives	Emergency: fuel spillage
Product: fabric in stillages	

Table 2 – Inputs & Outputs – Goods In & Out

The goods in and goods out process operates Monday to Friday, between the hours of 6am and 6pm. One 7.5-ton HGV is used to collect and deliver customer property from and to Camira Fabrics facility, travelling 3.8 miles to and from the Holmfirth Dyers facility. Up to six round trips are completed daily. The reported 2021 greenhouse gas emissions attributed to combustion of diesel fuel in road vehicles equated to 93.56 tCO2e.

Customer property is transported in steel-framed stillages. Fork-lift trucks are used to load and unload the stillages from the HGV, crossing from the Holmfirth Dyers loading bay across the pedestrian walkway to the curb side of Dunford Road. On the opposite side of Dunford Road, the front aspect of two residential properties is located directly facing the Holmfirth Dyers loading bay.

Dunford Road (B6106) is classed as an urban road. Utilising the Department for Transport Statistics, it is reasonable to estimate that up to approximately 2,500 vehicles travel past Holmfirth Dyers daily.

A noise assessment carried out in March 2022 determined the following impacts to receptors locations indicated in figure 5 under 'Site Plans':

Receptor & Time	Background Sound Level	Measured Sound Level	Acoustic Feature Correction	Rating Level	Excess Over Background	Impact Indication
R1 Daytime	47	56	3	59	12	Significant
R1 Night-time	41	47	0	47	6	Adverse
R2 Daytime	47	50	3	53	6	Adverse
R2 Night-time	41	48	0	48	7	Adverse
R3 Daytime	47	49	0	49	2	Unlikely
R3 Night-time	41	41	0	41	0	Low
R4 Daytime	47	55	3	58	11	Significant
R4 Night-time	41	47	0	47	6	Adverse
R5 Daytime	47	52	3	55	8	Adverse
R5 Night-time	41	45	0	45	4	Unlikely

Table 3 – Assessed Noise Levels

CH19 - Manufacture product - (preparation - unroll, cut, tumble)

Inputs	Outputs
Vehicles: FLTs	Product: mid-production stock
Utilities: gas, electric	Waste: fabric, pallets, card cores, polythene
Infrastructure: storage	GHG emissions: stationary combustion, electricity
Environment: stable temperature, humidity, light	Point source emissions:
Employees: operatives	Abnormal:
Equipment: perch, blades, tumbler	Emergency:
Method: product specification	

Product: pre-production stock	

Table 4 – Inputs & Outputs - Preparation

Customer product is provided rolled over a cardboard core and requires unrolling into a cart as the first step into the production environment. Cardboard cores cannot be reused and are therefore disposed of and recycled. Other waste streams may be present at this stage depending on how the product was packaged by the customer, therefore it may be required to also dispose of wooden pallets and polythene.

Woven lengths of fabric require breaking down into workable lengths, therefore Holmfirth Dyers cut the piece sizes to a suitable length for the processing required.

To help relax the fabric and improve dimensional stability in later processes, it is tumbled. Tumbling is a gas supplied, dry, heated process, with no point source emission.

CH19 - Manufacture product - (dry cleaning, heat setting, winch dyeing, jet dyeing)

Inputs	Outputs
Vehicles: FLTs	Product: mid-production stock
Utilities: gas, electric, water	Waste: fabric, pallets, card cores, flock
Buildings: storage	Hazardous waste: substance containers
Environment: stable temperature, humidity, light	GHG emissions: stationary combustion, electricity
Employees: operatives	Point source emissions: effluent, stack
Equipment: dry cleaner, dye vessel, tenter, boilers	Abnormal: odour, noise
Substances: chemicals, dyes	Emergency: spillage, fire
Method: product specification, COSHH	
Product: mid-production stock	

Table 5 – Inputs & Outputs – Dyeing, Cleaning, Heat Setting

Dry cleaning is a solvent scouring process that involves the treatment of fabrics such as polyester and wool using a medium of organic solvent to remove impurities, such as dirt and oil. After being transported through solvent, the fabric passes through a chamber where steam is injected, rapidly evaporating solvent soaked into the fabric, and removing impurities along with it. When the steam and vapor condense, the water and solvent are once again separated, allowing for some re-use of the solvents. This method therefore reduces water pollution as well as energy cost and consumption, in comparison to other scouring methods. Any oils removed during this process are collected in an IBC for disposal as waste oil.

