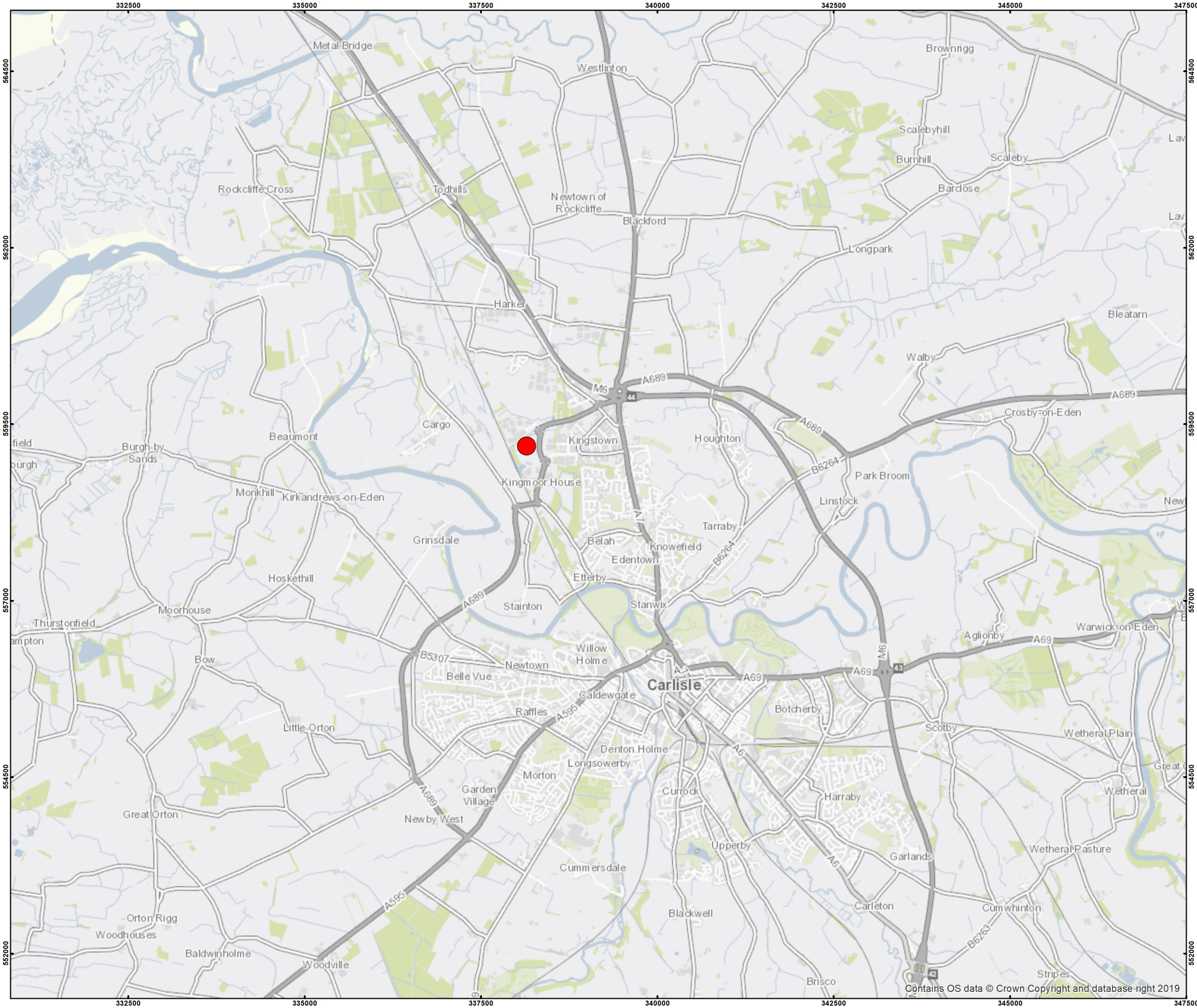
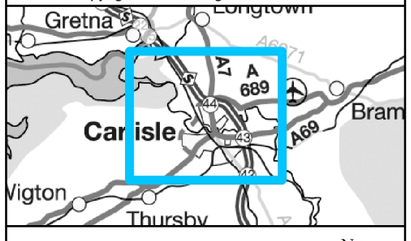


Legend

Site Location

Client:	Fortum
Site:	Kingmoor ERF
Project:	EP Application
Title:	Figure 1 - Site Location
Drawn by: Stuart Nock	Date: 06/12/2019



0 0.5 1 2 km

Scale: 1:50,000

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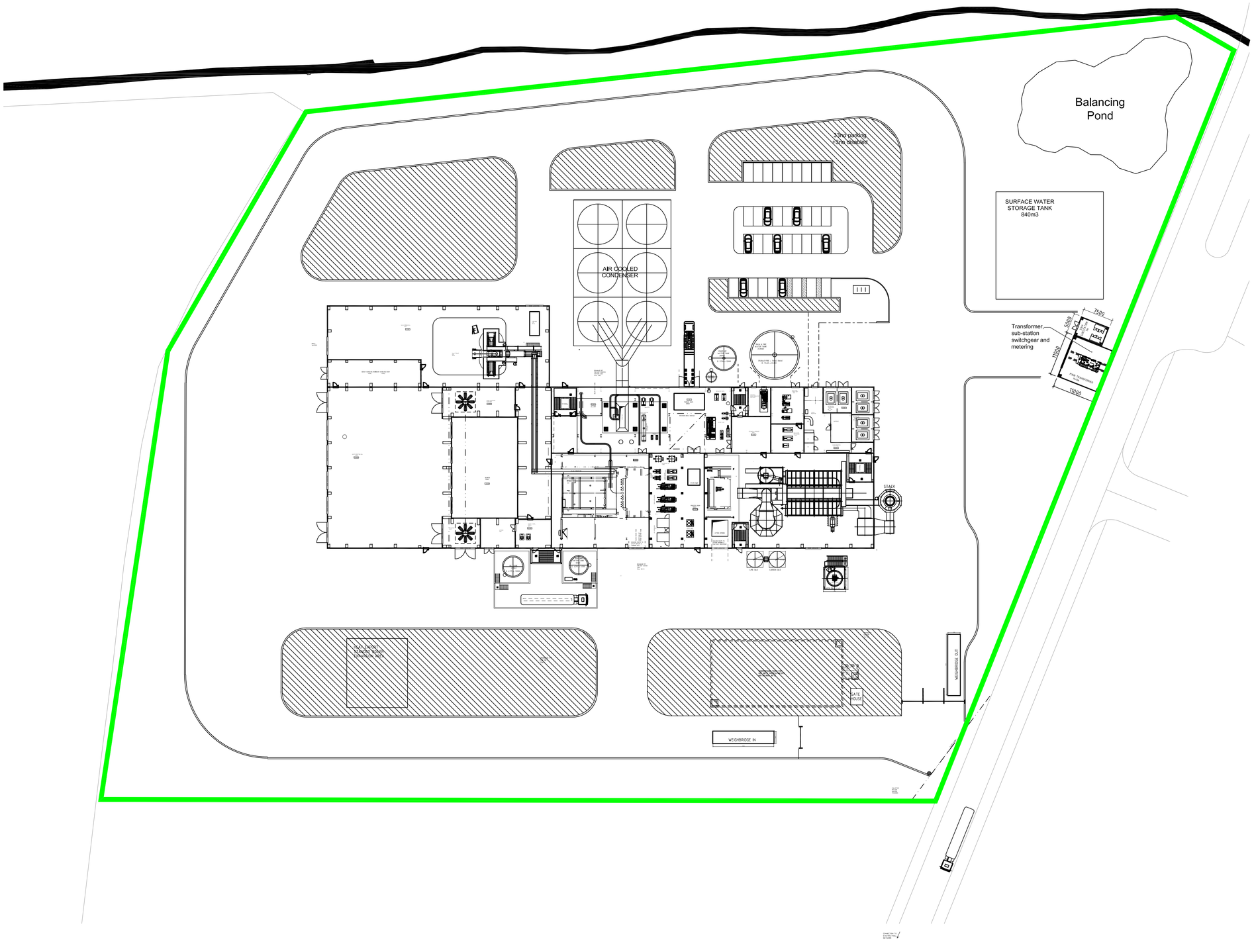
Fax: 0161 474 0618



