APPLICATION FOR AN ENVIRONMENTAL PERMIT

ICT UK Paper Mill - Application Reference (WPCC8848)
Industrie Cartarie Tronchetti UK Limited

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NON-TECHNICAL SUMMARY

Introduction

This document and associated appendices form the application for an Environmental Permit (EP) to operate a paper production facility under the Environmental Permitting Regulations 2016 (as amended). The application is made by Industrie Cartarie Tronchetti UK Limited which is the legal entity that will be responsible for operating the installation.

Industrie Cartarie Tronchetti (ICT) is a multinational manufacturer of paper tissue products with its headquarters based in Lucca, Italy.

The proposed installation will consist of pulp storage, bale handling, paper manufacture hall, jumbo rolls storage, converting area, raw materials storage, high bay warehouse, dispatch, water treatment plant, chemical storage, Combined Heat and Power (CHP) plant and boilers. The facility will be built as three phases.

Site Location

The site address will be part of the Northern Gateway industrial area in Deeside, Flintshire, North Wales. The approximate post code is CH5 2RD and the site is centred at National Grid Reference (NGR) SJ 32056 69754. The site will cover approximately 31.45 hectares.

The closest sensitive ecological receptor is the Dee Estuary (Ramsar, Sites of Special Scientific Interest, Special Area of Conservation and Special Protection Area) located approximately 0.6km to the south.

Activity Description

The paper mill is to be built over three phases as follows:

- Phase 1 of the Paper Mill Facility: 2022 (Q3) - 2024 (Q1)
- Phase 2 of the Paper Mill Facility: 2024 (Q4) - 2026 (Q2)
- Phase 3 of the Paper Mill Facility: 2034 (Q1) - 2035 (Q3)

Phase 1 will comprise pulp storage, bale handling, paper manufacture hall, jumbo rolls storage, converting area, raw materials storage, high bale warehouse, dispatch, water treatment plant, chemical storage, CHP plant and 2 boilers.

Phase 2 will comprise pulp storage, bale handling, paper manufacture hall, jumbo rolls storage, and CHP plant.

Phase 3 will comprise pulp storage, bale handling, paper manufacture hall, jumbo rolls storage, converting area, high bale warehouse and CHP plant and 2 boilers.

All three phases will be permitted from the start of operations.

All paper will be produced using virgin pulp which will be delivered to site already prepared. Any waste pulp produced will be reused within the process to minimise waste. Each paper machine will make ~70,000 tonnes per year of tissue.

The activities to be undertaken at the installation are summarised below:

- **Raw Material Storage** ï Bales of cellulose are stored in the pulp storage warehouse prior to being used to produce the tissue paper. All chemicals used in the process will be stored within dedicated chemical storage areas. Gas and water are supplied from mains via pipe connections.

- **Pulp Preparation** - The cellulose bales are pulped in the pulper machine by mixing with water and subjected to mechanical action from the rotor equipped with blades placed at the base. This disintegrates the fibres to produce the pulp stock.
- **Pulp Treatment** - The pulped stock is sent through a series of machines that separate small debris and break up clumps. Wastewater and impurities are sent to the water treatment facility.
- **Formation of tissue paper and winding in reels** ï Pulp is sent to the paper machine where it is placed on wire and felt where the excess water is drained leaving a wet fibre sheet. This is transferred to a drying section by means of the felt where it is pressed and dried using the Yankee dryer, a cylindrical drum heated by steam, and hot air generated by hoods above the Yankee. This dries the sheet to form the tissue paper. The tissue paper is scraped from the Yankee drying cylinder using a steel blade to form a creped structure and then wound on reels and wrapped in polythene prior to storage in the jumbo reels warehouse.
- **Multi-ply paper formation** - This process converts the jumbo reels into tissue products such as toilet rolls, kitchen towels etc. The jumbo reels are transferred to a converting machine where they are unwound and rewound, coupling one or more plies together and then, if needed, cut to size through circular blades to form the final product which is then stored prior to dispatch from the site.
- **Heat and Power Generation** ï Heat and power for the installation will be generated on site. Each paper line phase will consist of a 24.16 MW_{th} gas turbine and combuster unit, 14.6 MW_{th} post burner boiler for supplying steam and a 13.6 MW_{th} burner for supplying heat to the Yankee Hood should the CHP unit not be running. Gas boilers are installed to supply heat to the production hall. In addition to the main heat and power generation, there will be a diesel emergency backup generator installed. The installation will send excess electrical energy from the CHP plant to the national grid when available and import electricity from the national grid where there is a shortfall on site.
- **Wastewater Treatment** ï Wastewater from the production facility is treated on site using a number of stages including sedimentation / flotation, oxidation / MBBR and filtration. The wastewater treatment plant produces a sludge which is dewatered and sent off site for disposal. The wastewater treatment plant will discharge ~ 4,563 m^3/day into the Dee Estuary.

The activities to be carried out at the site fall under the requirements to be permitted as a Part A (1) installation under the Environmental Permitting (England and Wales) Regulations 2016[1] as follows:

- Section 1.1 Part A (1) (a) - Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts;
- Section 6.1 Part A (1) (b) ï Producing in industrial plant, paper and board where the plant has a production capacity of more than 20 tonnes per day; and
- Section S5.4 Part A (1) (a) (i) ï Disposal of non-hazardous waste in a facility with a capacity exceeding 50 tonnes per day by biological treatment.

In addition to the main activity, the following directly associated activities (DAAs) will be carried out at the site:

- Surface Water - Discharge of clean uncontaminated site surface water from roofs, paths and roads:
- Raw Materials Storage

[1] https://www.legislation.gov.uk/uksi/2016/1154/contents/made

- Waste Storage

Management Activities

An environmental management system (EMS) will be in place prior to the facility coming into operation, which will cover the elements required by the Environmental Permit; this includes details of the site operations, maintenance procedures, accident and incident management; non-conformances and complaints procedures; staff training and records management.

Energy Efficiency

The energy consumption for the facility is approximately 66,000 MWh / year of electrical energy. As part of the site EMS, an energy efficiency plan will be produced which will include the following:

- Energy management policy;
- Monitoring and targeting;
- Specific energy consumption;
- Operating and maintenance procedures to reduce energy consumption;
- Energy efficiency measures/techniques; and
- Review of energy / materials consumption per tonne of paper produced

Raw Materials, Water and Waste

The main raw materials used within the installation will be pulp, gas for heat and power generation and water for preparing the pulp. Chemicals for the manufacture process and wastewater treatment will also be used.

Mains water will be used to prepare the pulp for the paper making process along with use in providing heat through the generation of steam for the process.

The main wastes produced at the installation will be wastewater which will be treated in the on-site wastewater treatment plant, sludges from the wastewater treatment plant, packaging such as IBCs, cardboard and paper, and metallic wire from cellulose bales.

Emissions to Air

Emissions to air will result from the combustion of natural gas within the CHP plant, boilers and the dust removal systems which will be released into the atmosphere via dedicated exhaust stacks.

A stack height assessment has been carried out to determine the height for the main stacks, which has been determined to be 30 m and the effects on air quality from the installation have been assessed on this basis.

Detailed dispersion modelling has been carried out for the main stacks, by-pass stacks and boiler stacks for all phases. Detailed modelling has also been undertaken for particulate emissions. The predicted emissions at sensitive receptors surrounding the plant are below the required air quality standards. The assessment of air quality effects concluded that NOx and particulates can be screened out as insignificant at all relevant ecological sites and sensitive receptors.

Emissions to Surface Water

Treated water from the wastewater treatment plant will discharge to the Dee Estuary. The emissions from the wastewater treatment plant have been assessed and it is concluded that, even during low tide and low river flow conditions, the proposed paper mill discharge would not result in unacceptable water quality impacts within the receiving water.

Clean, uncontaminated surface water from roofs, hardstanding and paved areas etc will discharge to a series of swales around the installation.

Emissions to Sewer, Land and Groundwater

There will be no process water discharges to sewer, land or groundwater from the permitted activities at the installation.

Fugitive Emissions

The potential fugitive emissions from the site are leaks and spillages from external storage areas, dust and VOCs from oil/diesel storage. All liquids with the potential to cause pollution will be stored in appropriate containers and provided with suitable secondary containment. Procedures will be put in place as part of the environmental management system for the facility to minimise the risk of fugitive emissions from the site.

Fugitive emissions are assessed in the environmental risk assessment and the risk from fugitive emissions is considered to be low.

Odour

The main potential source of odour from the installation is from the wastewater treatment facility for which a qualitative odour screening assessment has been undertaken. The risk of odour from the facility been concluded to be insignificant

Noise and Vibration

The main noise and vibration sources will be the operation of internal equipment for the paper manufacturing and HGV movements. A noise and vibration assessment has been undertaken for the installation. The finding of the screening assessment concluded that the facility will not have any significant impacts on sensitive receptors.

Best Available Techniques

An assessment of the operation has been undertaken against the requirements of the BAT Reference Document for the Production of Pulp, Paper and Board. In summary, the proposed facility will be designed and operated to ensure that significant impacts to the environment and human health do not arise from its operation. The main plant will operate techniques that are proven and reliable and are concluded to represent Best Available Techniques (BAT).

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Tables

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Appendices

1 INTRODUCTION

1.1.1 This document and associated appendices form the application for an Environmental Permit (EP) to operate a paper production facility, under the Environmental Permitting Regulations 2016 (as amended)[2]. The application is made by Industrie Cartarie Tronchetti (ICT) UK Limited which is the legal entity that will be responsible for operating the installation.

1.2 Background

1.2.1 ICT is a multinational manufacturer of paper tissue products with its headquarters based in Lucca, Italy. The ICT manufacture and produce over 540,000 tons per year of tissue paper across a number of facilities in Europe and is a European market leader that specialises in premium products and adopts state of the art technology for their highest quality tissue production.

1.2.2 The paper mill is to be built over three phases as follows:

- Phase 1 of the Paper Mill Facility: 2022 (Q3) - 2024 (Q1)
- Phase 2 of the Paper Mill Facility: 2024 (Q4) - 2026 (Q2)
- Phase 3 of the Paper Mill Facility: 2034 (Q1) - 2035 (Q3)

1.2.3 The proposed installation will consist of pulp storage, bale handling, paper manufacture hall, jumbo rolls storage, converting area, raw materials storage, high bale warehouse, dispatch, water treatment plant, chemical storage and Combined Heat and Power.

1.2.4 Phase 1 will comprise pulp storage, bale handling, paper manufacture hall, jumbo rolls storage, converting area, raw materials storage, high bale warehouse, dispatch, water treatment plant, chemical storage and CHP.

1.2.5 Phase 2 will comprise pulp storage, bale handling, paper manufacture hall, jumbo rolls storage, and CHP.

1.2.6 Phase 3 will comprise pulp storage, bale handling, paper manufacture hall, jumbo rolls storage, converting area, high bale warehouse and CHP.

1.2.7 All three phases will be permitted from the start of operations.

1.2.8 All paper will be produced using virgin pulp which will be delivered to site already prepared. Any waste pulp produced will be reused within the process to minimise waste. Each paper machine will make ~70,000 tonnes per year of tissue.

1.3 The Site

1.3.1 The Site is located in North Wales, within the local authority area of Flintshire.

1.3.2 The site address is:

Unit C

The Airfields Roadside & Retail

Northern Gateway

Welsh Road, Deeside

Flintshire, CH5 2RD

[2] The Environmental Permitting (England and Wales) Regulations, 2016.

1.3.3 The centre of the site is at National Grid Reference (NGR) SJ 32056 69754.

1.3.4 Site layout plans can be found in Appendix B.

1.4 Sensitive Receptors

1.4.1 The Site lies in proximity to a number of sensitive areas as detailed in Table 1.1 below:

Table 1.1: Sensitive Receptors

Site Type	Site Name
Within 2km:	
Ramsar	The Dee Estuary
Special Areas of Conservation (SAC)	River Dee and Bala Lake
	The Dee Estuary
	Deeside and Buckley Newt sites
Special Protection Areas	The Dee Estuary
Sites of Special Scientific Interest (SSSI)	Afon Dyfrdwy (River Dee)
	Connahôs Quay Ponds and Woodland
	Dee Estuary / Aber Dyfrdwy
	Shotton Lagoons and Reedbeds
Local Wildlife Site:	River Dee Local Wildlife Site
Within 10km:	
Special Areas of Conservation (SAC)	Halkyn Mountain / Mynydd Helygain
Sites of Special Scientific Interest (SSSI)	Hallwood Farm Marl Pit
	Inner Marsh Farm
	Buckley Claypits and Commons
	Mynydd Y Fflint / Flint Mountain
	Maes Y Grug
	Comin Helygain A Glaswell Tiroedd Treffynnon / Halkyn Common and Holywell Grasslands
Local Nature Reserves	Burton Mill Wood
	Whitby Park
	Stanney Wood
	Rivacre Valley

1.4.2 The closest residential properties are at Garden City which is approximately 375m to the south-east.

1.4.3 The site is not situated in an air quality management area (AQMA).

1.4.4 The site is located within a flood zone C1. Flood zone C1 is defined as áareas of floodplain which are developed and served by significant infrastructure, including flood defences.

1.5 Surrounding Area

1.5.1 The Site is located on the western edge of Garden City, a village within the Sealand area of Flintshire. The nearest town centre is Queensferry, which is approximately 1.5 km to the south of the Site. The town of Mold is approximately 12 km to the southwest and the city of Chester is approximately 7.5 km to the east.

1.5.2 Beyond the western boundary of the site and the railway line is the Tata Steel Shotton site. North of the Airfields site is Deeside Industrial Park (DIP) which comprises a large number of distribution and manufacturing units.

1.5.3 Beyond the eastern boundary of the site is Welsh Road (B5441) which provides the main access to Garden City. Garden City was originally developed to house the workers of the Shotton Steelworks and comprises a mix of semi-detached and terraced housing. Garden City has some local facilities which include a pharmacy, church, post office, public houses and primary school. The River Dee runs to the south of the Site.

1.5.4 Location plans and site layout plans can be found in Appendix B.

1.6 Regulated Installation and Applicable Guidance

1.6.1 The activities to be carried out at the site fall under the requirements to be permitted as a Part A (1) installation under the Environmental Permitting (England and Wales) Regulations 2016[3] as follows:

- **Section 6.1 Part A (1) (b)** ï Producing in industrial plant, paper and board where the plant has a production capacity of more than 20 tonnes per day. Each paper machine will be capable of producing ~70,000 tonnes per year of tissue with an average production per machine of ~192 tonnes per day.
- **Section 1.1 Part A (1) (a)** - Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts. As some of the combustion plant will have a thermal input of above 15 MW, the aggregation rules set out within the Industrial Emissions Directive (IED)[4] will apply, however, as the emissions will be from separate stacks the installation is not classed as a large combustion plant (LCP). Accordingly, the installation does not fall within Chapter III of the IED and instead is a Chapter II combustion plant. The emission limits relevant to LCPs within the relevant BAT Conclusions do not apply. Each individual unit will be classed as medium combustion plant and required to meet those emission limits set out in the medium combustion plant directive[5].
- **Section S5.4 Part A (1) (a) (i)** ï Disposal of non-hazardous waste in a facility with a capacity exceeding 50 tonnes per day by biological treatment. The wastewater treatment plant will treat more than 4,563 m^3 per day by biological treatment.