Heat setting aims to impart shape retention, crease resistance and elasticity to the fabric fibres, and can be used for drying and heat setting. Heat setting aims to set the materials at their required weight and width, making the fabrics stable prior to further hot processes. Heat setting is achieved by the use of two tenter ('stenter') frames. These machines run continuously, applying heat uniformly across the inputted fabric while maintaining the desired product width. The process involves subjecting the fabrics to dry hot air for a few minutes, which is then followed by cooling. Holmfirth Dyers considers the initial heat setting as a critical process, as it must be done prior to the wet processes involved in dyeing, to avoid issues such as discolouration. Holmfirth Dyers may in some circumstances also utilise a tenter frame before dry cleaning to pre-set fabric. The tenter frames on site provide the output stack emissions via the two air point sources identified within Figure 1 (Site Plans - scope & boundaries).

Winch dyeing is utilised as well as jet-dyeing by Holmfirth Dyers depending on fabric and output product to be processed. The two winch dyeing machines on site are utilised for lighter-weight textiles, using a process where dyeing liquor remains stationary while the textiles are transported through the machine via the winch.

Jet dyeing is a modern dyeing process primarily used for synthetic fabrics, where both the fabric and dye liquor are in motion, enabling a dyeing process which is quicker and more uniform than other methods. Fabric is moved by the force of water at different speeds around a tube, while a jet of dye liquor is also pumped out from an annular ring. The high force and pressure of the dye liquor passing through the tube pulls the fabric with it, which moves slowly in folds around the machine before passing through the jet once more. The process is economical as it uses a lower ration of dyeing liquor, while also using a lower consumption of water, providing further energy savings, and faster heating/cooling of fabric. Ten jet-dyeing units with measurable viewing glass are utilised on site, installed in 2018.

Dye liquor concentration is controlled using a check weigh system which provides automatic dosing of powder dyes according to pre-set recipes.

CH19 - Manufacture product - (finishing - chemical application, crop, press, steam)

Inputs	Outputs
Vehicles: FLTs	Product: mid-production stock
Utilities: gas, electric, water	Waste: fabric, pallets, card cores, flock
Buildings: storage	Hazardous waste: substance containers
Environment: stable temperature, humidity, light	GHG emissions: stationary combustion, electricity
Employees: operatives	Point source emissions: effluent, stack
Equipment: Sperotto, KD, steam box, cropper, dye vessel, winch, de-twister	Abnormal: odour, noise
	Emergency: spillage, fire
Substances: chemicals	
Method: product specification, COSHH	
Product: mid-production stock	

Table 6 – Inputs & Outputs - Finishing

Holmfirth Dyers Limited provide a variety of chemical finishes that aim to imbue fabric with technical performance or physical attributes, such as flame retardancy, anti-microbial, or stain repellent properties. Chemical finishing being a wet process requires both use of water and production of effluent, followed by drying processes requiring the use of the tenters resulting in point source emissions to air. Fabrics are finished either through coating or exhaust methods, depending on the natural or synthetic fibre content.

To attain uniform surface fibre length, fabrics are cropped. This process generates short fibre length flock that is collected in bags and disposed of as general waste.

The 'Sperotto' and 'KD' are the two machines employed with the aim of further improving dimensional stability. While the KD performs decatising, operating under tension, rolling over a perforated barrel, the Sperotto performs sanforizing and decatising processes without tension over a conveyor belt. Both methods use steam to achieve the intended outcome of preventing fabrics from suffering shrinkage. The process creates a fugitive emission of steam, with the machine aiming to condense and collect the majority to avoid drips onto the fabric.