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DO NOT SCALE

NOTES:

INSTALLATION BOUNDARY

REV.	DETAILS OF REVISION	DRAWN	CHKD	APR	DATE
R1.0	PRELIMINARY	DTW	AO	JB2	26.11.19

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CLIENT: FORTUM

SITE: KINGMOOR ERF

PROJECT: KINGMOOR ERF

TITLE: INSTALATION BOUNDARY

DRAWING STATUS:	PRELIMINARY	
DRAWN BY:	DTW	DATE: 26.11.19
CHECKED BY:	AO	DATE: 26.11.19
APPROVED BY:	JB2	DATE: 26.11.19
FILENAME:	S2856-8000-0002DW KINGMOOR ERF SITE LAYOUT R1.0	
OFFICE OF ISSUE:	STOCKPORT	
SHEET SIZE:	A1	SCALE: 1:500

DRAWING No.: S2856-8000-0002 sheet 1 or 1

REVISION: R1.0

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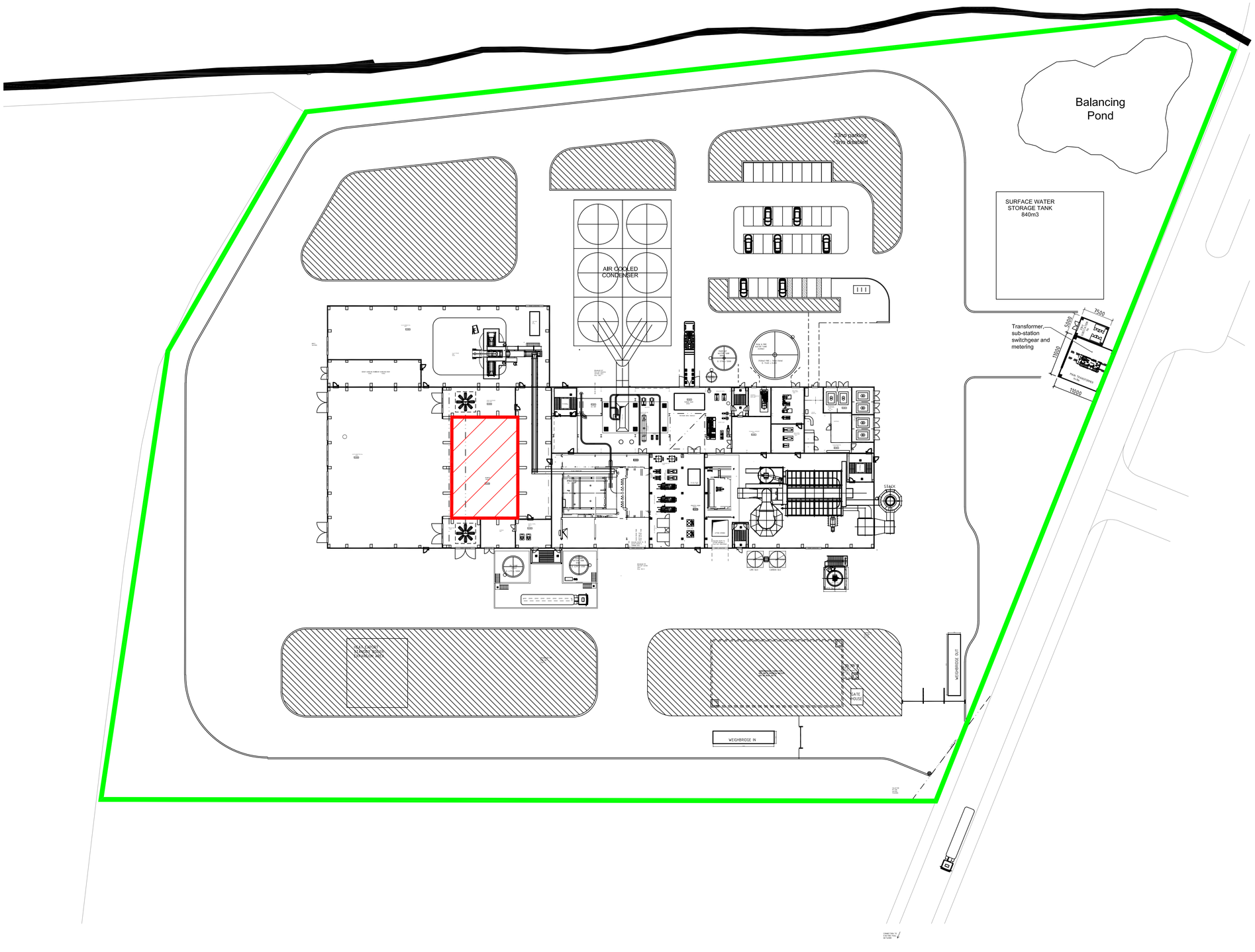
SCALE IN METRES



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NOTES:

INSTALLATION BOUNDARY

WASTE STORAGE AREAS

10 0 10 20 30 40 50

SCALE IN METRES

REV.	DETAILS OF REVISION	DRAWN	CHKD	APR	DATE
R0.0	PRELIMINARY	AO	DTW	KH	28.11.19

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CLIENT: FORTUM

SITE: KINGMOOR ERF

PROJECT: KINGMOOR ERF

TITLE: WASTE STORAGE AREAS

DRAWING STATUS:	PRELIMINARY	
DRAWN BY:	AO	DATE: 28.11.19
CHECKED BY:	DTW	DATE: 28.11.19
APPROVED BY:	KH	DATE: 28.11.19
FILENAME:	S2856-8000-0004AO KINGMOOR ERF WASTE STORAGE AREAS R0.0	
OFFICE OF ISSUE:	STOCKPORT	
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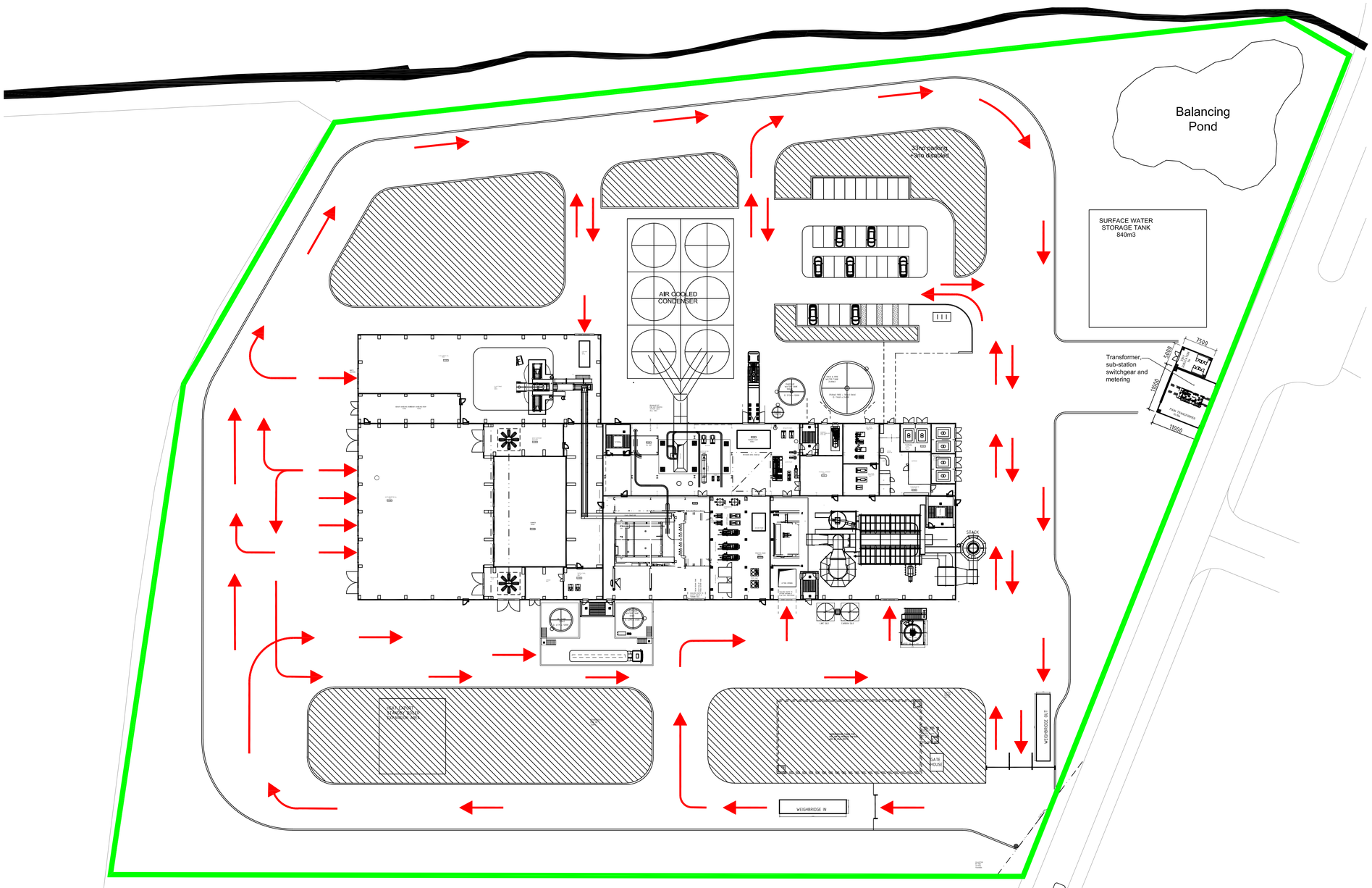
DRAWING No.: S2856-8000-0004 sheet 1 or 1

REVISION: R0.0



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NOTES:

INSTALLATION BOUNDARY

ACCESS POINTS & ROUTES

10 0 10 20 30 40 50

SCALE IN METRES

REV.	DETAILS OF REVISION	DRAWN	CHKD	APR	DATE
R0.0	PRELIMINARY	AO	DTW	KH	28.11.19

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CLIENT: FORTUM

SITE: KINGMOOR ERF

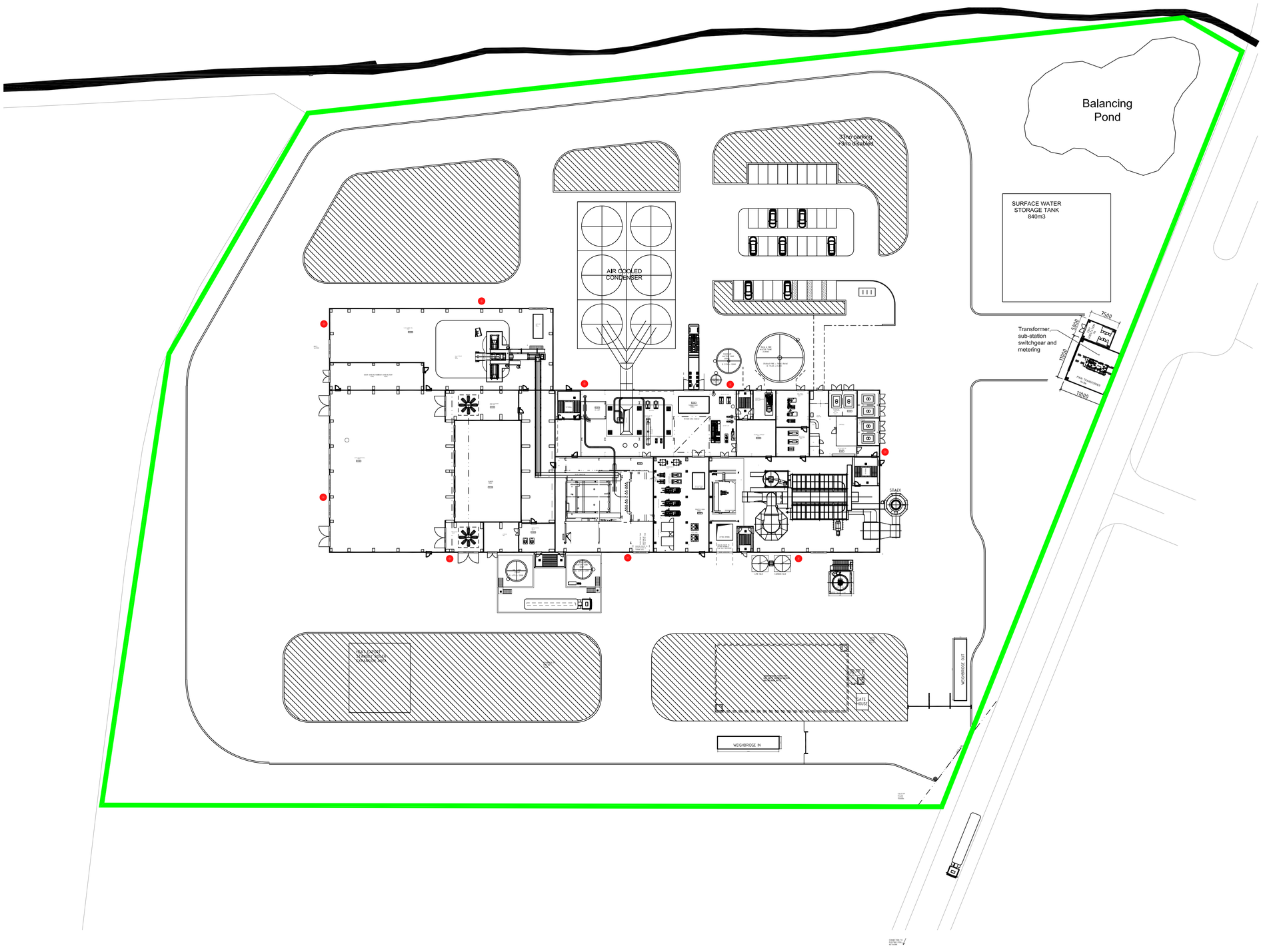
PROJECT: KINGMOOR ERF

TITLE: ACCESS POINTS

DRAWING STATUS:	PRELIMINARY	
DRAWN BY:	AO	DATE: 28.11.19
CHECKED BY:	DTW	DATE: 28.11.19
APPROVED BY:	KH	DATE: 28.11.19
FILENAME:	S2856-8000-0005AO1 KINGMOOR ERF ACCESS POINTS R0.0	
OFFICE OF ISSUE:	STOCKPORT	
SHEET SIZE:	A1	SCALE: 1:500

DRAWING No.: S2856-8000-0005 sheet 1 or 1

REVISION: R0.0



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DO NOT SCALE

NOTES:

- INSTALLATION BOUNDARY
- INDICATIVE FIRE HYDRANTS

10 0 10 20 30 40 50

SCALE IN METRES

REV.	DETAILS OF REVISION	DRAWN	CHKD	APR	DATE
R0.0	PRELIMINARY	AO	DTW	KH	28.11.19

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CLIENT: FORTUM

SITE: KINGMOOR ERF

PROJECT: KINGMOOR ERF

TITLE: INDICATIVE FIRE HYDRANTS

DRAWING STATUS:	PRELIMINARY	
DRAWN BY:	AO	DATE: 28.11.19
CHECKED BY:	DTW	DATE: 28.11.19
APPROVED BY:	KH	DATE: 28.11.19
FILENAME:	S2856-8000-0006AD KINGMOOR ERF INDICATIVE FIRE HYDRANTS R0.0	
OFFICE OF ISSUE:	STOCKPORT	
SHEET SIZE:	A1	SCALE: 1:500

DRAWING No.: S2856-8000-0006 sheet 1 of 1

REVISION: R0.0

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DO NOT SCALE

NOTES:

- INSTALLATION BOUNDARY
- INDICATIVE FIRE WALLS

10 0 10 20 30 40 50

SCALE IN METRES

REV.	DETAILS OF REVISION	DRAWN	CHKD	APR	DATE
R0.1	PRELIMINARY	DTW		KH	23.12.19

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Website: www.fichtner.co.uk

CLIENT: FORTUM

SITE: KINGMOOR ERF

PROJECT: KINGMOOR ERF

TITLE: INDICATIVE FIRE WALLS

DRAWING STATUS:	PRELIMINARY	
DRAWN BY:	AO	DATE: 28.11.19
CHECKED BY:	DTW	DATE: 28.11.19
APPROVED BY:	KH	DATE: 28.11.19
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OFFICE OF ISSUE:	STOCKPORT	
SHEET SIZE:	A1	SCALE: 1:500

DRAWING No.: S2856-8000-0007 sheet 1 of 1

REVISION: R0.1

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Consulting Engineers Limited

Kingmoor Energy Recovery Facility

Fortum Carlisle Limited

Fire Prevention Plan

ENGINEERING CONSULTING

Document approval

	Name	Signature	Position	Date
Prepared by:	James Bernays		Project Engineer	02/12/2019
Checked by:	James Sturman		Senior Environmental Consultant	06/12/2019

Document revision record

Revision no	Date	Details of revisions	Prepared by	Checked by
00	06/12/2019	For Client	JB2	JRS
01	18/12/2019	For Client	KLH	JRS
02	03/01/2020	Minor updates following Client comments	KLH	JRS

Contents

1 Introduction

Fortum Carlisle Limited (the Applicant) is applying to the Environment Agency (EA) under the Environmental Permitting Regulations (EPRs) for an Environmental Permit (EP) to operate an Energy from Waste (EfW) plant, to be known as Kingmoor Energy Recovery Facility (Kingmoor ERF, the Facility). The Facility will comprise a waste incineration facility together with an associated electrical connection, and the potential to export heat.

1.1 Project description

A detailed description of the Facility is presented in Section 1.4 of the Supporting Information.

1.2 Objective

The objective of this report is to provide a preliminary Fire Prevention Plan (FPP) for the Facility, identifying the provisions which have been taken into account during the development phase of the Facility. In addition, provisional operational measures have been identified where these are available. The report will be subject to review following completion of detailed process design. The development is expected to take about three years to design, build, commission and commence full operational status.

This report has been developed in accordance with Environment Agency guidance note: *Fire Prevention Plans: Environmental Permits*, as published on the UK government website. The requirements of the FPP will be integrated within the emergency plans and procedures for the Facility to ensure that they are consistent and compatible with other management systems associated with the operation of the Facility.

A suite of emergency procedures for the Facility will be written and included in the training package for all staff and contractors. Training of site operatives will commence approximately 6 months prior to commencement of commissioning of the Facility, and all operational personnel will be tested on the fire prevention and emergency procedures.

This document and the measures to mitigate the risk and impact of fires within the Facility have been (and will continue to be) developed in accordance with the requirements of the following:

- Environment Agency guidance note *'Fire Prevention Plans: Environmental Permits',* Updated 4th May 2018;
- Building Regulations – *Approved Document B (Fire Safety)*;
- ACE Technical Risks, Engineering Information Bulletin, Guidance document Energy from Waste (EfW) – Fire Systems Issue 1.0 (26 March 2014);
- ACE Technical Risks, Engineering Information Bulletin, Guidance Document Waste Processing Plants – Fire Systems Issue 1.0 (26 March 2014);
- National Fire Protection Association *'NFPA 850: Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations'*, 2015 Edition; and
- the insurer's requirements where structures or equipment fall outside published guidance or recommended practice.

2 Site location and description

2.1 The site

The Facility will be located on Kingmoor Park Industrial Estate, Carlisle, with the stack located at a National Grid Reference of NY 38145 59189. The Site (herein referred to as the Installation Boundary) covers an area of approximately 4 ha.

To the north of the Installation Boundary is Kingmoor Park Road. The A689 is to the east of the Installation Boundary and a railway line (the West Coast Mainline) lies approximately 100m from the western boundary. A number of industrial facilities are located to the north, east and south of the Installation Boundary. Carlisle town centre lies approximately 5km south/southeast of the Site.