1.6.2 In addition to the main activity, the following directly associated activities (DAAs) will be carried out at the site:

- Surface water - discharge of clean uncontaminated site surface water from roofs, paths and roads:
- Raw materials storage
- Chemical storage
- Waste storage

1.7 Structure of the Application Document

1.7.1 This section provides an overview of the proposals. This is supplemented by further details in Sections 2 ï 5 as follows:

[3] https://www.legislation.gov.uk/uksi/2016/1154/contents/made

[4] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32010L0075&from=EN

[5] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32015L2193

- Section 2 details the proposed management practices which will be in place at the plant, with specific detail covering:
  - Accident management;
  - Energy efficiency;
  - Efficient use of raw materials and water; and
  - Avoidance, recovery and disposal of wastes.
- Section 3 addresses the operational measures which will be in place to prevent and/or control any potential environmental effects of the proposal.
- Section 4 identifies the nature of emissions from the installation.
- Section 5 summarises the conclusions from the detailed impact assessments undertaken to predict any environmental effects from the installation.
- Section 6 summarises the outcome of the detailed assessments of Best Available Techniques (BAT) for the key plant and abatement systems proposed.

1.7.2 Supporting documents, assessments and application forms are provided within the appendices as detailed in the contents page.

1.8 Pre-application Discussions

1.8.1 Pre-application discussions (reference WPCC8848) were undertaken with NRW in September 2019. Whilst the papermill proposals have not changed from those discussed in 2019, the facility was to be located at a different site to that to which this application is for. NRW have confirmed that all advice given at the pre-application meeting in September 2019 is still relevant and applies to the new site and location. Some further pre-application advice was supplied by email dated 27th August 2021.

2 MANAGEMENT OF ACTIVITIES

2.1 Environmental Management System

2.1.1 A written environmental management system (EMS) will be developed prior to the commissioning and operation of the site. It will be prepared following the EA guidance (Develop a management system: environmental permits[6]), it will follow the principles of ISO14001 and ensure compliance with the requirements of the BREF for the production of pulp, paper and board.

2.1.2 ICT has implemented and maintains ISO14001 accredited Environmental Management Systems (EMS) for its existing paper mill sites. The EMS will be adapted to reflect operations at the ICT UK Paper Mill Deeside facility, albeit at this time accreditation to ISO14001 is not planned.

2.1.3 The EMS will include plans and procedures to minimise risks to the environment from the operations at the facility and will include an accident management plan, records, reviews and site closure plan. The EMS will also include a climate change risk assessment.

2.2 Operations and Maintenance

2.2.1 ICT will identify the operations and activities that are associated with significant environmental aspects at the site and will ensure that such operations and activities, including maintenance, will be carried out under specified conditions in order to reduce the significance of the identified aspects. Management systems and procedures will be developed which cover:

- operation of the paper making process and ancillary plant;
- maintenance of equipment;
- waste handling and storage;
- spill contingency; and
- start-up and shutdown.

2.2.2 Procedures will not only cover normal operation but will also address abnormal operation, including start-up and shutdown.

2.2.3 Planned maintenance routines will be established to ensure all key plant components which have the potential to affect the environmental performance of the facility remain in good working order. Maintenance procedures will be informed by manufacturers recommended inspection and maintenance regimes, good industry practice and/or other regulatory requirements.

2.2.4 Daily inspections of all plant with the potential to impact on the environment will be undertaken and recorded.

2.3 Competence and Training

2.3.1 ICT will provide operator training to ensure the facility is managed and operated by a fully trained workforce. Training will not only address normal operations but will also include those actions required in the event of abnormal operations and emergencies.

2.3.2 A training policy and training plans will be in place for all staff roles at the facility, these will include specific training relevant to the environmental permit and operation of the facility in accordance with documented procedures that will have been developed to minimise risk to the environment. Training records for all staff are kept demonstrating competency.

[6] https://www.gov.uk/guidance/develop-a-management-system-environmental-permits

2.3.3 Job specifications will be defined and will include details on relevant qualifications and training (including where relevant on the job training) required for that role.

2.3.4 All relevant staff (including contractors) will be made aware of the requirements of the permit, in particular those conditions in relation to emission limits and notification procedures. A copy of the permit will be available for reference within the Control Room.

2.3.5 Procedures will also be in place to ensure that contractors undertaking work at the installation are qualified for the task they are undertaking.

2.4 Organisation

2.4.1 An organogram for the installation is not yet available. Prior to the operation of the facility, an organogram will be provided. The organogram will show roles and responsibilities for the permitted activities and will be clearly defined within the management system.

2.5 Accident Management

2.5.1 An Accident Management Plan (AMP) will be established prior to commencing operation of the proposed installation. The AMP will detail those actions required in the event of an emergency or accident/incident. This will include small incidents such as minor spills and leaks and complaints, as well as major incidents such as fire and major spills. In particular, a system for recording and allocating appropriate follow-up for accidents, incidents and non-conformances will be established prior to operation.

2.5.2 To support this application, an initial Environmental Risk Assessment (ERA) is provided in Appendix C, which includes an assessment of potential accident risks. This will be reviewed prior to commencing operation and maintained as part of the AMP throughout the operational life of the installation.

2.5.3 As part of the design process, hazards will be identified and reviewed with a view to minimising safety, health and environmental risks.

2.6 Site Security

2.6.1 The site will be provided with external CCTV system consisting of several cameras which are installed along the buildings perimeter with the scope to have a continuous full view and control above the external areas of the site (internal roads, parking areas, access gates, etc.).

2.6.2 The CCTV system will be continuously monitored (24/7) by a Security Guards service. The Security Guard service and the monitoring central of the CCTV system will be placed in a specific office placed in the Gatehouse building.

2.7 Energy Efficiency

2.7.1 The following section provides information on energy consumption and basic energy efficiency measures, for the installation. The gas turbine has an efficiency of 33% and the boilers have an efficiency of 96 to 98%.

Basic Energy Requirements

2.7.2 Table 2.1 below provides a breakdown of the energy requirements of the installation:

Table 2.1: Energy Consumption by Source

Energy Source	Annual Energy Consumption	
	Delivered	Primary
Natural Gas	230 GWh	230 GWh
Electricity	73.3 GWh	70.8 GWh
Heat	See Figure 2.2	See Figure 2.2
Other (Diesel for Emergency Generator)	Very Low	Very Low

2.7.3 The facility consumes approximately 66,000 MWh / year of electricity, a breakdown of this consumption is detailed in the energy balance diagram in Appendix H.

2.7.4 The heat consumption for the facility is detailed in the heat balance flow diagram in Appendix H.

2.7.5 Relative to the nature and scale of the site the following basic energy saving measures will be incorporated into the operating procedures:

- The site energy usage will be measured and monitored. Annual electricity and gas usage will be recorded; and
- When selecting new plant and equipment, improvements to building performance etc energy performance will form a key factor in the selection process.

2.7.6 Basic energy saving techniques will be employed at the facility, these will include:

- Use of low energy equipment where practicable such as energy efficient vacuum systems for dewatering and energy efficient lighting;
- High efficiency electrical motors, pumps and agitators;
- `Switch off` policies;
- Energy efficient motors;
- Insulation of pipework where possible; and
- Preventative maintenance schedule for relevant plant.

2.7.7 As part of the site EMS, an energy efficiency plan will be produced which will include the following:

- Energy management policy;
- Monitoring and targeting;
- Specific energy consumption;
- Operating and maintenance procedures to reduce energy consumption;
- Energy efficiency measures/techniques; and
- Review of energy / materials consumption per tonne of paper produced

2.7.8 Details of energy and heat usage can be found in the energy and process spreadsheet included in Appendix H.

2.8 Efficient Use of Raw Materials

2.8.1 The main raw material requirements for the facility will be pulp, water and gas for powering the CHP plant and other combustion units. Table 2 2 provides details of raw materials, expected usage, storage and description of how the raw material is used.

2.8.2 Safety data sheets for chemicals in use can be found in Appendix I.

2.8.3 Types and amounts of raw materials can be found in Table 2.2 below:

Table 2.2: Raw Materials Inventory

Raw Material	Composition	Amount Stored (aggregated) & Storage Details	Expected Usage (tonnes per year)	Usage of Raw Material	Environmental Effects
Paper Mill					
Pulp	100% Cellulose	• Phase 1 - 6226 tonnes • Phase 2 ï 7080 tonnes • Phase 3 - 7080 tonnes	• Phase 1 ï 70,000 tonnes • Phase 2 ï 140,000 tonnes • Phase 3 ï 210,000 tonnes	Raw material for tissue production	No significant effect
Coating chemicals (Marecoat A598 and Marerelease R250 SDS)	Marecoat - Polymers in aqueous solution (Hexanedionic acid, polymer with chloro-methyloxirane and N-(2-aminoethyl)-1,2-ethanediamine,, Polyethyleneimine) Marerelease - Mix of non hazardous Polyol Esters	• Phase 1 ï 20 tonnes • Phase 2 ï 40 tonnes • Phase 3 ï 60 tonnes 20 x 1m^3 bulk containers (IBCs)	• Phase 1 ï 116 tonnes • Phase 2 ï 232 tonnes • Phase 3 ï 348 tonnes	Yankee coating	Marecoat - H412 Harmful to aquatic life with long lasting effects. Marerelease ï None listed
Talc	100% talc (clay mineral, composed of hydrated magnesium silicate)	• Phase 1 ï 25 tonnes • Phase 2 ï 50 tonnes • Phase 3 ï 75 tonnes Stored in 25 x 1 tonne bags on pallets	• Phase 1 ï 280 tonnes • Phase 2 ï 560 tonnes • Phase 3 ï 840 tonnes	Pitch control	No significant effect
Antiscale (TR SC 100 SDS)	Contains 2-Phosphonobutane-1,2,4-tricarboxylic acid	• Phase 1 - 2 tonnes • Phase 2 ï 4 tonnes • Phase 3 - 6 tonnes 2 x 1m^3 bulk containers (IBCs)	• Phase 1 ï 3.5 tonnes • Phase 2 ï 7 tonnes • Phase 3 -10.5 tonnes	Used in the process as Antiscale for the heat exchangers or vacuum system.	No significant effect
Microbiological treatment (FennoSpec 7810 and FennoCide Quat 40 SDS)	FennoSpec ï formic acid and sulphuric acid FennoCide - Didecyldimethylammonium chloride	• Phase 1 - 4 tonnes • Phase 2 ï 8 tonnes • Phase 3 ï 12 tonnes 4 x 1m^3 bulk containers (IBC) or 2.5m^3 tank	• Phase 1 - 47 tonnes • Phase 2 ï 94 tonnes • Phase 3 ï 141 tonnes	Biological control for incoming water	Fennocide: H400 ï Very toxic to aquatic life. Fennocide: H411 ï Toxic to aquatic life with long lasting effects. Fennospec ï No significant effect

Raw Material	Composition	Amount Stored (aggregated) & Storage Details	Expected Usage (tonnes per year)	Usage of Raw Material	Environmental Effects
Charge control (SYCONTROL P 90 SDS)	Contains 1,2-Ethanediamine, polymer with (chloromethyl)oxirane and N-methylmethanamine	• Phase 1 - 2 tonnes • Phase 2 ï 4 tonnes • Phase 3 - 6 tonnes 2 x 1m^3 bulk container (IBC)	• Phase 1 - 18 tonnes • Phase 2 ï 36 tonnes • Phase 3 - 54 tonnes	Isoelectrical potential control	H412: Harmful to aquatic life with long lasting effects
Anti-foam (Defoam P62 SDS)	Contains alcohols (C14-18, ethoxylated propoxylated)	• Phase 1 ï 1 tonne • Phase 2 ï 2 tonnes • Phase 3 ï 3 tonnes 1 x 1m^3 bulk container (IBC)	• Phase 1 - 2 tonnes • Phase 2 ï 4 tonnes • Phase 3 ï 6 tonnes	Antifoaming agent	H413: May cause long lasting harmful effects to aquatic life.
Acids	75% Phosphoric acid (H_3PO_4) solution; 78% Sulphuric Acid (H_2SO_4) solution;	• Phase 1 - 5 tonnes • Phase 2 ï 5 tonnes • Phase 3 ï 10 tonnes 5m^3 tank	• Phase 1 - 4 tonnes • Phase 2 ï 8 tonnes • Phase 3 ï 12 tonnes	pH Control	No significant effect
Sodium hydroxide	NaOH (0.5M)	• Phase 1 - 5 tonnes • Phase 2 ï 10 tonnes • Phase 3 -15 tonnes 5m^3 tank	• Phase 1 ï 6.5 tonnes • Phase 2 ï 13 tonnes • Phase 3 -19.5 tonnes	pH Control	H402: Harmful to aquatic life
Colouring additives (Pergasol Green & Pergasol Red SDS)	Direct Dye (Pergasol Green contains mixture of: 5-chloro-2-methyl-4-isothiazolin-3-one [EC no.247- 500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)) (Pergasol Red contains Hexasodium 4,4'-[1,4-phenylenebis[imino(6-chloro-1,3,5-triazine-4,2-diyl)imino]]bis[5-hydroxy-6-[(2-sulphonatophenyl)azo]napht	• Phase 1 - 3 tonnes • Phase 2 ï 6 tonnes • Phase 3 - 9 tonnes 3 x 1m^3 bulk container (IBC)	• Phase 1 - 5 tonnes • Phase 2 ï 10 tonnes • Phase 3 ï 15 tonnes	Production of Coloured Paper	Pergasol Green - No significant effect Pergasol Red: H400 ï Very toxic to aquatic life. H410 - Very toxic to aquatic life with long lasting effects