CH19 - Manufacture product - (inspect)

Inputs	Outputs
Vehicles: FLTs	Product: fabric in stillages
Utilities: electric	Waste: fabric, pallets, card cores
Buildings: storage	GHG emissions: electricity
Environment: stable temperature, humidity, light	
Employees: operatives	
Equipment: perch	
Method: product specification	
Product: post-production stock	

Table 7 – Inputs & Outputs - Inspection

Fabrics are inspected on site, checking for colour match and other physical flaws. Where non-conforming product is identified, this is reworked by reprocessing through earlier stages and then reinspected. Fabrics that pass inspection are packaged up either in a polythene wrap or stacked into a customer stillage and processed back through CH25 - Manage warehousing and despatch (goods in and goods out) process for delivery back to the customer.

Inputs & Outputs

Effluent Treatment

Holmfirth Dyers Limited operates under the conditions of an effluent discharge consent (Y-4824-20D) issued by Yorkshire Water. The latest version was issued in 2021 and incorporated an allowance for increased volume.

To help maintain compliance with the permitted volume, this is measured and monitored daily. Furthermore, the discharge rate is throttled to prevent exceeding the 26 l/s limit. The daily average throughput for the Effluent Treatment Plant in 2021 is 546.3m^3

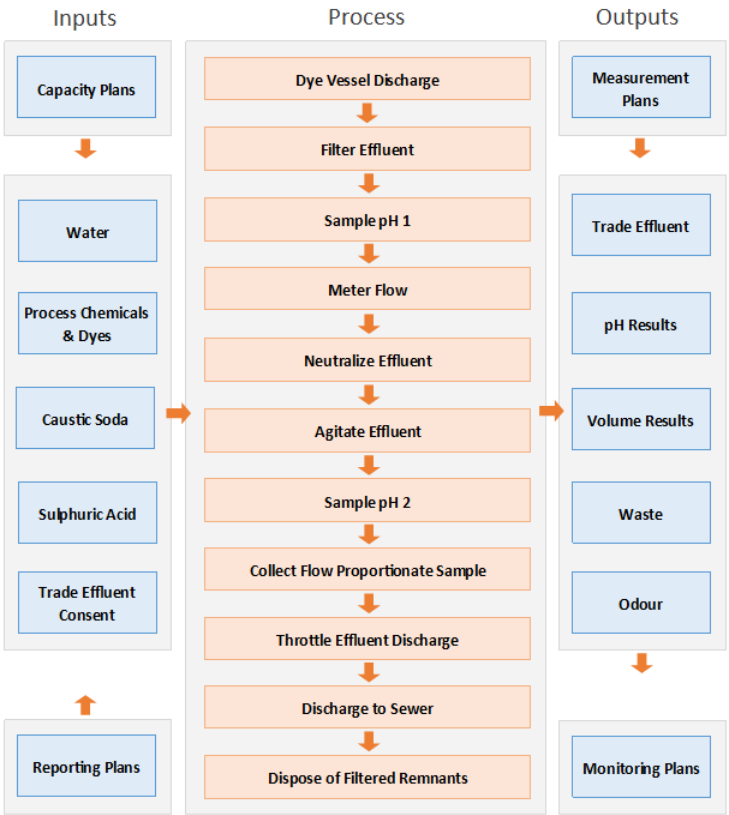

Figure 2 – Effluent Treatment Process Flow

Due to the chemicals and dyes used in the process, the effluent can become acidic and therefore must be treated before it is discharged. An Effluent Treatment Plant (ETP) is utilised on site, just prior to the point of effluent discharge. The plant uses chemical dosing of caustic soda (sodium hydroxide) in order to balance the pH levels to the parameters set out within the Consent to Discharge provided by Yorkshire Water. A system for automatic sampling and dosing is used to ensure pH levels at the discharge point are maintained within the compliance parameters.

A continuous wheel is utilised to pass through the effluent before its discharge, picking up and extracting any solids within the effluent. Solids contained within the effluent consist of flock and residual yarn from the dyeing processes. The solids are collected in troughs adjacent to the ETP, where they are subsequently collected manually using waste bags and disposed of as general waste.