The Installation Boundary currently comprises low-lying land with scrub and grassland. No waterbodies are located at the Site with the exception of seasonal standing water. The Installation Boundary is relatively flat with a gentle slope from north to south. The topography varies from 14.3 mAOD to 14.5 mAOD.

A site location plan and Installation Boundary drawing are presented in Appendix A.

2.1.1 The activities

Activities covered by this EP application include:

1. single-line waste incineration plant processing incoming waste which is delivered to the site from off-site via road;
2. generation of power and export to the national grid, and the potential to export heat;
3. production of inert bottom ash material that will be transferred off-site to a suitably licensed waste treatment facility for recovery/disposal; and
4. generation of an air pollution control residue that will be transferred to a suitably licensed hazardous waste facility for disposal or recovery.

Table 2-1 lists the Schedule 1 activities, from the Environmental Permitting Regulations, and the Directly Associated Activities (DAA's).

Table 2-1: Scheduled and directly associated activities

Type of Activity	Schedule 1 Activity	Description of Activity
Installation	Section 5.1 Part A(1) (b)	The incineration of non-hazardous waste or RDF in a waste incineration plant with a maximum design capacity of up to 31,3 tonnes per hour.
Directly Associated Activities		
Directly Associated Activities		Waste reception, storage and handling facilities
Directly Associated Activities		Combustion and energy recovery processes including the export of electricity to the National Grid
Directly Associated Activities		Flue gas treatment

Type of Activity	Schedule 1 Activity	Description of Activity
Directly Associated Activities		Residue storage and handling facilities
Directly Associated Activity		Standby electrical generation to provide electrical power to the plant in the event of an interruption in the supply.

The Stationary Technical Unit (the Facility) comprises waste reception; waste storage; water, fuel oil and air supply systems; furnace; boiler; steam turbine/generator set; facilities for the treatment of exhaust or flue gases; on-site facilities for treatment or storage of residues and waste water; flue with associated stack; and devices and systems for controlling combustion operations and recording and monitoring conditions.

Assuming a design NCV of 10 MJ/kg, the Facility will process approximately 250,000 tonnes per annum (at the design capacity of 31.3 tph, assuming 8,000 hours availability).

Allowing for the full range of NCV wastes that the Facility can process (8-15 MJ/kg), and assuming continuous operation throughout the year (i.e. 8,760 hours of operation), the Facility will have a maximum capacity of up to approximately 274,000 tonnes per annum.

2.2 Site plans & drawings

The following plans are included in Appendix A:

- site location plan (Appendix A.1);
- installation boundary (Appendix A.2);
- waste storage areas plan (Appendix A.3);
- access points around the perimeter to assist fire-fighting (Appendix A.4);
- indicative locations of fire hydrants and water supplies (Appendix A.5); and
- indicative locations of fire walls (Appendix A.6).

As stated in section 1.2, detailed process design will be undertaken following final contract negotiations and selection of the EPCM Consultant. Therefore, the information in relation to some of the drawings identified above must be considered to be indicative until detailed design has been completed. Following completion of detailed design, the following drawings will be included within the updated FPP;

- the location of drain covers and any pollution control features such as drain closure values and firewater containment systems;
- site drainage plan;
- the location of gas cylinders; and
- the location of plant, protective clothing and pollution control equipment and materials.

Wind roses indicating the direction of prevailing winds for the Facility from 2006 to 2010, are presented in Appendix B.

2.3 Key receptors

The key receptors which could be impacted by a fire at the Facility are presented in the following table:

Table 2-2: Fire prevention plan receptors

ID	Name	Location		Distance from the stack [m]
		x	y	
R1	Parkhouse Road	338601	560207	1,117
R2	Grearshill Farm	339000	560239	1,355
R3	Kingstown Road 1	339481	559649	1,413
R4	Kingstown Road 2	339486	559738	1,449
R5	Kingstown Road 3	339497	559465	1,379
R6	Kingstown Road 4	339533	559253	1,389
R7	Lowry Gardens	339393	558870	1,287
R8	Lowry Hill Road	338926	558901	831
R9	Coophouse Lane	337060	558098	1,538
R10	Cargo Road	337265	559424	912
R11	Edenside	337020	559591	1,196
R12	Maxwell Drive	337745	560021	925
R13	Crindledyke Estate	338432	560483	1,327
R14	James Rennie School	339667	559299	1,525
R15	Kingmoor Junior School	339197	558575	1,216

3 Fire prevention

3.1 Waste storage

3.1.1 Waste bunker

Incoming waste for processing at the Facility will be transferred into the waste bunker. Allowing for stacking within the bunker, the waste storage capacity of the bunker will be approximately 6,700 m^3. The maximum capacity of the bunker will be approximately 2,350 tonnes, which will be equivalent to 3 days of waste processing capacity. A plan showing the location of the waste bunker is presented in Appendix A.2, with the detailed design of the bunker to be done by the EPCM Consultant.

With respect to the potential volume of firewater required, this will be considerably less than the total potential (or 'airspace') volume of the bunker i.e. reduced by the volume taken up by waste at the time of a potential fire.

The bunker is designed as a 2-hour fire compartment. Water cannons will be installed over the waste bunker (refer to Section 4.8.6). These measures are in in accordance with the requirement of NFPA and insurers for plants which combust waste derived fuels.

Bunker management procedures will be adopted to ensure that there is a constant turnover of waste within the bunker, preventing hotspots or anaerobic conditions within the waste bunker. The crane will be sized to allow for mixing and rotating the waste within the bunker, whilst providing appropriate quantities of waste within the feed hopper to maintain operation of the waste combustion process. The regular 'turning over' of the contents of the bunker will ensure that waste does not accumulate within the lower levels of the bunker. The size of the crane will ensure that the mixing of waste is feasible in relation to the amount of waste present in the bunker. The crane operator will be trained in careful waste handling and crane operation as to maintain the integrity of the bunker.

Thermal imaging cameras will be fixed around the perimeter of the bunker to provide the crane driver with a continuous thermal 'map' of the bunker. The crane driver will, therefore, be able to identify and react to hot areas in the bunker and undertake mixing or feeding of waste as appropriate, or, in extreme cases, use the firewater cannons to extinguish any smouldering/burning waste. In addition, there will be a video camera located above the waste feed hopper and there are firefighting nozzles in the waste hopper.

The 3 objectives of the FPP guidance note are met as follows:

- The combination of the mixing of the waste within the bunker and the thermal imaging cameras is considered to minimise the likelihood of a fire occurring within the waste bunker.
- Section 4.8 of this report details active fire-fighting measures to be implemented should a fire break out. Utilising these measures, the Facility aims to extinguish a fire within 4 hours.
- The fire walls (described in Section 4.4) will minimise the spread of fire within the site and to neighbouring sites.

It should also be noted that the bunker will be constructed to protect against the leak of contaminated firewater and to minimise the risk of emissions of pollutants to groundwater. The floor will be of sufficient strength/hardiness as to maintain integrity in the event of a fire.