Raw Material	Composition	Amount Stored (aggregated) & Storage Details	Expected Usage (tonnes per year)	Usage of Raw Material	Environmental Effects
	halene and mixture of: 5-chloro-2-methyl-4-isothiazolin-3-one [EC no.247- 500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)				
Lubricating grease (MSDS_958899)	Grease (contains napthenic acids, zinc salts and zinc dialkyl dithiophosphate)	• Phase 1 ï 0.05 tonnes • Phase 2 ï 0.05 tonnes • Phase 3 ï 0.1 tonnes	• Phase 1 ï 0.1 tonnes • Phase 2 ï 0.15 tonnes • Phase 3 ï 2 tonnes	Grease for lubricating all the necessary components	H401 ï Toxic to aquatic life H411 - Toxic to aquatic life with long lasting effects.
Lubricating oil (MSDS_743619)	Gear oil (contains amines, C12-14-tert-alkyl and long chain alkenyl amine)	• Phase 1 ï 0.2 tonnes • Phase 2 ï 0.4 tonnes • Phase 3 ï 0.4 tonnes	• Phase 1 ï 0.2 tonnes • Phase 2 ï 0.4 tonnes • Phase 3 ï 0.6 tonnes	Oil for lubricating all the necessary components	H400 ï Very toxic to aquatic life. H410 - Very toxic to aquatic life with long lasting effects
Wet strength resin (Kymene 217LXE SDS)	Contains Hexanedioic acid, polymer with N1-(2-aminoethyl)-1,2-ethanediamine and 2-(Chloromethyl)oxirane (>= 15 - < 25%)	• Phase 1 - 70 tonnes • Phase 2 ï 140 tonnes • Phase 3 -210 tonnes 2 x 35m^3 tank. Tank for chemicals are equipped with a bund and double skinned. They are equipped with level indicators and alarm.	• Phase 1 - 700 tonnes • Phase 2 ï 1400 tonnes • Phase 3 -2100 tonnes To give wet resistant to the paper		H412 - Harmful to aquatic life with long lasting effects.
Dry strength resin	To be confirmed	• Phase 1 - 50 tonnes • Phase 2 ï 100 tonnes • Phase 3 ï 150 tonnes 2 x 25m^3 tank. Tanks for chemicals are equipped with a bund and double skinned. They are equipped with level indicators and alarm.	• Phase 1 - 700 tonnes • Phase 2 ï 1400 tonnes • Phase 3 ï 2100 tonnes To increase paper tensile		To be confirmed

Raw Material	Composition	Amount Stored (aggregated) & Storage Details	Expected Usage (tonnes per year)	Usage of Raw Material	Environmental Effects
Converting					
Core Glue (Aquence FB 5000 SDS)	Vinyl glue - Water based adhesive comprising polyvinyl acetate. Contains 1,2-Benzisothiazol-3(2H)-one; Isothiazolinone mixture 3:1 (CIT/MIT).	• Phase 1 - 15 tonnes • Phase 2 ï 15 tonnes • Phase 3 - 30 tonnes	• Phase 1 - 190 tonnes • Phase 2 ï 284 tonnes • Phase 3 - 379 tonnes	Glue to produce cardboard core on Toilette and Kitchen lines.	H400 ï Very toxic to aquatic life. H411 ï Toxic to aquatic life with long lasting effects.
Pickup Glue	Vinyl glue	• Phase 1 - 7 tonnes • Phase 2 ï 7 tonnes • Phase 3 ï 12 tonnes	• Phase 1 - 72 tonnes • Phase 2 ï 108 tonnes • Phase 3 ï 144 tonnes	Glue for pickup paper on core	H411 ï Toxic to aquatic life with long lasting effects.
Laminated Glue (Marebond B 1000 SDS)	Vinyl glue ï contains 5-Chloro-2-Methyl-2H-Isolthiazol-3-one and 2-Methyl-2H-Isothiazol-3-one (3:1)	• Phase 1 - 4 tonnes • Phase 2 ï 4 tonnes • Phase 3 ï 7 tonnes	• Phase 1 ï 39.6 tonnes • Phase 2 ï 59.4 tonnes • Phase 3 ï 79.2 tonnes	Glue to laminate paper plies	H400 ï Very toxic to aquatic life. H410 - Very toxic to aquatic life with long lasting effects
Tail Tie	Vinyl glue	• Phase 1 - 7 tonnes • Phase 2 ï 7 tonnes • Phase 3 -12 tonnes	• Phase 1 - 72 tonnes • Phase 2 ï 108 tonnes • Phase 3 -144 tonnes	Glue to close the last sheet on the roll	H411 ï Toxic to aquatic life with long lasting effects.
Inks	Water based	• Phase 1 - 6 tonnes • Phase 2 ï 6 tonnes • Phase 3 - 10 tonnes	• Phase 1 ï 93.6 tonnes • Phase 2 ï 140.4 tonnes • Phase 3 ï 187.2 tonnes	Inks for printing the draws on tissue paper	No significant effect
Fragrance (FGR13193 SDS)	Mix including: • 30%-40% Eucalyptol • 3%-5% L-Menthol • 1%-3% trans-menthone • 0.5% - 1% Oxacyclohexadec an-2-One • 0.5% - 1% (ethoxymethoxy) cyclododecane • 0.25%-0.5% Camphene	• Phase 1 - tonnes • Phase 2 ï tonnes • Phase 3 - tonnes	• Phase 1 ï 4.8 tonnes • Phase 2 ï 7.2 tonnes • Phase 3 ï 9.6 tonnes	Fragrance to apply on core for perfumed tissue items	H400 ï Very toxic to aquatic life. H410 - Very toxic to aquatic life with long lasting effects H411 ï Toxic to aquatic life with long lasting effects.

Raw Material	Composition	Amount Stored (aggregated) & Storage Details	Expected Usage (tonnes per year)	Usage of Raw Material	Environmental Effects
	• 0.25%-0.5% cis-5-Methyl-2-(1-methylethyl) cyclohexanone • 0.25%-0.5% Tetrahydrolinalool • 0.1%-0.25% alpha cedrene • 0.1%-0.25% 1-methoxy-4-(1-propenyl) benzene • 0.1%-0.25% linalyl acetate • 0.1%-0.25% (1-Methyl-2-(1,2, 2-trimethylbicyclo[3.1.0]-hex-3-ylmethyl) cyclopropyl) methanol				
Wax for core machine	Wax	• Phase 1 ï 0.8 tonnes • Phase 2 ï 0.8 tonnes • Phase 3 ï 1.2 tonnes	• Phase 1 ï 3.5 tonnes • Phase 2 ï 5.3 tonnes • Phase 3 ï 7 tonnes	wax to lubricate the cardboard strip	No significant effect
Lubricating grease (MSDS_958899)	Grease (contains napthenic acids, zinc salts and zinc dialkyl dithiophosphate)	• Phase 1 ï 0.08 tonnes • Phase 2 ï 0.08 tonnes • Phase 3 ï 0.12 tonnes	• Phase 1 ï 0.1 tonnes • Phase 2 ï 0.15 tonnes • Phase 3 ï 0.2 tonnes	Grease for lubricating all the necessary components	H401 ï Toxic to aquatic life H411 - Toxic to aquatic life with long lasting effects.
Lubricating oil (MSDS_743619)	Gear oil (contains amines, C12-14-tert-alkyl and long chain alkenyl amine)	• Phase 1 ï 0.8 tonnes • Phase 2 ï 0.8 tonnes • Phase 3 ï 1.5 tonnes Oil is usually stored in 200 litre drum within a bund	• Phase 1 ï 18 tonnes • Phase 2 ï 27 tonnes • Phase 3 ï 36 tonnes	Oil for lubricating all the necessary components	H400 ï Very toxic to aquatic life. H410 - Very toxic to aquatic life with long lasting effects
Water Treatment Plant					
Water Treatment Plant nutrients	Carbon; Urea; Ac. Phosphoric	• Phase 1 ï 3 tonnes • Phase 2 ï 3 tonnes • Phase 3 ï 3 tonnes	• Phase 1 ï 2 tonnes • Phase 2 ï 4 tonnes • Phase 3 ï 6 tonnes	To permit the grow of bacteria to oxidize the COD/BOD in MBBR	No significant effect

Raw Material	Composition	Amount Stored (aggregated) & Storage Details	Expected Usage (tonnes per year)	Usage of Raw Material	Environmental Effects
		Stored in individual bags or bulk IBC			
Water Treatment Plant flocculants (TR PC 5440 SDS)	Contains Hydrocarbons, C12-C15, N-alkanes, isoalkanes, cyclics, <2% aromatics	• Phase 1 ï 2 tonnes • Phase 2 ï 4 tonnes • Phase 3 ï 4 tonnes Stored in individual bags or bulk IBC	• Phase 1 ï 3 tonnes • Phase 2 ï 6 tonnes • Phase 3 ï 9 tonnes	To increase buoyancy of sludge and fibres	No significant effect
CHP, Boilers and Steam Generation					
Natural Gas	mainly CH_4	Not applicable ï supplied by mains pipeline	• Phase 1 ï 230 GWh • Phase 2 ï 460 GWh • Phase 3 ï 690 GWh	CHP; Burners; Steam Generator	Flammable

2.8.4 In addition to the raw materials detailed above, there will also be number of a packaging material such as carboard for boxes, polyethylene films etc.

2.9 Water Usage

2.9.1 Water is supplied directly through a pipework connection to mains water. The manufacturing process requires 5184 m^3 of water per phase per day.

2.9.2 Water is used in the process to generate steam to heat parts of the process as well as being mixed with the pulp at the start of the process to create the stock.

2.9.3 Water balance diagrams can be found in Appendix H

2.10 Avoidance, Recovery and Disposal of Wastes

2.10.1 Operational waste will be managed through an Operational Waste Management Plan (OWMP) which will be produced prior to the operation of the facility.

2.10.2 Table 2.2 below lists the predicted waste streams from the site along with their expected volume per annum. These are estimates based on the current information available.

Table 2.3: Waste Streams

Description	Source	Expected Amount – Phase 1 (tpa)	Expected Amount – with Phase 2 (tpa)	Expected Amount – with Phase 3 (tpa)
Plant/facility areas cleaning	General waste from housekeeping	100	150	180
Metallic wires	Cellulose pulp bales	140	280	420
Sludges	Paper mill effluent treatment	90	180	270
Empty containers (e.g. 1,000l IBC tanks, barrels, can)	Raw/auxiliary liquid material (-some containing residues);	400 IBCs (+ some barrels/cans)	600 IBCs (+ some barrels/cans)	800 IBCs (+ some barrels/cans)
Jumbo roll cores	Jumbo rolls	50	100	150
Packaging (cardboard and plastic)	Converting rolls	100	100	150
Pallets, crates	Multiple Sources	40	60	70
Aqueous liquids containing ink and/or sealants or adhesives	Washing converter machine equipment	240	360	480
Replaced paper machine felts and/or webs	Paper machines	1	2	3
Oils	Machinery	1	1.5	2
Oily rags/wiping cloths, filter materials	Cleaning	2	4	6
Discarded metallic equipment or other metals	Carpentry/maintenance activities	10-20	20-40	30-60
Dust	Air dust removal system	25	38	50

2.10.3 The permit requirements in relation to waste minimisation will be complied with and the operator will aim to minimise raw material consumption and therefore minimise the generation of waste.

2.10.4 Annual reviews of waste production along with manufactured paper volumes will be undertaken. Annual targets will be implemented, these will include targets for waste produced per tonne of paper manufactured which will be reviewed over time where efficiency improvements are identified.

2.10.5 Waste will be minimised through the adoption of the following:

- Ensure that paper goods leaving the Proposed Development are packaged using material that is fit for purpose (e.g. correct material and sizing) to minimise waste from damaged goods;
- Avoid overproduction/over-ordering as excess stock could remain unsold for longer periods of time (which could lead to deterioration of materials);
- Provide adequate storage for equipment and any materials to reduce damage;
- Where possible, substitute hazardous materials for less hazardous alternatives.
- Select suppliers with take-back packaging;
- Re-use pallets;

2.10.6 The potential opportunities to recycle/recover paper sludge material are influenced by the chemical and physical characteristics of the material. Appropriate dewatering techniques will be used to remove as much water as practicable from the paper sludge material. Other opportunities to increase the potential recycling/recovery possibilities of the sludge material (by modifying the process/input materials/treatment process) will be investigated.

Waste Storage and Collection

2.10.7 Waste will be stored within dedicated areas within secure storage areas within the facility. These will be situated on impermeable surfaces with sealed drainage and designed to allow the easy segregation and storage of waste. All waste storage areas will be clearly labelled to identify all wastes and ensure that no non-compatible waste is stored together or allow mixing of different waste types.

2.10.8 Wood, plastic, iron/steel, cardboard, etc will be stored in specific containers each of approx. 20 m^3 volume (roll on / roll off containers). Liquid wastes will be in a movable tank with a self-bunded containment system.

3 SITE OPERATIONS

3.1 Overview of the Installation

3.1.1 The paper mill is to be built over three phases.

3.1.2 Phase 1 will comprise pulp storage, bale handling, paper manufacture hall, jumbo rolls storage, converting area, raw materials storage, high bale warehouse, dispatch, water treatment plant, chemical storage and CHP.