Apart from the volume and pH, none of the other conditions are routinely monitored or measured by the site. Instead, the site relies on the routine sampling conducted by Yorkshire Water for monitoring and measurement against the conditions relating to temperature, Chemical Oxygen Demand (COD), COD load, settleable solids, or easily liberated Sulphide.

Water Abstraction

The facility utilises both the local inland water source of the River Ribble, as well as a borehole not exceeding a depth of 49 metres for water abstraction and supply to the site. These activities are permitted by the Environment Agency until permits are revoked, effective from March 2000, for the purpose of supplying the dyeing processes undertaken on site.

Water consumption through both methods of abstraction is measured monthly and recorded, to ensure compliance with the consumption limits set by the abstraction permits.

Waste

The facility produces general waste, textile residue waste, cardboard waste and mixed steel waste, which are all segregated and stored within different units on the site. General waste, cardboard waste, and mixed steel waste are kept within large skip containers within the site exterior.

Waste quantities are monitored and measured wherever possible and if recycling is not possible, then waste to energy is prioritised over waste to landfill.

The majority of textile waste is recovered by a specialist textile merchant and sold into alternative markets or recycled back to fibre. Textile residues that cannot be recycled due to short fibre length are collected in bags and disposed of with general waste.

Empty dye and chemical containers, and IBCs are returned to suppliers. Serial numbers are used to track use of IBCs with the purpose of extending the life cycle through washing and re-filling. At the IBCs end of life, they are recycled as scrap metal and granulated plastic.

The below table provides some examples of how Holmfirth Dyers has met, and will continue to meet, its obligation to implement the waste hierarchy:

Rethink/Redesign	Installation of chemical dispensing tank farm, to remove the need for IBCs in some areas.
Reduce	Use of stillages to transport fabric to reduce the need for wooden pallets.
Reuse	Used drums and IBCs returned to supplier for cleaning and reuse.
Recycle	Paper, plastics, metal, and textiles recycled with a contractor or by the Camira Group.
Recover	Substances and oils recovered and returned to supplier for reprocessing.
Dispose	Household waste and very short textile fibres subject to RDF and occasional landfill.

Table 8 – Waste hierarchy

Maintenance & Housekeeping

The site and processes use approximately 90 pieces of equipment that require planned preventive maintenance to ensure their good working order. Planned preventive maintenance is managed using specialist maintenance software. An export of the PPM schedule from July 2022 is available for review in the Part A permit management system.

The inhouse maintenance team is made up of three engineers who are responsible for conducting planned preventive and corrective maintenance activities. Where planned or corrective maintenance requires a specialist engineer, the team is responsible for identifying and managing contractors on site.

General housekeeping of office areas, canteens and welfare facilities is outsourced to a professional cleaning company. All chemicals used by the cleaning company are included in the HFD chemical inventory.

The site operates in accordance with the Group Incident Management Spill Procedure, which in linear form is:

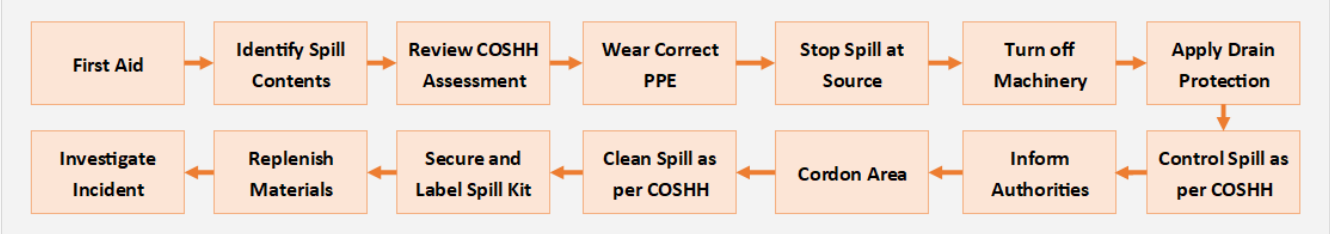

Figure 3 – Linear Spill Procedure

Chemical Management

Chemicals in use are stored close to the relevant process and machine, throughout the facility. Stock chemicals are stored in the internal bunded chemical store.