The non-hazardous waste types to be treated at the Facility, which may comprise municipal or commercial and industrial waste, are presented in Table 3-1:

Table 3-1: Wastes to be processed in the Facility

EWC Code	Description of Waste
Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard	
02 01	*Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing*
02 01 03	Plant-tissue waste
02 01 04	Waste plastics (except packaging), which is otherwise not suitable for recycling
02 01 07	Wastes from forestry
02 01 09	Agrochemical waste other than those mentioned in 02 01 08
02 06 01	Materials unsuitable for consumption or processing
02 02	*Wastes from the preparation and processing of meat, fish and other foods of animal origin*
02 02 02	Animal-tissue waste
02 02 03	Materials unsuitable for consumption or processing
02 03	*Wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation*
02 03 04	Materials unsuitable for consumption or processing
02 06	*Wastes from the baking and confectionery industry*
02 06 01	Materials unsuitable for consumption or processing
Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard	
03 01	*Wastes from wood processing and the production of panels and furniture*
03 01 01	Waste bark and cork
03 01 05	sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04
03 03	*Wastes from pulp, paper and cardboard production and processing*
03 03 01	Waste bark and wood
03 03 07	Mechanically separated rejects from pulping of waste paper and cardboard
03 03 08	Wastes from sorting of paper and cardboard destined for recycling
Wastes from the leather, fur and textile industries	
04 02	*Wastes from the textile industry*
04 02 09	Wastes from composite materials (impregnated textile, elastomer, plastomer)
04 02 10	Organic matter from natural products (e.g. grease, wax)
04 02 21	Wastes from unprocessed textile fibres
04 02 22	Wastes from processed textile fibres
Waste packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified	
15 01	*Packaging (including separately collected municipal packaging waste)*
15 01 01	Paper and cardboard packaging

EWC Code	Description of Waste
15 01 02	Plastic packaging
15 01 03	Wooden packaging
15 01 05	Composite packaging
15 01 06	Mixed packaging
15 01 09	Textile packaging
Wastes not otherwise specified in the list	
16 03	*Off-specification batches and unused products*
16 03 04	Inorganic wastes other than those mentioned in 16 03 03
16 03 06	Organic wastes other than those mentioned in 16 03 05
Construction and demolition wastes (including excavated soil from contaminated sites)	
17 02	*Wood, glass and plastic*
17 02 01	Wood
17 02 03	Plastic
17 09	*Other construction and demolition wastes*
17 09 04	Mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03
Wastes from human or animal health care and/or related research (except kitchen and restaurant wastes not arising from immediate health care)	
18 01	*Wastes from natal care, diagnosis, treatment or prevention of disease in humans*
18 01 01	Sharps (except 18 01 03)
18 01 04	Wastes whose collection and disposal is not subject to special requirements in order to prevent infection (for example dressings, plaster casts, linen, disposable clothing, diapers)
18 01 09	Medicines other than those mentioned in 18 01 08
18 02	*Wastes from research, diagnosis, treatment or prevention of disease involving animals*
18 02 01	Sharps (except 18 02 02)
18 02 03	Wastes whose collection and disposal is not subject to special requirements in order to prevent infection
18 02 08	Medicines other than those mentioned in 18 02 07
Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use	
19 02	*Wastes from physical/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)*
19 02 03	Premixed wastes composed only of non-hazardous wastes
19 02 10	Combustible wastes other than those mentioned in 19 02 08 and 19 02 09
19 05	*Wastes from aerobic treatment of solid wastes*
19 05 01	Non-composted fraction of municipal and similar wastes

EWC Code	Description of Waste
19 05 02	Non-composted fraction of animal and vegetable waste
19 05 03	Off-specification compost
19 06	*Wastes from anaerobic treatment of waste*
19 06 04	Digestate from anaerobic treatment of municipal waste
19 06 06	Digestate from anaerobic treatment of animal and vegetable waste
19 08	*Wastes from waste water treatment plants not otherwise specified*
19 08 01	Screenings
19 10	*Wastes from shredding of metal-containing wastes*
19 10 04	Fluff-light fraction and dust other than those mentioned in 19 10 03
19 12	*Wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified*
19 12 01	Paper and cardboard
19 12 04	Plastic and rubber
19 12 07	Wood other than that mentioned in 19 12 06
19 12 08	Textiles
19 12 10	Combustible waste (refuse derived fuel)
19 12 12	Other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	
20 01	*Separately collected fractions (except 15 01)*
20 01 01	Paper and cardboard (rejects from materials recovery plants only)
20 01 08	Biodegradable kitchen and canteen waste
20 01 10	Clothes
20 01 11	Textiles
20 01 28	Paint, inks, adhesives and resins other than those mentioned in 20 01 27
20 01 32	Medicines other than those mentioned in 20 01 31
20 01 37*	Wood containing dangerous substances (the content of any dangerous substances within the waste not to exceed in threshold for classification as hazardous waste)
20 01 38	Wood other than that mentioned in 20 01 37 (rejects from materials recovery plants only)
20 01 39	Plastics (rejects from materials recovery plants only)
20 02	*Garden and park wastes (including cemetery waste)*
20 02 01	Biodegradable waste
20 03	*Other municipal wastes*
20 03 01	Mixed municipal waste
20 03 02	Waste from markets
20 03 03	Street-cleaning residues

EWC Code	Description of Waste
20 03 04	Septic tank sludge
20 03 07	Bulky waste

3.1.2 Quarantine area for unacceptable waste

A suitable area for the quarantine of unacceptable waste will be designated as part of the detailed design stage. The quarantine area will be used to temporarily store, if needed, any unacceptable waste prior to removal from site. Unacceptable waste is waste which does not meet the requirements set out in the fuel supply agreements which have been agreed with waste suppliers for the Facility, or other waste which is unsuitable for incineration and/or not compliant with the EWC codes permitted by the EP.

The quarantine area will be designed to enable unacceptable waste to be segregated from all other incoming waste, allowing it to be collected and loaded into appropriate road vehicles for removal off-site.

Appropriate fire detection and protection measures (e.g. smoke/flame detectors, hose reel, sprinklers, or water cannon) will be installed in the quarantine area. The final design of the quarantine area will be subject to detailed design and agreed with fire risk insurers.

Additionally, for unacceptable waste identified inside the bunker, a skip will be positioned on the bottom of the grab maintenance opening, and unacceptable waste out-loaded from the bunker into the skip for examination and/or removal from the site to a licensed disposal facility.

3.1.3 Incinerator Bottom Ash

Bottom ash from the waste incineration process will be transferred to the Incinerator Bottom Ash (IBA) storage area. The size of the IBA storage area will be subject to detailed design, but it is estimated that it will have a capacity to store approximately 650 tonnes of IBA.

3.1.4 Air Pollution Control residues

Air Pollution Control residues (APCr) will be stored within a silo. The design of the silo is subject to detailed design, however it is expected that the total storage capacity for APCr will be approximately 200 tonnes. The silo will be elevated above-ground level so that APCr can be discharged into road tankers from above. Removal of the APCr will be by sealed tankers, with telescopic chutes used to discharge the APCr into the road tankers.

3.2 Storage duration

3.2.1 Waste bunker

Allowing for the design capacity of the Facility, it is estimated that the maximum period which waste will remain in the waste bunker during normal operation is approximately 5 days, or additional days if a shut-down of the Facility occurs. However, the quantity of waste stored within the bunker will be significantly reduced prior to a planned shut-down.