3.1.3 Phase 2 will comprise pulp storage, bale handling, paper manufacture hall, jumbo rolls storage, and CHP.

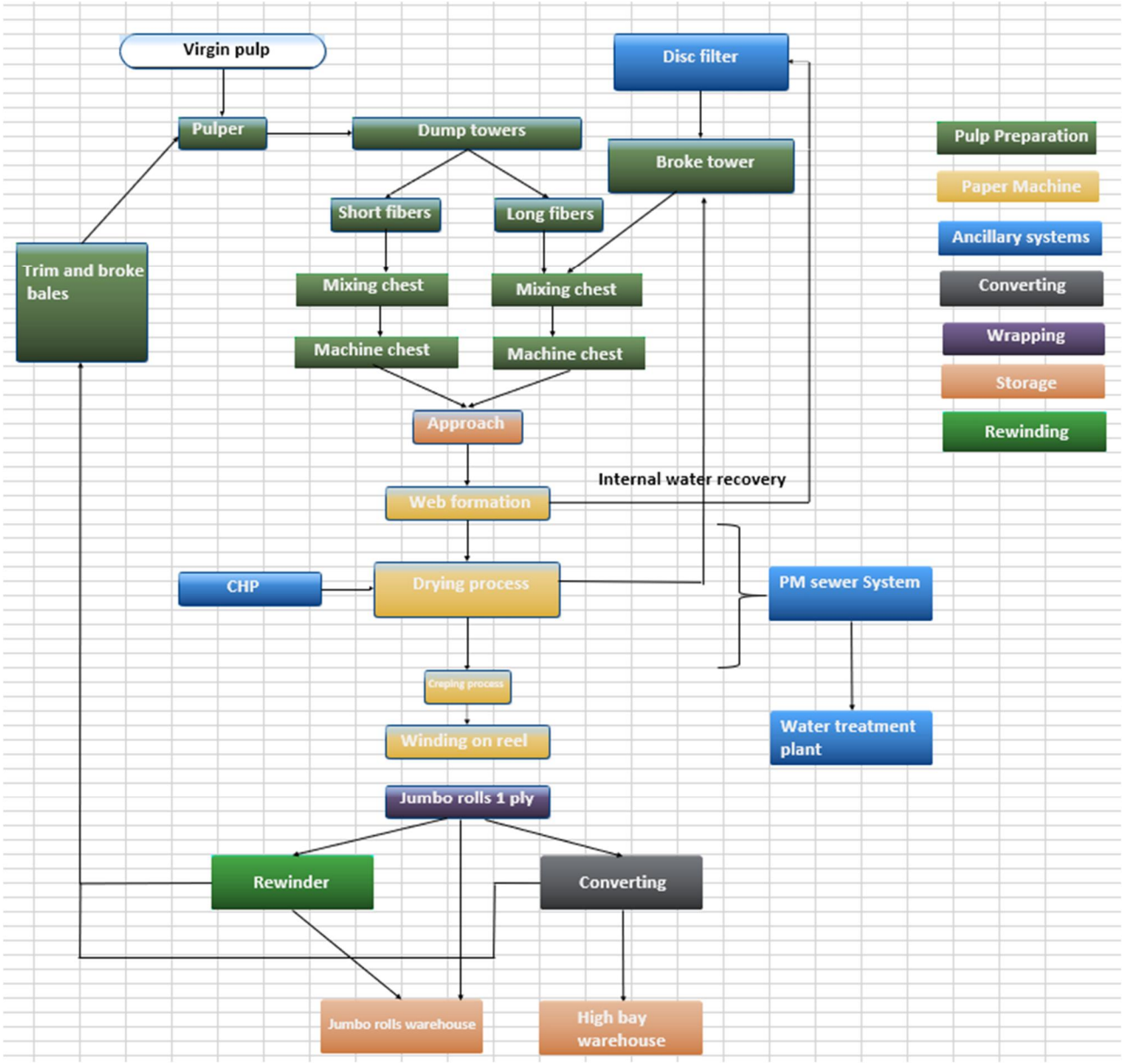
3.1.4 Phase 3 will comprise pulp storage, bale handling, paper manufacture hall, jumbo rolls storage, converting area, high bale warehouse and CHP.

3.1.5 Plans showing the phasing developments and site layouts can be found in Appendix B.

3.2 Site Activities

3.2.1 The tissue paper making process to be undertaken at the installation is detailed in the process flow diagram in figure 3.1 below:

Figure 3.1: ICT Process Flow



Production Cycle and Manufacturing Process

3.2.2 This section provides a general description of how the Paper Mill functions, including the production and manufacturing cycle for tissue paper, outlining the process of each stage of the production cycle that is undertaken within each component part of the Facility.

3.2.3 The production of tissue paper products will consist of the following stages:

- Raw materials storage
- Pulp preparation
- Web formation
- Web drying
- Winding the web into reels
- Wrapping
- Rewinding

Raw Materials Storage

3.2.4 Pulp will be delivered to the facility are sheets of cellulose packed as bales and bound by straps or metal wire. The pulp is stored in the pulp storage warehouse which is an enclosed building at ambient conditions to preserve the quality of the pulp.

3.2.5 Chemicals used within the paper making process and for boiler water treatment are stored within dedicated chemical storage areas adjacent to the paper manufacturing halls.

Pulp Preparation Stage

3.2.6 Within the pulp storage warehouse, the cellulose bales are transported using forklifts, placed on the conveyor belts and moved through to the bale handling warehouse.

3.2.7 The cellulose bales are added to the pulper, and fresh / recovery water is added. Fresh water is added, to minimize the consumption, only in a few points: dilution of the chemicals, cooling water system, and as make-up of the internal water system.

3.2.8 The main amount of water come from the drainage and pressing of the tissue web from the paper machine. The recovery water come from the disc filter where water is recovered from the paper making machine and fibres removed from the water. This water is filtered in the disc filter and then used in the pulping process and in other several points (consistency control for instance).

3.2.9 Further details can be seen in the water balance diagram included in Appendix H. The pulper is used to turn the bales of cellulose into pulp with a 7-8% dry matter content; it consists of an almost conical-bottomed tank with a rotor equipped with blades placed at the base. Subsequently, the pulp is pumped to storage tanks,

Pulp Treatment

3.2.10 The fibrous suspension coming from the pulper is sent to dump towers and from these to a series of machines that separate any small debris (screens), others dedicated to mechanical processing, activating the fibres that favour the formation of a web with the desired mechanical characteristics (refiners), and others dedicated to breaking up any clumps (deflakers). From these machines, the stock is sent to the mixing chests and subsequently to the machine chests through dedicated pumps. The machine chests feed the tissue machine where web formation and drying will take place.

3.2.11 The impurities present in the incoming pulp mixture are discharged into a small duct below the machine and pumped to the water treatment plant.

Paper Making Machine

3.2.12 The pulp is pumped from the dump towers, it is diluted (to about 0.02% dry matter content) and sent to the flow box section of the paper machine.

3.2.13 In the flow box, the pulp mixture is introduced between felt and wire sections onto the forming cylinder of the paper machine. Two separate roller sets separately move the wire and felt sections. As the pulp mixture is pressed between the felt and wire it forms a wet sheet of paper (paper web) on the felt (circa 10% dry matter). Water drains through the wire or is absorbed into the felt.

3.2.14 The water drained through the wire is reused in the production cycle (white-water circuit), while the wet sheet formed over it is transferred to the drying section by means of the felt. The drying section of the paper machine includes presses and the Yankee dryer. The white-water circuit is a separate circuit from the pulp.

3.2.15 The mechanical action of felt pressing, carried out between the press(s) and the Yankee dryer, increases the dry matter content of the pulp (up to about 40-43%) and causes the paper sheet to attach to the Yankee dryer. The hot yankee (steam) and hot air from hoods increase the dry matter from 40-43% to 95%

3.2.16 Steam provides the heat to the surface of the Yankee dryer. The Yankee dryer rotates and moves the paper sheet beneath the hot air generated by the hoods, which, combined with the heating action of the surface of the Yankee dryer itself.

3.2.17 The Yankee hood is divided into two sections, a dry and a wet section. The two sections promote the circulation of hot air using a series of fans on the external surface of the paper, and simultaneously removes wet steam coming from the drying process which is returned to the heat exchanger and condensed. Both sections of the hood are equipped with a blade-type blowing system to prevent loss of hot air from the extremities of the hood toward the machine room.

3.2.18 The air emitted by the hood is heated by two gas burners to heat the air for drying. To optimise the process, the plant is equipped with a heat recovery system through heat exchanger dedicated to heating the air to the drying system.

3.2.19 The Yankee Hood raises the dry matter content of the pulp to about 95%. At this point the paper sheet, still on the Yankee dryer cylinder is tissue paper. The creped structure of the tissue paper is achieved when the paper sheet is scraped away from the drying cylinder using a steel blade. The tissue paper sheet is detached from the Yankee dryer, checked by using infrared or X-ray devices and wound onto jumbo reels and wrapped in polyethylene film.

3.2.20 Forklifts are used to handle the finished reels, where they are stored, one on top of another, in the jumbo reels warehouse.

Multi-ply paper formation

3.2.21 This production process takes the jumbo reels of paper produced in the paper mill and converts these, into tissue products comprising, toilet rolls, kitchen towels, napkins, handkerchiefs, facial tissues and industrial rolls.

3.2.22 The formation of multi-ply reels is performed by means of machines called winders. The parent reels are transferred by forklift truck from the jumbo reels warehouse to the converting machines, or to a machine called a rewinder, located in a dedicated room where they are unwound and rewound, coupling one or more plies together and then, if needed, cut to size through circular blades.

3.2.23 There are two types of converting lines that produce rolled product lines (toilet or kitchen rolls) or folded product lines (napkins or handkerchiefs), which both require operation of a separate sequence of machines as follows:

Table 3.1: Machines Sequence

Rolled Product Line Sequence of Machines	Folded Product Line Sequence of Machines
Corewinder ï produces cardboard tubes.	Folding machine ï produces table napkins or handkerchiefs. Basically, it unwinds the paper, prints it, embosses it, and through suction rolls or folding rolls, creates the napkins or the handkerchiefs.
Rewinder ï winds the tissue paper roll (or log) around the tube	Wrapper ï creates the finished product, collects together the napkins or handkerchiefs with the printed polyethylene film that constitutes the external packaging of the pack.
Accumulator ï collects the log and sends them to the log saw	Case packer ï creates the cardboard box containing the finished product packs
Log saw ï using a blade, cuts the logs, producing rolls and a portion of waste called a ñtrimò Paper trim is reused in the paper mill.	Palletiser - a system of robots that handle the bundles, depositing them on wooden pallets
Wrapper ï this packages the finished product, wrapping the rolls coming from the log saw with the printed polyethylene film that constitutes the packaging.	Bander - applies stretch filming on the pallet containing the finished product
Bundler ï creates a bundle containing several packs of the product	Labelling machine ï applies self-adhesive labels to the finished products pallets
Palletiser ï a system of robots that handle the bundles, depositing them on wooden pallets	-
Bander ï applies stretch filming on the pallet containing the finished product	-
Labelling machine ï applies self-adhesive labels to the finished products pallets	-

3.2.24 There will be several converting lines installed at the site. Phase 1 will include eight lines and Phase 3 will include eight lines.

Combined Heat and Power (CHP) Supply

3.2.25 The CHP system for each paper machine comprises the following:

- 24.16 MW gas turbine/combustor unit
- Two 6.8 MW burners to supply heat to the Yankee hood
- 9.8 mw and 4.8mw burners to provide steam to the Yankee cylinder

3.2.26 Nominally heat and power to the paper making process is provided by the gas turbine/combustor unit. When the gas turbine/combustor unit is not in operation, heat to the process is provided by one or both boiler burners to the Yankee hood. These are on-line burners installed in the blowing ducts or corner burners with heat combustion chambers.

3.2.27 In addition to these, one of the boilers may also operate to provide steam to Yankee cylinder.

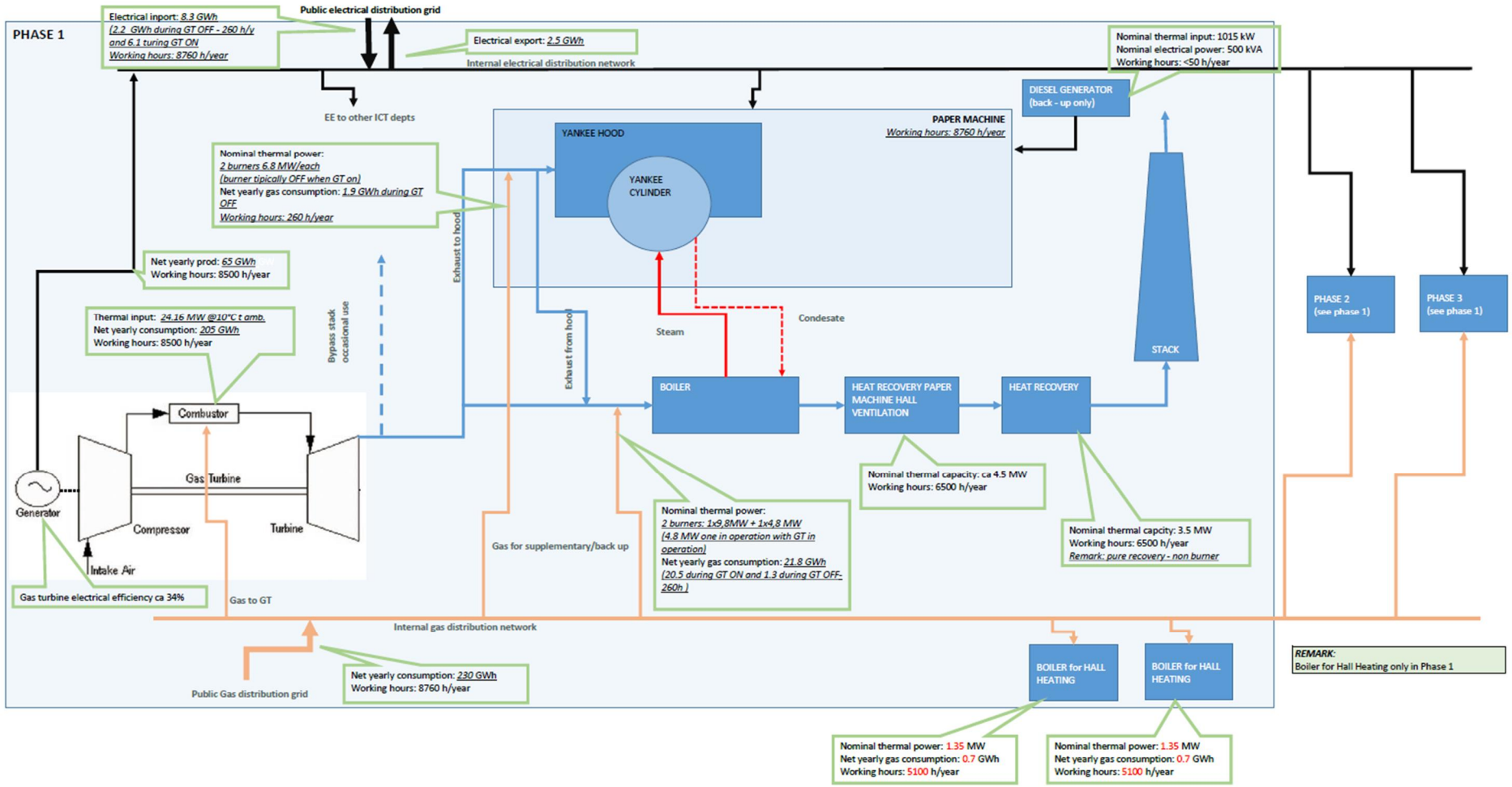
3.2.28 In addition to the CHP described above, a heat recovery system will be installed. The heat recovery system takes heat from the Yankee cylinder and heats the water circuit for heating the paper mill, warehouse and converting buildings. In addition to the heat recovery, additional heating is provided by the boilers as required.

3.2.29 After the heat recovery system, the exhaust will be directed to the main stack.

3.2.30 An emergency backup generator will be included in phase 1. This will be used mainly to power critical systems, but in case of unexpected shut down it can power equipment for a safely shut down.

3.2.31 The CHP system is illustrated in figure 3.2 below and included in Appendix J. This shows the systems to be installed for each phase of the installation, however, phase 2 will not include the additional boilers (2 x 1.35 MW) for providing additional heating.