An inventory of all chemicals on site is kept within the online COSHH management software; Sypol CMS, produced by Alcumus Group Limited. This inventory also details the COSHH assessments and Safety Data Sheets (SDS) of all stored chemicals, as well as noting their recorded location on the site.

F-Gas & Refrigeration

There are 4x Mitsubishi split systems servicing 4x internal air units. All these units are charged with R410a refrigerant gases. However, these are all below the charge threshold that qualifies them to require regular F-Gas inspections.

The total area cooled is 83.12 m2. The total air conditioning cooling capacity servicing this area equates to 37.1 kW, and a total of refrigerant weight of 11.95 kg. TM44 inspections are required every 5 years. For evidence of the site F-Gas register and servicing for the F-Gas storing units on site, see the documents: HFDB210a - Holmfirth Dyers AC Work Report and HFDB210b - AC Register.

Emissions to Air

Two natural gas-fired steam boilers are alternated in their use each day on site to provide heat and power for the core processes. The boilers were commissioned on site in 2002, with normal running hours between 4am and 6pm, outputting around 2,200kg of steam per hour, with approximated annual operating hours of 1,800 each and maximum annual operating hours of 2,768. The boilers each use a Megawatt Thermal Input of 5.52MWth, falling inside the scope of the Medium Combustion Plant Directive (MCPD).

Together with the tumbler unit, the boilers provide one of the sites point source emissions, utilising the original 115ft stack, ref A1 as in Figure 5. Within the 'HFDB305 H1TOOL_2.78,' point sources A1a and A1b refer to the two boilers, respectively, while A1c refers to the tumbler unit which also emits from the same stack.

The two tenter frames provide for the second point source air emissions on site, utilising two stacks, A2 and A3, as in Figure 5. The two frames join together in flue to emit from only Point A2 in normal operations. Combining this reduction with the Electrostatic Precipitator Abatement system (See document 'HFDB3 – BAT Assessment') allows for significantly reduced emissions as highlighted within the stack emissions report 'LNO 15340 Camira Holmfirth Dyers Polyester FR Treated Report V1'. Point A3 is only used as a bypass emissions point, where the abatement system requires stopping for works or testing, emissions are redirected to Point A3, however this occurs very infrequently, as such, emissions testing has not been conducted for point A3, and it is deemed outside the scope of the air emissions risk assessment 'HFDB305 H1TOOL_2.78' due to its rare usage.

Steam is released on its own at B2 from the Sperotto and KD Machine as noted within the site plan, document reference 'HFDB2 Site Layout- 04-03-22'.

Figure 4 - Site Boundary

As a result, B2 has also been left outside of the scope of the H1 risk assessment, as no harmful emissions are known to release from the location.

Similarly, Point A4 as shown on Figure 5 has also not been included within the risk assessment. Point A4 shows the release point of the winch-dyeing line within the site dyehouse. Holmfirth Dyers Technical Manager, David Ducker determined that there are no emissions releases from the process other than condensation, due to the nature of the activity – all input chemicals must remain within the liquor for the product quality to be achieved. Formal justification to provide supporting evidence of this can be found within the application folder 'HFDB305b - A4 Exclusion Justification'.

Four stack emissions tests were conducted on A2 in October 2019, for four different fabric processes utilising the tenter frames. These were conducted by Socotec Ltd with MCERTS accreditation, using various methods for testing accredited to British Standards, such as BS EN 12619:2013 for Total Volatile Organic Compounds. The reports conclude with emission levels for each gas tested not significant enough to require further abatement.

Further stack emissions tests were carried out for point A1, including three separate tests for combustion gases for the two boilers and the tumbler, respectively. The tests were carried out by Envirocare Ltd with MCERTS accreditation.

The abatement system installed utilises two ESP cells connected to the stack for electrostatic precipitation, installed in 2019. The system also utilises two polypropylene demister cartridges.

Within Figure 5, as previously stated, B2 refers to the steam emission point, while B1 identifies the point of effluent discharge to Foul Drain on site.