Following the recommencement of waste deliveries after a period of shutdown, deliveries of ‘new’ waste will be mixed with residual quantities of waste within the bunker. This ensures that ‘old’ waste is not ‘buried’ within the bunker.

3.2.2 Quarantine area for unacceptable waste

The quarantine area will be used, if needed, for the inspection and storage of unacceptable waste. Waste will only be retained in this area for a few hours whilst it is inspected. After inspection and verification of the waste it will either be:

- transferred to the waste bunker; or
- transferred off-site to a suitably licensed waste management facility;

depending on whether the waste was deemed unacceptable or not.

3.2.3 Incinerator Bottom Ash

The IBA storage area will have sufficient capacity for the storage of approximately 4 days of IBA, assuming that the Facility operates continuously at the nominal capacity.

3.2.4 Air Pollution Control residues

APCr will be stored in a silo with a total storage capacity of approximately 200 tonnes. Assuming that the Facility operates continuously at the nominal capacity, this equates to approximately 6 days of storage in total.

3.3 Monitoring of stores for waste and recovered materials

In accordance with the waste acceptance procedures, which will be developed for the Facility, unloading of all waste deliveries will be supervised by operational staff.

CCTV will be installed in all areas where waste delivery vehicles discharge waste into the bunker. The design of the CCTV systems will be undertaken during detailed design of the Facility.

Within the Facility, the waste bunker will be continuously monitored by the fully automatic thermal imaging system. During daytime operation, the bunker will be visually monitored by control personnel. At night-time, the control personnel will visually monitor the thermal imaging system as part of their responsibilities for operating the Facility.

3.4 Actions to limit self-heating

3.4.1 Waste bunker

There will be thermal imaging cameras fixed around the perimeter of the bunker to provide the control personnel with a continuous thermal ‘map’ of the surface of the waste pile within the bunker. The control personnel will, therefore, be able to identify and react to hot areas in the bunker and undertake mixing or feeding of waste as appropriate.

The turning of waste within the bunker is standard practice at UK plants that combust waste derived fuels. As well as helping to mix the waste (to produce a more homogenous fuel which is better for control of the combustion process), it helps to prevent the formation of hotspots. Turning helps to release heat that has built up in the waste. By taking grabs of waste and then spreading over a wider area, turning dissipates entrained heat and removes thermal inertia within the waste. It also increases the evaporation of water, which is a heat absorbing process. These factors help to minimise the risk of self-heating and ignition. In addition, mixing the waste with the crane enables waste from the base of the bunker to be brought to the surface.

In extreme cases, if the heat does not dissipate as expected, the firewater cannons will be used to extinguish any smouldering/burning waste, with the cannons providing the principal method of extinguishing the smouldering/burning waste.

3.4.2 IBA storage

Due to the high thermal temperatures in which the IBA has been combusted, it will not be expected to contain any combustible materials which are able to self-combust from the elevated temperatures within the IBA. The IBA storage area will have sufficient capacity for the storage of approximately 4.3 days of IBA, assuming that the Facility operates continuously at the nominal capacity.

3.4.3 APCr storage

The APCr is not expected to contain any combustible materials which could self-combust from elevated temperatures within the APCr. APCr will be stored in a silo with a 200 tonne capacity. Assuming that the Facility will operate continuously at the nominal capacity, this equates to approximately 6 days storage in total.

3.5 Contingency

In the event that the Facility is not able to receive waste due to an unplanned incident forcing a full shutdown of the Facility, waste deliveries will be stopped and/or diverted to a suitably licenced waste management facility.

If there was a significant fire requiring a full shutdown of the Facility, the Facility will not restart operations until the relevant regulatory authorities (Fire Service, Health and Safety Executive, Environment Agency, etc.), as well as the fire insurers, advised that it was safe to do so. During a complete shutdown of the Facility, the fire detection systems will remain operational.

Dependent on the nature and scale of any incidents, it may be necessary to notify local residents and businesses of the incident. Prior to commencement of operation of the Facility, and as part of the development of the documented management systems associated with the operation of the Facility, communication procedures will be developed and implemented.

Prior to the planned shutdown of the Facility, waste deliveries will be stopped and/or diverted to alternative waste management facilities, and the waste within the bunker will be combusted to minimize the quantity of waste remaining in the bunker prior to the shutdown commencing. This will ensure that there is only a small residue in the bunker during the period of shutdown.

The temperature of waste in the waste bunker will continue to be monitored by the thermal imaging system during a planned shut-down. Therefore, the crane operators or the control room will be able to continue to mix waste to prevent excessive temperatures in the bunker, or if necessary use the fire-fighting cannons.

3.6 Seasonality

The Facility is expected to operate continuously throughout the year, and will not be subject to any seasonal variations in the demand for incoming wastes to be treated or the resulting residues generated.

3.7 Arson or vandalism

Security measures will prevent access by members of the public and thereby prevent the risk of arson attacks or vandalism. The Facility will be surrounded by security fencing. A barrier will be present at the entrance and exit of the site to control vehicular access. Only authorised visitors will be able to enter the site.

The Facility will be operational and manned 24 hours a day, 7 days a week, with the CCTV system monitored in the control room by trained and competent operators. The shift team leaders will be responsible for security on the site, including delivery vehicles as they travel around the site.

Emergency response procedures will be developed for the Facility, prior to the commencement of operations, as part of the detailed Environmental Management System (EMS). The procedures will detail the response to a number of different emergency situations on site, including unauthorised personnel accessing the Facility.

3.8 Plant and equipment

An operating and maintenance manual (O&M manual) will be developed and completed through the commissioning phase of the installation. The O&M Manual will set out detailed operating and maintenance instructions for all the plant and equipment which requires maintenance.

Maintenance procedures and work instructions will be developed to cover all plant and equipment within the Facility. As part of such work instruction development, the risk of fire will be considered, and appropriate activities included within the work instruction to reduce the risk of fire in all plant and equipment.

As part of the maintenance system, responsibilities for retaining records of all maintenance undertaken and any actions taken following a problem will be defined.

3.9 Infrastructure and site inspections

Regular site inspections will be undertaken which will cover all operational areas as part of the normal operating procedures. Records of site inspections will be retained on-site. Inspections of the main operational areas will be carried out, as a minimum, during every operating shift, with maintenance work instructions raised for any items identified.

3.10 Electrical faults

The risk of electrical faults on site will be minimised by the use of qualified electricians and will comply with the relevant British Standards for the design and installation of electrical equipment and supplementary bonding/earthing.

Electrical equipment will be checked and maintained as part of the planned maintenance regime as required in the detailed operating manuals for each piece of equipment.

3.11 Ignition sources

A review under the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) will be completed during the detailed design of the Facility, with any risk areas identified on DSEAR zonal drawings.

Vehicles and electrical items necessary for the operation of the Facility will be regularly inspected for electrical faults. All mobile plants serving the Facility will be fitted with fire extinguishers and dust filters.