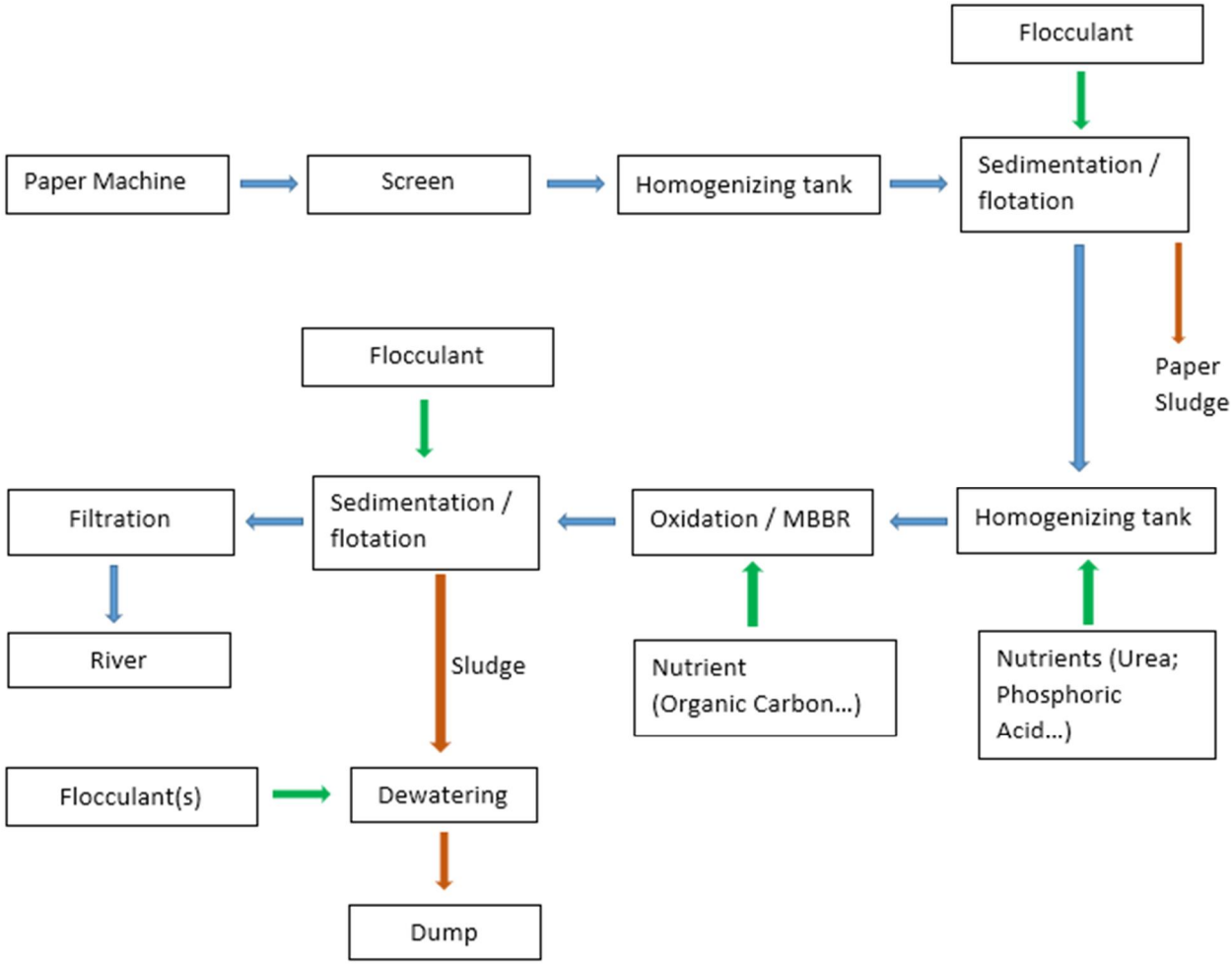
Figure 3.2: CHP System



Wastewater Treatment Plant

3.2.32 The WTP comprises both primary (physico-chemical) and secondary (biological) treatment as shown in figure 3.4 below:

Figure 3.3: Wastewater Treatment Process



Primary Treatment (physico-chemical)

3.2.33 The Wastewater Treatment Plant is located within a building detached from the main facility. Wastewater from the paper machine will be discharged by pumps through a screen and into the first homogenizing tank. Submersed agitators will be installed inside the homogenising tank in order to assure a good mixing of the wastewater.

3.2.34 Following the homogenising tank, water will be pumped to the sedimentation / flotation tank where the wastewater will be treated through either a flocculation system or a sedimentation system to remove fine solids. These solids are anticipated to be composed of small fibres from the production process.

3.2.35 Fibres will either float or sediment according to the technology chosen. In the case of air flotation chemicals (flocculants) are added. Sludge generated during the above-mentioned treatment falls by gravity into the sludge tank.

3.2.36 The final design will confirm whether or not sedimentation or flotation technology is to be used, however, at this point in time it is anticipated that the flotation system will be installed.

3.2.37 Wastewater is sent to a second homogenising tank where pH will be controlled through dosing with phosphoric acid, to ensure correct performance of the biological treatment, which is sensitive to extreme pH values.

Secondary Treatment (Biological)

3.2.38 Finally, treated wastewater will flow by gravity to the biological treatment process. A biological activated sludge treatment or a Moving Bed Biofilm Reactor (MBBR) is required to achieve the waste water quality needed to discharge directly to surface water. The proposed technology provides biological oxidation, which in the presence of oxygen, oxidises contaminants reducing the values of COD (Chemical Oxygen Demand) and BOD (Biological Oxygen Demand) within the wastewater.

3.2.39 A blower system provides the air to the MBBR. The air flow is controlled automatically with an oximeter and frequency converter.

3.2.40 After the biological reaction the mixed liquid is sent by pumps to the final flotation or sedimentation unit for clarification, to separate biological sludge from clarified wastewater.

3.2.41 The clarified wastewater is discharged by gravity into the treated wastewater tank, or filtered if necessary, and will then be discharged from a single outfall to the Dee estuary.

Sludge Management

3.2.42 Sludge from the sedimentation / flotation tank (biological system) as well as the paper sludge produced in the primary treatment stage are sent to sludge storage tanks. The sludge storage tanks include agitators to keep the sludge well homogenized and to avoid settlement. Sludge dewatering will be included to remove excess water from the sludge, albeit the equipment to be used for this stage will not be confirmed until the detailed design stage. To achieve higher dryness in the sludge, a dosage of cationic/anionic polyelectrolyte could be needed, again this will be determined via the detailed design stage. The dewatered sludge will then be discharged into a sludge container located in the waste storage area prior to removal from site.

3.2.43 Water separated during the sludge dewatering will be pumped to the homogenization tank to be recirculated through the treatment process again.

3.3 Process Controls

3.3.1 Automatic control systems will be installed to monitor the production process to ensure that that the plant operates as designed. These systems will include alarms to alert the Operator to a potential issue and with set points established to alarm before it happens to allow time for corrective actions.

3.3.2 Operators will be appropriately trained to manage any issues and understand the actions required to minimise impacts to the environment.

3.4 Commissioning

3.4.1 A commissioning plan will be developed for the installation to outline the commissioning and associated monitoring activities and will be agreed with NRW prior to any commissioning activities taking place.

4 EMISSIONS AND MONITORING

4.1 Point Source Emissions to Air

4.1.1 Point source emissions to air will comprise emissions from the combustion units and the dust removal systems.

4.1.2 The locations of these emissions points are illustrated on the emissions plan included in Appendix B. The stacks are designated release points A1 ï A35.

4.1.3 Point source emissions to air are detailed in Table 4.1 below alongside details on emission limits, emissions monitoring and proposed monitoring methods:

Table 4.1: Point Source Emissions to Air

Emission Point Reference	Source	Release Point Grid Reference	Parameter	Emission Limit	Monitoring Frequency	Monitoring Standard or Method
			Phase 1			
A1 (Reference CV1/E1 on emissions point plan)	Methane gas boiler (Boiler for hall heating)	332377,369851	Oxides of Nitrogen (NO_x)	100 mg/Nm^3	Annually	BS EN 14792
			Carbon monoxide (CO)	-	Continuous	BS EN 14181
			Pressure, temperature, oxygen and water vapour	-	Continuous	BS EN 14181
A2 (Reference CV1/E2 on emissions point plan)	Methane gas boiler (Boiler for hall heating)	332375,369855	Oxides of Nitrogen (NO_x)	100 mg/Nm^3	Annually	BS EN 14792
			Carbon monoxide (CO)	-	Continuous	BS EN 14181
			Pressure, temperature, oxygen and water vapour	-	Continuous	BS EN 14181
A3 (Reference CV1/E12 on emissions point plan)	Trimming Press	332212,369880	Particulate matter	-	Six Monthly	BS EN 13284
A4 (Reference CV1/E4 on emissions point plan)	Dust Removal System 1	332350,369871	Particulate matter	-	Six Monthly	BS EN 13284
A5 (Reference CV1/E5 on emissions point plan)	Dust Removal System 2	332318,369848	Particulate matter	-	Six Monthly	BS EN 13284
A6 (Reference CV1/E6 on emissions point plan)	Dust Removal System3	332286,369826	Particulate matter	-	Six Monthly	BS EN 13284
A7 (Reference CV1/E7 on emissions point plan)	Dust Removal System 4	332252,369805	Particulate matter	-	Six Monthly	BS EN 13284
A8	Dust Removal System 5	332280,369902	Particulate matter	-	Six Monthly	BS EN 13284

Emission Point Reference	Source	Release Point Grid Reference	Parameter	Emission Limit	Monitoring Frequency	Monitoring Standard or Method
(Reference CV1/E8 on emissions point plan)						
A9 (Reference CV1/E9 on emissions point plan)	Dust Removal System 6	332248,369879	Particulate matter	-	Six Monthly	BS EN 13284
A10 (Reference CV1/E10 on emissions point plan)	Dust Removal System 7	332215,369857	Particulate matter	-	Six Monthly	BS EN 13284
A11 (Reference CV1/E11 on emissions point plan)	Dust Removal System 8	332183,369834	Particulate matter	-	Six Monthly	BS EN 13284
A12 (Reference PM1/E3 on emissions point plan)	CHP By-pass	332055,369786	Oxides of Nitrogen (NO_x)	50 mg/Nm^3	Annually	BS EN 14792
			Carbon monoxide (CO)	-	Continuous	BS EN 14181
			Pressure, temperature, oxygen and water vapour	-	Continuous	BS EN 14181
A13 (Reference PM1/E10 on emissions point plan)	CHP Main Stack	332020,369755	Oxides of Nitrogen (NO_x)	50 mg/Nm^3	Annually	BS EN 14792
			Carbon monoxide (CO)	-	Continuous	BS EN 14181
			Pressure, temperature, oxygen and water vapour	-	Continuous	BS EN 14181
A14 (Reference PM1/E15 on emissions point plan)	Dust Removal System 9	332063, 369776	Particulate matter	-	Six Monthly	BS EN 13284
A15 (Reference PM1/E16 on emissions point plan)	Trimming Silos	332022,369739	Particulate matter	-	Six Monthly	BS EN 13284
A16 (Reference RW1/E36 on emissions point plan)	Dust Removal System 10	332065,369816	Particulate matter	-	Six Monthly	BS EN 13284
Phase 2						

Emission Point Reference	Source	Release Point Grid Reference	Parameter	Emission Limit	Monitoring Frequency	Monitoring Standard or Method
A17 (Reference PM2/E3 on emissions point plan)	CHP By-pass	332132,369676	Oxides of Nitrogen (NO_x)	50 mg/Nm^3	Annually	BS EN 14792
			Carbon monoxide (CO)	-	Continuous	BS EN 14181
			Pressure, temperature, oxygen and water vapour	-	Continuous	BS EN 14181
A18 (Reference PM2/E10 on emissions point plan)	CHP Main Stack	332090,369653	Oxides of Nitrogen (NO_x)	50 mg/Nm^3	Annually	BS EN 14792
			Carbon monoxide (CO)	-	Continuous	BS EN 14181
			Pressure, temperature, oxygen and water vapour	-	Continuous	BS EN 14181
A19 (Reference PM2/E15 on emissions point plan)	Dust Removal System	332125, 369688	Particulate matter	-	Six Monthly	BS EN 13284
A20 (Reference PM2/E16 on emissions point plan)	Trimming Silos	332085,369593	Particulate matter	-	Six Monthly	BS EN 13284
Phase 3						
A21 (Reference CV3/E1 on emissions point plan)	Methane gas boiler (Boiler for hall heating)	332425,369778	Oxides of Nitrogen (NO_x)	100 mg/Nm^3	Annually	BS EN 14792
			Carbon monoxide (CO)	-	Continuous	BS EN 14181
			Pressure, temperature, oxygen and water vapour	-	Continuous	BS EN 14181
A22 (Reference CV3/E2 on emissions point plan)	Methane gas boiler (Boiler for hall heating)	332423, 369781	Oxides of Nitrogen (NO_x)	100 mg/Nm^3	Annually	BS EN 14792
			Carbon monoxide (CO)	-	Continuous	BS EN 14181
			Pressure, temperature, oxygen and water vapour	-	Continuous	BS EN 14181

Emission Point Reference	Source	Release Point Grid Reference	Parameter	Emission Limit	Monitoring Frequency	Monitoring Standard or Method
A23 (Reference CV3/E4 on emissions point plan)	Dust Removal System 11	332409,369788	Particulate matter	-	Six Monthly	BS EN 13284
A24 (Reference CV3/E5 on emissions point plan)	Dust Removal System 12	332376,369765	Particulate matter	-	Six Monthly	BS EN 13284
A25 (Reference CV3/E6 on emissions point plan)	Dust Removal System 13	332344,369742	Particulate matter	-	Six Monthly	BS EN 13284
A26 (Reference CV3/E7 on emissions point plan)	Dust Removal System 14	332311,369721	Particulate matter		Six Monthly	BS EN 13284
A27 (Reference CV3/E8 on emissions point plan)	Dust Removal System 15	332339,369818	Particulate matter	-	Six Monthly	BS EN 13284
A28 (Reference CV3/E9 on emissions point plan)	Dust Removal System 16	332306,369796	Particulate matter	-	Six Monthly	BS EN 13284
A29 (Reference CV3/E10 on emissions point plan)	Dust Removal System 17	332274,369773	Particulate matter	-	Six Monthly	BS EN 13284
A30 (Reference CV3/E11 on emissions point plan)	Dust Removal System 18	332241,369751	Particulate matter	-	Six Monthly	BS EN 13284
A31 (Reference CV3/E12 on emissions point plan)	Trimming Press	332332,369880	Particulate matter	-	Six Monthly	BS EN 13284
A32 (Reference PM3/E3 on emissions point plan)	CHP By-pass	332143,369660	Oxides of Nitrogen (NO_x)	50 mg/Nm^3	Annually	BS EN 14792
			Carbon monoxide (CO)	-	Continuous	BS EN 14181
			Pressure, temperature, oxygen and water vapour	-	Continuous	BS EN 14181

Emission Point Reference	Source	Release Point Grid Reference	Parameter	Emission Limit	Monitoring Frequency	Monitoring Standard or Method
A33 (Reference PM3/E10 on emissions point plan)	CHP Main Stack	332108,369628	Oxides of Nitrogen (NO_x)	50 mg/Nm^3	Annually	BS EN 14792
			Carbon monoxide (CO)	-	Continuous	BS EN 14181
			Pressure, temperature, oxygen and water vapour	-	Continuous	BS EN 14181
A34 (Reference PM3/E15 on emissions point plan)	Dust Removal System	332152,369650	Particulate matter	-	Six Monthly	BS EN 13284
A35 (Reference PM3/E16 on emissions point plan)	Trimming Silos	332085,369593	Particulate matter	-	Six Monthly	BS EN 13284

4.1.4 Emissions of NOx are controlled using low NOx burners. Dust abatement is provided using bag filters and wet scrubbers.