Figure 5 – Enhanced Site Boundary with Emissions Points

See the document HFDB305a - Stack Heights for detailed information on emissions point sources.

Energy Efficiency Measures

Company vehicles are registered and monitored with their use of fuels, as well as energy and water consumption. Water consumption is recorded via measurements of water abstraction and discharge quantities. The document 'Water Abstraction' details usage from the two permitted sources, borehole and river, as well as the consumption limits that must be adhered to. Holmfirth Dyers receives and documents return forms from the government detailing consumption from abstraction. Discharge rates are monitored continuously and recorded daily within the document 'Effluent Daily'. Effluent is also sampled by Yorkshire Water and these sample tests are recorded by Holmfirth Dyers.

Energy usage is monitored and recorded through each avenue on site within the document Energy Dashboard, and further to this, Camira Group record and report Greenhouse Gas emisssions within the document 'Camira Greenhouse Gas Emission Reporting Process and Workbook 2021,' which also documents emissions sources such as from refrigerants on site and electricity consumption. Stack on site at Holmfirth Dyers also undergoes emissions testing, which can be observed in the 'Stack Emissions' folder.

The site does not currently use renewable energy sources. Rainwater is harvested within the abstraction ponds to increase efficiency and reduce pressure on abstraction from groundwater sources. The dyeing processes utilised on site are dependent on the use of large quantities of water, and as such the concentrations are monitored as described above to ensure correct concentrations are met and water abstraction is limited to that required by production.

Camira Fabrics has appointed Verco Advisory Services Ltd to provide support in achieving net-zero carbon emissions. In the short-term emphasis will be on Holmfirth Dyers due to its increased gas consumption in comparison to other Camira sites. This is a project that has just begun in Quarter 2 of 2022, and as such a project plan/objectives have not currently been documented.

Finally, Holmfirth Dyers Ltd has set and operates to try and achieve its Key Performance Indicator (KPI) targets. A summary of the KPI targets for 2021 can be viewed below as Figure 6.

Aspect	Input	Unit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD	Limit
Holmfirth	**CCA Target**	kWh/m	4.32	4.02	3.89	4.83	4.09	3.66	3.98	3.72	1.79	4.41	3.10	5.43	**3.62**	3.64
Holmfirth	**River Water Abstraction**	m³	4939.0	10008.0	7652.0	8725.0	5375.0	9907.0	8663.0	9001.0	10624.0	12531.0	10398.0	3544.0	**101367**	7083
Holmfirth	**River Water Abstraction**	m³/day	224.5	500.4	347.8	436.3	282.9	450.3	376.7	450.1	482.9	569.6	495.1	168.8	**399**	91
Holmfirth	**Borehole Water Abstraction**	m³	4777.0	4034.0	3859.0	5268.0	6863.0	7250.0	6854.0	6919.0	4449.0	7833.0	8185.0	5464.0	**71755**	7577
Holmfirth	**Borehole Water Abstraction**	m³/day	217.1	201.7	175.4	263.4	361.2	329.5	298.0	346.0	202.2	356.0	389.8	260.2	**283**	364
Holmfirth	Total Water Use	Ltr/m	23.8	32.7	27.2	46.3	33.6	37.4	40.3	48.7	15.1	46.2	25.5	30.3	**33.92**	36.3
Holmfirth	**Water Discharge**	m³/day	777.95	822.45	702.14	716.65	851.21	825.86	797.22	703.50	651.68	892.36	936.90	707.62	**782.13**	1400
Holmfirth	Water Discharge	Ltr/m	41.94	38.31	36.53	47.40	44.43	39.58	47.63	43.03	14.35	44.52	26.99	50.03	**39.56**	36
Holmfirth	Recycled Waste	%	0	0	0	0	0	0	0	0	0	0	0	0	**0.00**	80
Holmfirth	Carbon Footprint	t CO2e	348	343	327	291	296	336	307	246	355	388	447	318	**333.42**	298
UK Operations	Carbon Footprint	t CO2e	1,285	1,267	1,158	883	695	729	665	600	748	824	895	1,145	**908**	817

Figure 6 – Holmfirth Dyers KPI's for 2021