4.2 Point Source Emissions to Surface Water (Other than Sewers)

4.2.1 The WTP at the facility will treat all process effluent produced by the paper making activity as detailed in section 3.2.

4.2.2 Following treatment, the clarified effluent is discharged by gravity into the treated water tank, or filtered if necessary, and will be discharged from a single outfall to the Dee estuary. The location for the discharge to the Dee estuary currently being considered is understood to be at National Grid Reference (NGR): 331835, 368995.

4.2.3 Site surface water will be managed through a series of Swales and SuDs which will take all clean, uncontaminated water from the site and discharge at 5 outfalls as shown in the emissions points plan in Appendix B.

4.2.4 Point source emissions to surface water (other than sewers) are detailed in Table 4.2 below:

Table 4.2: Point Source Emissions to Water (Other than Sewers)

Emission Point Reference	Source	Parameter	Emission Limit	Monitoring Frequency	Monitoring Standard or Method
W1	Treated Process Effluent	pH	6-9	Continuous	Standard pH Sensor
		Biological Oxygen Demand (BOD)	25 mg/l	Weekly	BS EN 1899-1
		Chemical oxygen demand (COD)	-	Daily	BS 6068- 2.34:1998
			1.5 kg/t	Yearly average	-
		Total suspended solids (TSS)	0.35 kg/t	Yearly average	-
		Total nitrogen	-	Weekly	BS EN ISO 11905-1:1998, BS 6068- 2.62:1998
			0.15 for tissue paper kg/t	Yearly average	-
		Total phosphorus	-	Weekly	BS EN ISO 15681-1:2004, BS6068-2.86:2003
			0.003 ï 0.012 kg/t	Yearly average	-
		Adsorbable organically bound halogens (AOX)	-	Once every 2 months	EN ISO 9562:2004
				Yearly average	As agreed in writing with NRW
		Temperature	Maximum Temperature 30ºC	Continuous	Standard Temperature Sensor
		Flow Rate	60 litres/second	Continuous	MCERTS Self-Monitoring of Effluent Flow Scheme
		Maximum Daily Volume	4,563 m^3/day	Continuous	MCERTS Self-Monitoring of Effluent Flow Scheme

Emission Point Reference	Source	Parameter	Emission Limit	Monitoring Frequency	Monitoring Standard or Method
		Metals ï Zn, Cu, As, Cd, Pb, Ni, Total and dissolved	-	Annually	Method in accordance with EA monitoring discharges to water guidance[7]
W2	Clean, uncontaminated surface water	-	-	-	-
W3	Clean, uncontaminated surface water	-	-	-	-
W4	Clean, uncontaminated surface water	-	-	-	-
W5	Clean, uncontaminated surface water	-	-	-	-
W6	Clean, uncontaminated surface water	-	-	-	-

[7] https://www.gov.uk/government/collections/monitoring-discharges-to-water-environmental-permits

4.2.5 Continuous emissions monitors on the discharge to the Dee Estuary will be included to monitor the following:

- pH
- Temperature
- Flow; and
- Volume

4.3 Point Source Emissions to Sewers, Effluent Treatment Plants or Other Transfers off Site

4.3.1 There will be no point source emissions to sewers, effluent treatment plants or other transfers off site from the permitted activities at the facility,

4.4 Point Source Emissions to Land

4.4.1 There will be no point source emissions to land from the permitted activities at the facility,

4.5 Fugitive Emissions

4.5.1 The potential fugitive emissions from the site are surface water run-off, leaks and spillages from external storage areas, dust, and VOCs from oil/diesel storage.

4.5.2 Procedures will be put in place as part of the environmental management system for the facility to minimise the risk of fugitive emissions from the site.

4.6 Odour

4.6.1 Potentially odorous activities, such as the wastewater treatment plant, are to be located on the opposite site of the site to the sensitive receptors, with tall buildings located in between. There will be embedded mitigation in place at the wastewater treatment plant, such as closed primary and biological sludge tanks, deodorised with activated carbon which will be installed on the vent of the biological sludge tank.

4.7 Noise and Vibration

4.7.1 Most of the operational processes will be undertaken within a building which will provide attenuation of any off-site noise from the installation. Several the stack/chimney emissions sources will be fitted with noise abatement in the form of silencers to minimise potential for noise nuisance. The operation with the highest sound power level will be from the Phase 1 trimming silo with a level of 91 dBA.

4.8 Monitoring and Reporting of Emissions

4.8.1 Sampling ports for the emissions monitoring will meet the requirements of the EA technical guidance note (TGN) M1[8] Sampling requirements for stack emission monitoring guidance.

[8] https://www.gov.uk/government/publications/m1-sampling-requirements-for-stack-emission-monitoring

4.8.2 An appropriate periodic monitoring technique and standard for monitoring stack emissions to air will be followed as detailed in EA guidance monitoring stack emissions: techniques and standards for periodic monitoring[9].

4.8.3 Monitoring of the discharge to the Dee Estuary from the water treatment plant will be undertaken following the requirements detailed in the environmental permit. This will include the installation of continuous emissions monitors (CEMs) for applicable parameters. CEMs will be calibrated, serviced and maintained following manufacturers recommendations.

4.8.4 A monitoring procedure will be put in place prior to operation of the facility.

4.9 CHP Ready Assessment

4.9.1 Under Article 14 of the Energy Efficiency Directive (2012/27/EU) (EED), operators of certain types of combustion installations are required to undertake an assessment of opportunities for combined heat and power (CHP) or supplying a district heating or cooling network.

4.9.2 The proposed ICT paper mill is a new facility that exceeds the threshold of a 14 5(a) type installation, having a net thermal input of more than 20 MW, and is therefore required carry out an assessment of CHP opportunities.

4.9.3 The CHP units will operate in CHP mode from the onset and have been sized to meet the heat and power demands of the paper mill itself with any excess electricity exported to the national grid as detailed in the diagram in Appendix J. Any excess heat from the paper production is used for heating other on site buildings. Therefore, there is no additional capacity to supply heat or power to other facilities. During the pre-application discussions with NRW it was agreed that a CHP ready assessment and cost benefit assessment does not need to be undertaken for the facility. Confirmation of this can be found in the email from Stuart Ross (NRW) included in Appendix K.

[9] https://www.gov.uk/government/publications/monitoring-stack-emissions-techniques-and-standards-for-periodic-monitoring

5 ENVIRONMENTAL IMPACTS

5.1.1 To support this application several environmental assessments have been performed. The full details of these assessments are appended to this application and a reference to the full assessment is given where relevant for the environmental issues detailed below.

5.2 Emissions to Air

5.2.1 An assessment of the emissions to air has been undertaken using the Environment Agency H1 screening tool. NO_x and particulate emissions did not screen out as insignificant and therefore further air quality modelling of emissions to air has been undertaken.

5.2.2 The air quality assessment and screening assessments can be found in Appendix E.

Combustion Emissions

5.2.3 For each phase of the development the stacks associated with the combustion plant have the following heights:

- CHP Main Stack ï 30m
- CHP By-pass ï 30m
- Methane Gas Boilers ï 12.5m

5.2.4 Sensitivity testing of stack heights has been carried out for the gas turbines for all phases. Due to the size and hours of operation these are the on-site combustion source with maximum potential for impact on operational emissions. The results of flue height sensitivity testing accounting for the combined operational impact of all combustion plant and operational traffic are listed in the air quality assessment.

5.2.5 An assessment was undertaken for the operational combustion plant emissions with an increased flue height of 30m for the main and by-pass units. Based on the predicted process contributions (PC) and total concentration or predicted environmental concentrations (PEC) for on-site combustion plant associated with Phase 1 only or Phases 1,2 and 3, impacts are predicted to be negligible at all residential and ecological receptors. With the embedded mitigation of increased flue height of 30m for the main and by-pass units the impact of the on-site combustion plant has therefore been assessed as insignificant.

5.2.6 Diesel generators are to be used for emergency back-up power and have not been included in the modelling assessment as it is anticipated that they will operate for less than 50 hours per year.

5.2.7 Overall, the impact of the Proposed Development is considered Negligible with regards to cumulative emissions of NO_2 and particulate matter and the overall effect is considered not significant.

Particulate Emissions

5.2.8 This includes dust removal systems, trimming presses and trimming silos which all produce dust emissions. For each of the Phases 1, 2 and 3, there will be dust removal systems (E15) and trimming silos (E16). There will also be two sets of dust removal systems (E4-E11) and trimming presses (E12) to be installed as part of the Phase 1 and Phase 3 designs, and also a dust removal system (E36), to be installed as part of Phase 1 only.

5.2.9 The dust removal systems E15 and E36 are to have wet scrubbers and the remaining units listed are to have dry filters.

Long-term PM_{10} concentrations

5.2.10 The majority of PCs are also below 1% of the EAL, excluding the PCs for receptors 10 and 12 for Phases 1, 2 and 3, which are slightly above 1% of the EAL (4µg/m^3). However, all of the predicted PECs are well below the EAL (40µg/m^3).

5.2.11 The impact of the on-site dust emitting processes on long-term PM_{10} concentrations is therefore considered to be insignificant.

Short-term PM_{10} Concentrations

5.2.12 All of the predicted short-term PECs are well below the short-term EAL (50µg/m^3), with a maximum of 36.5µg/m^3 predicted at receptor 12 based on all phases operating and wet scrubbers only achieving 5mg/m^3. The impact of the on-site dust emitting processes on short-term PM_{10} concentrations is therefore considered to be insignificant.

5.3 Assessment of Impacts at Ecological Receptors

5.3.1 Predicted total annual mean NOx concentrations at receptor locations within the ecological sites in the area (15km buffer) are all below the limit value (30µg/m^3). A maximum total concentration of 28.1µg/m^3 was predicted at location 39, which is within Halkyn Common and Holywell Grasslands SAC, located 12km to the north-east from the Application Site. The process contribution at this site is <0.1µg/m^3, and therefore the operational combustion plant is having a negligible impact on NO_x concentrations, with existing background concentrations being the main source. The maximum change relative to the air quality objective (AQO) is 1.0% at receptors within the River Dee SAC/SSSI. As the % changes at all locations are not >1% a negligible impact is predicted at all ecological receptors. The impact of the operation of the Application Site all ecological features can therefore be screened out as insignificant.

5.4 Emissions to Water and Sewer

5.4.1 An assessment of the impact of the discharge from the WTP on the Dee Estuary has been undertaken and is included as Appendix F. The assessment has:

- Defined the expected water quality of the proposed paper mill trade discharge;
- Characterised the existing water quality of the Dee Estuary local to the proposed discharge point from the paper mill and evaluated its current Water Framework Directive (WFD) status; and
- Applied the H1 surface water pollution risk assessment screening tests for estuaries and coastal waters[10].

5.4.2 Following the three stages of H1 screening tests, the majority of parameters in the proposed discharge are screened out.

5.4.3 Three metals are not screened out at Test 3. However, there are only very marginal exceedances of the background concentrations plus 10% EQS thresholds. Most of the measured discharge concentrations of these metals at the proxy site were below the limit of detection, therefore the values applied in the tests are an overestimation of their likely average discharge concentrations. Also, the assessment has been undertaken for a Q95 river flow condition.

5.4.4 When taking these factors into account, it is concluded that, even during low tide and low river flow conditions, the proposed paper mill discharge would not result in unacceptable water quality impacts within the receiving water.

[10] https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit

5.5 Fugitive Emissions

5.5.1 Fugitive emissions are assessed in the environmental risk assessment in Appendix C. This details the potential emissions and management controls in place. The risk from fugitive emissions is considered to be low.

5.6 Odour

5.6.1 A qualitative odour screening assessment has been undertaken as part of the planning application for the facility.

5.6.2 The risk of odour from the facility been concluded to be insignificant. Further details are included in the environmental risk assessment in Appendix C.

5.7 Noise and Vibration

5.7.1 A noise and vibration assessment has been undertaken as part of the planning application for the facility. The finding of the screening assessment concluded that the facility will not have any significant impacts on sensitive receptors. A copy of this assessment can be found in Appendix G.

6 BEST AVAILABLE TECHNIQUES (BAT) ASSESSMENT

6.1.1 This section contains a review against the BAT requirements detailed in Best Available Techniques (BAT) Reference Document for the Production of Pulp, Paper and Board[11].

[11] https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/PP_revised_BREF_2015.pdf

6.2 Assessment Against the Best Available Techniques (BAT) Conclusions from the BAT Reference Document for the Production of Pulp, Paper and Board

6.2.1 The BAT assessment can be found in Table 6.1 below:

Table 6.1: Assessment of BAT Conclusions Requirements

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
General BAT conclusions for the pulp and paper industry			
Environmental management system:			
1	In order to improve the overall environmental performance of plants for the production of pulp, paper and board, BAT is to implement and adhere to an environmental management system (EMS) as follows: (a) - commitment of the management, including senior management; (b) definition of an environmental policy that includes the continuous improvement of the installation by the management; (c) planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment; (d) implementation of procedures paying particular attention to: (i) structure and responsibility (ii) training, awareness and competence (iii) communication (iv) employee involvement (v) documentation (vi) efficient process control (vii) maintenance programmes (viii) emergency preparedness and response	The Operator has ISO14001 accredited existing Environmental Management Systems (EMS) for its other paper mill sites to direct the operation of permitted process operations. The EMS will adapted to reflect operations at the ICT UK Paper Mill facility. The EMS will identify: ÅThe risks that the activities pose to the environment are identified; ÅThe measures that are required to minimise the risks are identified; ÅThe activities are managed in accordance with the management system; ÅPerformance against the management system is audited at regular intervals; and ÅThe environmental permit is complied with. Procedures will be put in place for the regular inspection and maintenance of plant, equipment, storage areas and	Compliant by the time the facility starts to operate ï EMS systems and procedures will be put in place prior to the operation of the facility.

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	(ix) safeguarding compliance with environmental legislation; (e) checking performance and taking corrective action, paying particular attention to: (i) monitoring and measurement (see also the Reference Document on the General Principles of Monitoring) (ii) corrective and preventive action (iii) maintenance of records (iv) independent (where practicable) internal and external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained; (f) review of the EMS and its continuing suitability, adequacy and effectiveness by senior management; (g) following the development of cleaner technologies; (h) consideration for the environmental impacts from the eventual decommissioning of the installation at the stage of designing a new plant, and throughout its operating life; (i) application of sectoral benchmarking on a regular basis.	associated infrastructure including site surfacing, drainage systems and containment systems. Before commencing operations under the permit, the site operators will be trained in the safe operation of plant and emergency procedures. The management system will be reviewed at least once every four years or in response to significant changes to the activities, or in the event of accidents or other non-compliances. Once drafted, the EMS will meet all for the BATC requirements.	
Materials management and good housekeeping:			
2	BAT is to apply the principles of good housekeeping for minimising the environmental impact of the production process a - Careful selection and control of chemicals and additives b - Input-output analysis with a chemical inventory, including quantities and toxicological properties c - Minimise the use of chemicals to the minimum level required by the quality specifications of the final product d - Avoid the use of harmful substances (e.g. nonylphenol ethoxylate-containing dispersion or cleaning agents or surfactants) and substitution by less harmful alternatives	a. ICT has a number of paper production facilities across Europe using standard operating processes and chemicals assessed for the production of paper. All chemicals and additives are carefully selected to ensure that the requirements of the operation and process productions are met minimising the use of chemicals and additives where possible. b. A chemical inventory and safety data sheets for chemicals used	Compliant by the time the facility starts to operate ï EMS systems and procedures will be put in place prior to the operation of the facility and will include spill management procedures. Design phase will consider other aspects.

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	e - Minimise the input of substances into the soil by leakage, aerial deposition and the inappropriate storage of raw materials, products or residues f - Establish a spill management programme and extend the containment of relevant sources, thus preventing the contamination of soil and groundwater g - Proper design of the piping and storage systems to keep the surfaces clean and to reduce the need for washing and cleaning	within the process is included as part of this application (see Table 2.1). Usage quantities are included in Table 2.1 ï Raw Materials c. Standard production processes are to be used which have been adopted from other ICT sites across Europe. This ensures that all processes have been quality checked to ensure a consistent final product which minimises the use of chemicals where possible to achieve the desired final product. d. All chemicals to be used at the site have been assessed and adopted from existing processes from other ICT sites. e. All chemicals and raw materials storage areas are on impermeable surfacing and sealed drainage to minimise the risk of fugitive emissions which may contaminate soils etc. at the facility. Dusts are managed through dust removal systems with bag filter or wet scrubber abatement. f. A spill management procedure will be produced as part of the site EMS prior to the operation of the facility. g. The detailed design phase will ensure that design of the piping and storage systems will keep the surfaces clean and reduce the need for washing and cleaning.	

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
3	In order to reduce the release of not readily biodegradable organic chelating agents such as EDTA or DTPA from peroxide bleaching, BAT is to use a combination of the techniques given.	No chelating agent or peroxide bleaching will be used in the plant	Not Applicable
Water and wastewater management:			
4	In order to reduce the generation and the pollution load of wastewater from wood storage and preparation, BAT is to use a combination of the techniques given	n/a ï there will be no wood storage at the facility.	Not Applicable
5	In order to reduce freshwater use and generation of waste water, BAT is to close the water system to the degree technically feasible in line with the pulp and paper grade manufactured by using a combination of the techniques given a) Monitoring and optimising water usage b) Evaluation of water recirculation options c) Balancing the degree of closure of water circuits and potential drawbacks; adding additional equipment if necessary d) Separation of less contaminated sealing water from pumps for vacuum generation and reuse e) Separation of clean cooling water from contaminated process water and reuse f) Reusing process water to substitute for fresh water (water recirculation and closing of water loops) g) In-line treatment of (parts of) process water to improve water quality to allow for recirculation or reuse	a. Water usage will be monitored and optimised as part of process controls. Annual assessments will ensure that water optimisation is considered and year on year improvements are made where possible. Procedures will be included as part of the site EMS. Water usage will be optimised through the design to ensure it is minimised where possible. b. Water recirculation will be included as detailed in the water balance (Appendix H) with internal water recovery being provided through the disc filter. c. This will be considered as part of the detailed design phase, incorporating the operational water use and wastewater treatment where applicable. d. Not applicable, since blowers do not require sealing water. e. This will be considered as part of the detailed design phase and clean cooling water will be separated from contaminated water where possible as detailed	Compliant by the time the facility starts to operate

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
		in the water balance in Appendix H. The cooling water system is an independent circuit which will never have a direct contact with hot fluids, since the cooling effect is obtained by plate heat exchangers. f. This will be considered as part of the design phase and process water will be reused where possible as detailed in the water balance in Appendix H. g. Water recirculation will be included as detailed in the water balance (Appendix H) with internal water recovery being provided through the disc filter.	
Energy consumption and efficiency:			
6	In order to reduce fuel and energy consumption in pulp and paper mills, BAT is to use technique (a) and a combination of the techniques given a) Use an energy management system that includes all of the following features: i. Assessment of the mill's overall energy consumption and production ii. Locating, quantifying and optimising the potentials for energy recovery iii. Monitoring and safeguarding the optimised situation for energy consumption b) Recover energy by incinerating those wastes and residues from the production of pulp and paper that have high organic content and calorific value, taking into account BAT 12 (Only applicable if the recycling or reuse of wastes and residues from the production of pulp and paper with a high organic content and high calorific value is not possible)	a. ICT will look to establish an energy management system as part of the site EMS. Other ICT sites are accredited to ISO50001 and ICT will look to achieve this accreditation for the proposed facility. b. n/a ï there is no waste to be generated from the facility that will be sent for incineration. Waste will be sent for recovery or recycling where possible. c. The site will have CHP systems installed. d. Excess heat from the CHP units will be used for heating etc. where possible. e. Thermo compressors will be used.	Compliant by the time the facility starts to operate.

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	c) Cover the steam and power demand of the production processes as far as possible by the cogeneration of heat and power (CHP) d) Use excess heat for the drying of biomass and sludge, to heat boiler feedwater and process water, to heat buildings, etc. e) Use thermo compressors (Applicable to both new and existing plants for all grades of paper and for coating machines, as long as medium pressure steam is available f) Insulate steam and condensate pipe fittings g) Use energy efficient vacuum systems for dewatering h) Use high efficiency electrical motors, pumps and agitators i) Use frequency inverters for fans, compressors and pumps j) Match steam pressure levels with actual pressure needs	f. All pipework will be appropriately insulated to minimise energy loss. g. Energy efficient vacuum systems for dewatering will be used. h. High efficiency electrical motors, pumps and agitators will be used. i. Frequency inverters for fans, compressors and pumps will be used at the facility where applicable. j. The plant will be designed so as to ensure that steam pressure levels match with actual pressure needs	
Emissions of odour:			
7	In order to prevent and reduce the emission of odorous compounds originating from the wastewater system, BAT is to use a combination of the techniques given Technique I Applicable for odours related to water systems closure a) Design paper mill processes, stock and water storage tanks, pipes and chests in such a way as to avoid prolonged retention times, dead zones or areas with poor mixing in water circuits and related units, in order to avoid uncontrolled deposits and the decay and decomposition of organic and biological matter b) Use biocides, dispersants or of oxidising agents (e.g. catalytic disinfection with hydrogen peroxide) to control odour and decaying bacteria growth c) Install internal treatment processes ('kidneys') to reduce the concentrations of organic matter and consequently possible odour problems in the white water system	a. The design phase will take into account the requirements and ensure that all measures are put in place to minimise odour risks b. The design phase will consider the use of biocides, dispersants or oxidising agents to control odour and decaying bacteria growth c. Not applicable ï there will be no internal treatment processes as this is not considered relevant to the processes at the site II Applicable for odours related to wastewater treatment and sludge handling, in order to avoid conditions where wastewater or sludge becomes anaerobic	Compliant by the time the facility starts to operate.

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	If Applicable for odours related to waste water treatment and sludge handling, in order to avoid conditions where waste water or sludge becomes anaerobic a) Implement closed sewer systems with controlled vents, using chemicals in some cases to reduce the formation of and to oxidise hydrogen sulphide in sewer systems b) Avoid over-aeration in equalisation basins but maintain sufficient mixing c) Ensure sufficient aeration capacity and mixing properties in aeration tanks; revise the aeration system regularly d) Guarantee proper operation of secondary clarifier sludge collection and return sludge pumping e) Limit the retention time of sludge in sludge storages by sending the sludge continuously to the dewatering units f) Avoid the storage of wastewater in the spill basin longer than is necessary; keep the spill basin empty g) If sludge dryers are used, treatment of thermal sludge dryer vent gases by scrubbing and/or bio filtration (such as compost filters) h) Avoid air cooling towers for untreated water effluent by applying plate heat exchangers	a. Not applicable ï there are no closed sewer systems for the processes at the site. b. Processes will be automatically controlled to avoid over-aeration in equalisation basins but maintain sufficient mixing. Submersed agitators will be installed inside the homogenising tank in order to assure a good mixing of the wastewater. c. The design of the plant will ensure sufficient aeration capacity and mixing properties in aeration tanks d. Not applicable ï there will be no secondary clarifier sludge collection and return sludge pumping at the site. e. Sludge will be sent continuously to the dewatering units f. A continuous discharge from the facility is proposed which will minimise storage of wastewater in the basin for longer than necessary. Wastewater storage will consist of a 10 m^3 tank which is required to create a pump head. g. Not applicable ï sludge driers are not proposed to be used at the facility. h. Cooling water system will include plate heat exchangers.	
Monitoring of key process parameters and of emissions to water and air:			
8	*BAT is to monitor the key process parameters.* *Emissions to air:*	All required monitoring for emissions to air and water will be included at the	Compliant by the time the facility starts to operate

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	continuous monitoring of pressure, temperature, oxygen, CO and water vapour content in flue-gas for combustion processes *Emissions to water:* Continuous monitoring of flow, temperature & pH Periodic monitoring of P and N content in biomass, sludge volume index, excess ammonia and ortho-phosphate in the effluent, and microscopy checks of the biomass	facility as detailed in Tables 4.1 and 4.2.	
9	BAT is to carry out the monitoring and measurement of emissions to air, as indicated, on a regular basis with the frequency indicated and according to EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards which ensure the provision of data of an equivalent scientific quality. a) NOx and SO_2 - continuous monitoring b) Dust - Periodic or continuous c) TRS (including H_2S) - Periodic (Diffuse emissions from different sources (e.g. the fibre line, tanks, chip bins, etc.) and residual weak gases d) NH3 - Periodic (Recovery boiler equipped with SNCR	Not applicable ï There is no proposed recovery boiler to be installed at the facility. Heat and power will be supplied using gas powered CHP units.	Not Applicable
10	BAT is to carry out the monitoring and measurement of emissions to water, as indicated below, with the frequency indicated and according to EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality. a) Chemical oxygen demand (COD) or Total organic carbon (TOC) - daily b) BOD - Weekly c) Total suspended solids (TSS) - Daily d) Total nitrogen (weekly) e) Total phosphorous (weekly) f) EDTA, DTPA - monthly (Applicable where EDTA or DTPA (chelating agents) are used in the process.)	a. Monitoring will be undertaken daily when operational b. Monitoring will be undertaken weekly when operational c. Monitoring will be undertaken daily when operational d. Monitoring will be undertaken weekly when operational e. Monitoring will be undertaken weekly when operational f. Not applicable ï no EDTA or DTPA chelating agents used in the process g. Monitoring will be undertaken once every 2 months as required	Compliant by the time the facility starts to operate

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	g) AOX (according to EN ISO 9562:2004) - Once every 2 months (Not applicable to plants that provide evidence that no AOX is generated or added via chemical additives and raw materials.		
11	BAT is to regularly monitor and assess diffuse total reduced sulphur emissions from relevant sources.	Not applicable ï there will be no relevant sulphur emissions sources at the facility.	Not applicable
Waste management:			
12	In order to reduce the quantities of wastes sent for disposal, BAT is to implement a waste assessment (including waste inventories) and management system, so as to facilitate waste reuse, or failing that, waste recycling, or failing that, 'other recovery', including a combination of the techniques given a) Separate collection of different waste fractions (including separation and classification of hazardous waste) b) Merging of suitable fractions of residues to obtain mixtures that can be better utilised c) Pretreatment of process residues before reuse or recycling d) Material recovery and recycling of process residues on site e) Energy recovery on- or off-site from wastes with high organic content f) External material utilisation g) Pretreatment of waste before disposal	A waste assessment has been conducted for the site and is included as part of the ES in Appendix M. Table 2.2 identifies waste streams to be produced as part of the site operations. a. Separate collection of different waste fractions will be undertaken at the facility b. Not applicable ï there will be no residues appropriate for merging to obtain mixtures that can be better utilised at the facility c. Process residues are dewatered and screened prior to reuse (recirculation) or recycling. d. Where possible, process residues will be subject to material recovery and recycling on site through dewatering and recirculation. e. Where possible, materials with high organic content will be sent for recovery off-site. f. Not applicable ï there are no options available for external material utilisation. g. Not applicable ï there are no options for pre-treatment of waste before disposal.	Compliant by the time the facility starts to operate

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
Emissions to water:			
13	In order to reduce nutrient (nitrogen and phosphorus) emissions into receiving waters, BAT is to substitute chemical additives with high nitrogen and phosphorus contents by additives containing low nitrogen and phosphorus contents.	Not applicable ï During normal operations no additional nitrogen or phosphorous is required. Urea will be added only in case of emergency (problems with biological sludge).	Not applicable
14	In order to reduce emissions of pollutants into receiving waters, BAT is to use all of the techniques given below. a) Primary (physico-chemical) treatment b) Secondary (biological) treatment	There is a dedicated wastewater treatment facility on site. The treatment process undertaken is detailed in section 3.1 above and include both primary and secondary treatment stages.	Compliant by the time the facility starts to operate
15	When further removal of organic substances, nitrogen or phosphorus is needed, BAT is to use tertiary treatment	Not applicable ï further removal of organic substances, nitrogen or phosphorous is not required at the facility and therefore tertiary treatment is not required.	Not applicable
16	In order to reduce emissions of pollutants into receiving waters from biological wastewater treatment plants, BAT is to use all of the techniques given a) Proper design and operation of the biological treatment plant b) Regularly controlling the active biomass c) Adjustment of nutrition supply (nitrogen and phosphorus) to the actual need of the active biomass	a. The wastewater plant has been designed based upon existing treatment facilities at other ICT plants across Europe. These have been demonstrated to be effective in treatment the process effluent to the required standards to be discharged to the watercourse. b. There will be automated process controls in place to ensure that the active biomass is regularly controlled. c. There will be automated process controls in place to ensure that the nutrition supply is adjusted to the actual need to the active biomass through nutrient dosing.	Compliant by the time the facility starts to operate
Emissions of noise:			

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
17	In order to reduce the emissions of noise from pulp and paper manufacturing, BAT is to use a combination of the techniques given a. Noise reduction programme b. Strategic planning of the location of equipment, units and buildings c. Operational and management techniques in buildings containing noisy equipment d. Enclosing noisy equipment and units e. Use of low-noise equipment and noise-reducers on equipment and ducts f. Vibration insulation g. Soundproofing of buildings h. Noise abatement i. Use of larger wood-handling machines to reduce lifting and transport times and noise from logs falling onto log piles or the feed table j. Improved ways of working, e.g. releasing logs from a lower height onto the log piles or the feed table; immediate feedback of the level of noise for the workers	A noise survey and assessment has been undertaken for the facility as part of the planning application. A copy of the assessment is included as Appendix G. The assessment concludes that the proposals may have a Minor Negative impact on most of the affected sensitive receptors at this stage. Based on the sensitive criteria adopted, this is expected to result in a Minor Adverse Significance of Effect. a. Building locations and layout has been designed so main process activities are undertaken within buildings away from sensitive receptors. Embedded mitigation (i.e acoustic attenuation measures in the form of silencers / acoustic hoods) has been adopted within the design of stacks emissions. b. The design of the facility has considered the strategic planning of the location of equipment, units and buildings. All plant flues are vertically orientated. c. Operational and management techniques in buildings containing noisy equipment will be produced as part of the site EMS. Appropriate specification of façade and roof construction to provide adequate sound insulation levels will be included. d. All noisy equipment and units have been considered and is enclosed in buildings to reduce the potential for off-site noise nuisance.	Compliant by the time the facility starts to operate

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
		e. Use of low-noise equipment and noise-reducers on equipment and ducts will be considered as part of the detailed design phase. f. Vibration insulation will be considered as part of the detailed design phase where applicable, however, it is not considered that any element of the operational activities will results in significant vibration impacts. g. Soundproofing of buildings will be considered as part of the detailed design phase where applicable h. Noise abatement will be considered as part of the detailed design phase where applicable i. Not applicable ï no wood is used or stored at the facility j. Not applicable ï no wood is used or stored at the facility	
Decommissioning:			
18	In order to prevent pollution risks when decommissioning a plant, BAT is to use the general techniques given	Decommissioning will be considered as part of the detailed design phase where applicable and a decommissioning plan will be produced for the site which takes in to account all required aspects of BAT. a. Design does not include any underground tanks or pipework. b. Instructions will be produced as part of management system procedures. c. A decommissioning plan will be produced prior to site operations	Compliant by the time the facility starts to operate

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
		d. A monitoring programme for groundwater and land will be undertaken to monitor impacts of operational activities e. A site closure plan will be prepared prior to operational activities starting at the site.	
BAT 19 - 32: BAT conclusions for kraft pulping process - Not applicable as process will not be undertaken at the installation, cellulose is brought to site.			
BAT 33 - 39: BAT conclusions for the sulphite pulping process - Not applicable as process will not be undertaken at the installation, cellulose is brought to site.			
BAT 40 - 41: BAT conclusions for mechanical pulping and chemimechanical pulping - Not applicable as process will not be undertaken at the installation, cellulose is brought to site.			
BAT 42 - 46: BAT conclusions for processing paper for recycling - Not applicable as process will not be undertaken at the installation, cellulose is brought to site.			
BAT conclusions for papermaking and related processes			
Wastewater and emissions to water:			
47	In order to reduce the generation of wastewater, BAT is to use a combination of the techniques given a) Optimum design and construction of tanks and chests b) Fibre and filler recovery and treatment of white water c) Water recirculation d) Optimisation of showers in the paper machine	a. This will be considered as part of the detailed design phase and will be based on current ICT practices at other sites which are considered BAT. b. This will be considered as part of the detailed design phase and will be based on current ICT practices at other sites which are considered BAT. c. This will be considered as part of the detailed design phase and will be based on current ICT practices at other sites which are considered BAT. d. This will be considered as part of the detailed design phase and will be based on current ICT practices	Compliant by the time the facility starts to operate

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
		at other sites which are considered BAT.	
48	In order to reduce freshwater use and emissions to water from speciality paper mills, BAT is to use a combination of the techniques given a) Improvement of paper production planning (Improved planning to optimise production batch combinations and length) b) Management of water circuits to fit changes (Adjust water circuits to be able to cope with changes of paper grades, colours and chemical additives used) c) Wastewater treatment plant ready to cope with changes (Adjust wastewater treatment to be able to cope with variations of flows, low concentrations and varying types and amounts of chemical additives) d) Adjustment of the broke system and of chest capacities e) Minimisation of release of chemical additives (e.g. grease-/water proof agents) containing per- or polyfluorinated compounds or contributing to their formation (Applicable only for plants producing paper with greaseor water-repellent properties) f) Switch to low AOX-containing product aids (e.g. to substitute use of wet strength agents based on epichlorohydrin resins) (Applicable only for plants producing paper grades with high wet strength)	Not applicable ï the paper mill will not produce speciality paper.	Not applicable
49	In order to reduce emission loads of coating colours and binders which can disturb the biological wastewater treatment plant, BAT is to use techniques given a) Recovery of coating colours/recycling of pigments b) Pre-treatment of effluents which contain coating colours	Not applicable ï the facility will not apply coating (inorganic fillers). Any colour requirements are achieved using dye rather than a colour coating additive.	Not applicable
50	In order to prevent and reduce the pollution load of wastewater into receiving waters from the whole mill, BAT is	See responses above for the BAT listed.	Compliant by the time the facility starts to operate

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	to use a suitable combination of the techniques specified in BAT 13, BAT 14, BAT 15, BAT 47, BAT 48 and BAT 49	The proposed site will have a dedicated wastewater treatment facility.	
Emissions to air:			
51	In order to reduce VOC emissions from off-line or on-line coaters, BAT is to choose coating colour recipes (compositions) that reduce VOC emissions.	Not applicable ï the facility will not undertake any colour coating	Not applicable
Waste generation:			
52	In order to minimise the amount of solid waste to be disposed of, BAT is to prevent waste generation and to carry out recycling operations by the use of a combination of the techniques given a) Fibre and filler recovery and treatment of white water b) Broke recirculation system (Broke from different locations /phases of papermaking process is collected, repulped and returned to the fibre feedstock) c) Recovery of coating colours/recycling of pigments d) Reuse of fibre sludge from primary wastewater treatment (Sludge with a high fibre content from the primary treatment of wastewater can be reutilised in a production process)	The paper making process includes a dedicated wastewater treatment facility. a. The wastewater treatment facility will undertake fibre and filler recovery and treatment of white water through recirculation via the disc filter. b. The facility will include broke recirculation system. This will be included as part of the detailed design phase. c. Not applicable ï facility will not include colour coating or use of pigments. Any colour requirements will be achieved using dye. d. Sludge will not be reused.	Compliant by the time the facility starts to operate
Energy consumption and efficiency:			
53	In order to reduce the consumption of thermal and electrical energy, BAT is to use a combination of the techniques given a) Energy saving screening techniques (optimised rotor design, screens and screen operation) (Applicable to new mills or major refurbishments) b) Best practice refining with heat recovery from the refiners	a. Energy saving screening techniques will be considered as part of the detailed design phase b. Best practice refining will be considered as part of the detailed design phase, however, no heat recovery from the refiners is currently proposed as the size and energy use of the refiners is low.	Compliant by the time the facility starts to operate

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	c) Optimised dewatering in the press section of paper machine/wide nip press (Not applicable to tissue paper and many speciality papers grades) d) Steam condensate recovery and use of efficient exhaust air heat recovery systems Generally applicable e) Reduction of direct use of steam by careful process integration using e.g. pinch analysis f) High efficient refiners (Applicable to new plants) g) Optimisation of the operating mode in existing refiners (e.g. reduction of no load power requirements) h) Optimised pumping design, variable speed drive control for pumps, gearless drives i) Cutting edge refining technologies j) Steam box heating of the paper web to improve the drainage properties/dewatering capacity (Not applicable to tissue paper and many speciality papers grades) k) Optimised vacuum system (e.g. turbo fans instead of water ring pumps) l) Generation optimisation and distribution network maintenance m) Optimisation of heat recovery, air system, insulation n) Use of high efficient motors (EFF1) o) Preheating of shower water with a heat exchanger p) Use of waste heat for sludge drying or upgrading of dewatered biomass q) Heat recovery from axial blowers (if used) for the supply air of the drying hood r) Heat recovery of exhaust air from the Yankee hood with a trickling tower s) Heat recovery from the infrared exhaust hot air	c. Not applicable ï facility will be producing tissue paper d. Steam condensate recovery and use of efficient exhaust air heat recovery systems will be included as part of the detailed design phase e. Not applicable ï there are no options to include direct use of steam in the process f. High efficient refiners will be included as part of the detailed design phase g. Optimisation of the operating mode in existing refiners will be considered as part of the detailed design phase h. Optimised pumping design, variable speed drive control for pumps, gearless drives will be included as part of the detailed design phase i. Cutting edge refining technologies will be included as part of the detailed design phase j. This is only partially applicable to the manufacture of tissue paper and where applicable will be considered as part of the detailed design phase k. Optimised vacuum system will be included as part of the detailed design phase l. Generation optimisation and distribution network maintenance will be considered in the detailed design phase	

BAT Number	Summary of BAT Conclusions Requirements	Operator Evidence of Compliance	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
		m. Optimisation of heat recovery, air system, insulation will be considered as part of the detailed design phase n. Use of high efficient motors (IE2 and IE4 class) will be included as part of the detailed design phase o. Preheating of yankee coating shower water with a heat exchanger will be included as part of the detailed design phase p. Not applicable ï sludge will not be undergoing drying at the facility q. Not applicable ï there will be no drying hood at the facility r. The detailed design phase will consider include heat recovery of exhaust air from the Yankee hood with a trickling tower s. Not applicable ï heat recovery from the infrared exhaust hot air is not possible as there are no infrared driers proposed for the installation.	

6.3 Conclusions

6.3.1 The table below shows the outcomes of the BAT conclusions assessment:

Table 6.2: BAT Assessment Outcomes

BAT Conclusion	Compliance Status
BAT 1: Environmental management system	Compliant by the time the facility starts to operate
BAT 2: Materials management and good housekeeping	Compliant by the time the facility starts to operate
BAT 3: Materials management and good housekeeping	Compliant by the time the facility starts to operate
BAT 4: Water and wastewater management	Not Applicable
BAT 5: Water and wastewater management	Compliant by the time the facility starts to operate
BAT 6: Energy consumption and efficiency	Compliant by the time the facility starts to operate
BAT 7: Emissions of odour	Compliant by the time the facility starts to operate
BAT 8: Monitoring of key process parameters and of emissions to water and air	Compliant by the time the facility starts to operate
BAT 9: Monitoring of key process parameters and of emissions to water and air	Not Applicable
BAT 10: Monitoring of key process parameters and of emissions to water and air	Compliant by the time the facility starts to operate
BAT 11: Monitoring of key process parameters and of emissions to water and air	Not Applicable
BAT 12: Waste management	Compliant by the time the facility starts to operate
BAT 13: Emissions to water	Not Applicable
BAT 14: Emissions to water	Compliant by the time the facility starts to operate
BAT 15: Emissions to water	Not Applicable
BAT 16: Emissions to water	Compliant by the time the facility starts to operate
BAT 17: Emissions of noise	Compliant by the time the facility starts to operate
BAT 18: Decommissioning	Compliant by the time the facility starts to operate
BAT 47: Wastewater and emissions to water	Compliant by the time the facility starts to operate
BAT 48: Wastewater and emissions to water	Not Applicable
BAT 49: Wastewater and emissions to water	Not Applicable
BAT 50: Wastewater and emissions to water	Compliant by the time the facility starts to operate
BAT 51: Emissions to air	Not Applicable
BAT 52: Waste generation	Compliant by the time the facility starts to operate
BAT 53: Energy consumption and efficiency	Compliant by the time the facility starts to operate

6.3.2 Based on a review of the available information it has been assessed the site/operator will be compliant with the requirements of the above applicable BAT conclusions by the time the facility starts to operate.

6.3.3 There are no BAT conclusions that the operator requires derogation from at this point in time.

References

1. The Environmental Permitting (England and Wales) Regulations 2016 - https://www.legislation.gov.uk/uksi/2016/1154/contents/made
2. BAT Reference Documents - https://eippcb.jrc.ec.europa.eu/reference
3. Environment Agencyõs (EAõs) Risk Assessments for your environmental permit guidance - https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit
4. Risk assessments for specific activities: environmental permits - https://www.gov.uk/government/collections/risk-assessments-for-specific-activities-environmental-permits
5. EA technical guidance note (TGN) M1 Sampling requirements for stack emission monitoring guidance - https://www.gov.uk/government/publications/m1-sampling-requirements-for-stack-emission-monitoring
6. EA Guidance: Monitoring stack emissions: techniques and standards for periodic monitoring - https://www.gov.uk/government/publications/monitoring-stack-emissions-techniques-and-standards-for-periodic-monitoring
7. EA TGN M5 - Monitoring of stack gas emissions from medium combustion plants and specified generators - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/741509/TGN-M5-Monitoring-of-stack-gas-emissions-from-medium-combustion-plants-and-specific-generators.pdf

APPENDICES

Appendix A

Application Forms

Appendix B

Site Plans

Appendix C

Environmental Risk Assessment

Appendix D

Site Condition Report & Baseline Assessment

Appendix E

Air Quality Assessment

Appendix F

Water Discharge Assessment

Appendix G

NoiseAssessment

Appendix H

Energy Balance, Water Balance & Flow Diagram

Appendix I

Safety Data Sheets

Appendix J

CHP Scheme

Appendix K

Pre-Application Information

Appendix L

OPRA

Appendix M

ES Technical Papers