Naked sources of ignition will be controlled through a hot work management system. This system will cover both staff and contractors working at the Facility. The hot work management system will also include requirements to train and authorise 'hot work risk assessors' for the purposes of eliminating, reducing and managing the risks associated with hot work. The hot work system will include for a period of fire watch following the hot works being undertaken.

As part of the hot work management system, the potential for sources of ignition to cause fires will be managed on a case-by-case basis. Where feasible, the guidance of keeping all sources of ignition at least 6 metres away from any combustible or flammable waste will be followed as part of this management system. This will include ensuring that the location of stored mobile plants, which is subject to detailed design of the Facility, will be stored at least 6 metres away from combustible wastes.

All visitors will be informed about the fire safety precautions as part of the induction procedures.

The guidance of keeping sources of ignition at least 6 m away from any combustible or flammable waste will be followed as part of this management system. Potential sources of ignition are covered in more detail below.

3.12 Industrial heaters

It is currently expected that industrial heaters will not be installed at the Facility, however, this will be confirmed during detailed design of the Facility. If applicable, the hot work management system will be extended to include the use of industrial heaters and the necessary safeguards required in each instance will be assessed and implemented to ensure their use is safe.

3.13 Leaks and spillages of oils and fuels

Emergency response procedures will be developed as part of the emergency procedures for the Facility. The procedures will include actions to be undertaken to respond to spills and leaks of chemicals. This will include actions to be undertaken to prevent liquids leaking or trailing from site vehicles.

3.14 Build-up of loose combustible materials

The Facility will be designed to prevent the accumulation of dusts by designing structural members such that their shape or method of installation minimizes the surface area where dust can settle.

As part of the detailed design of the Facility, the control of dust and fluff has been considered. This includes:

- the use of an enclosed fuel reception/unloading building; and
- mechanical ventilation of waste storage areas to prevent fugitive emissions from the building façade.

These systems will be checked as part of the planned maintenance regime as required in the detailed operating manuals for each piece of equipment.

On a regular basis, inspections will be undertaken to identify the build-up of loose combustible materials, such as waste, dust and fluff. Where inspections identify that there has been a build-up

of loose combustible materials, appropriate cleaning will be undertaken to clean this material from the surfaces.

3.15 Hot exhausts

A fire watch system will be implemented to detect signs of fires from dusts settling on hot exhausts. This will be developed as part of the operating procedures. This will include daily visual checks of dusts settling on hot exhausts as part of the operational checks by operational staff for each shift.

3.16 No smoking policy

A no smoking policy will be adopted and implemented at the Facility. Smoking will be prohibited in operational areas. External areas designated for smoking within the Installation Boundary will be identified, with suitable facilities provided for staff.

3.17 Heat and spark prevention

A review under the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) will be completed during the detailed design of the Facility, with any risk areas identified on zoning drawings.

3.18 Gas bottle and other flammable items

Gas cylinders will be stored within purpose-built dedicated storage facilities. All facilities for the storage of gas cylinders will be kept locked/secured. The location of gas cylinder storage and other flammable items will be subject to detailed design. A plan showing the location of gas storage facilities and other flammable items will be included in Appendix A upon completion of detailed design.

A system for the regular inspection of gas storage facilities will be developed as part of the operating and maintenance procedures and the site inspection regime.

3.19 Fire watch

Operational staff will be briefed on the need for monitoring for the early signs of fires. The waste bunker and all main process areas will have CCTV to allow remote monitoring from the control rooms on a continuous basis.

All waste delivered to the Facility will be supervised by operational staff, who will be responsible for the inspection and monitoring of waste deliveries.

3.20 Smoke/heat/flame detectors

The choice of fire detection system (smoke/heat/flame detectors) to be installed within the Facility is subject to detailed design. However, it can be confirmed that the fire detection systems will be covered by a UKAS-accredited third-party certification scheme. This will be confirmed prior to the commencement of commissioning of the Facility.

A plan showing the chosen fire detection systems for the different areas of the Facility, depending on the suitability of each detection type for each process area, will be presented in Appendix A upon completion of detailed design.

4 Management and storage of waste

4.1 Incompatible/hot loads

Waste acceptance procedures will be developed for the Facility. These will include considerations for incompatible wastes and hot loads.

Contracts with dedicated waste companies will be put in place for the delivery of all wastes to be incinerated within the Facility. The contracts will have detailed waste specifications for the wastes to be delivered. This will restrict incompatible wastes to be delivered to the Facility.

Upon arrival at the weighbridge, the waste vehicles will be directed to the waste reception area.

Non-permitted wastes or incompatible waste will be identified by the delivery driver or by the operator through examination of the waste as it is being unloaded to the bunker. Furthermore, if unacceptable waste is identified within the bunker it will be able to be removed from the bunker using the crane grab.

Unacceptable wastes, including incompatible wastes and hot loads, if not immediately rejected, will be transferred to a dedicated quarantine area (refer to Sections 3.1.2, 3.2.2 and 4.5).

4.2 Waste acceptance – permitted waste

Prior to commencement of operations, waste acceptance procedures will be developed and implemented for the Facility. This fire prevention plan will be updated following development of the procedures. The procedures will include arrangements for the management of wastes which are permitted to be treated.

4.3 Waste storage – separation distance

Following consultation with the EA, it is understood that the storage requirements relating to pile separation distance only applies to external storage of wastes. As detailed in Section 3.1, all wastes which are delivered or stored within the site will be within buildings. Taking this into consideration, the pile separation distances will be adopted as good practice where feasible.

4.4 Fire walls

Fire walls will be installed within the buildings as required. The location and specification for fire walls will be subject to detailed design of the Facility, and dependent on the layout to be further developed by the EPCM Consultant. The indicative locations of these fire walls are given in Appendix A.6.

Subject to the location of the process equipment, operational areas will be segregated into fire zones (the "Fire Zones"). In accordance with NFPA 850, certain specific Fire Zones such as the waste bunker and boiler hall will be separated from each other by fire barriers with a minimum of 2-hour fire resistance rating, spatial separation, or by other approved means. The specific Fire Zones to which this applies, and the means of separation, will be subject to agreement with the fire risk insurers.

As part of the detailed design process, a fire risk assessment will be undertaken for each Fire Zone to identify the appropriate fire detection and protection systems in association with appropriate civil work design principles to control:

- the risk of fire propagation;
- the spread of fumes and smoke;
- firewater flooding; and
- to maintain the integrity of dedicated fire partition walls in the event of fire.

The fire zoning will be subject to the approval of Fortum and the fire risk insurers.

The dividing wall between the waste bunker hall and boiler hall and all other walls within the bunker will be suitably constructed in concrete, block work or a suitably rated cladding system up to roof level to form a continuous 2-hour fire rated barrier for the full width and height of the building structure. In addition, the base of the bunker will be constructed of reinforced concrete, and the whole structure has been designed as a water retaining structure. The structural design and construction of this dividing wall shall be such that the integrity of the fire barrier is maintained in the event of the collapse of the bunker hall roof due to a fire in the bunker. These walls and the base of the bunker will be resistant to crane grab impact and the impingement of water cannon jets. The structure of the waste bunker itself therefore will have adequate fire resistance.

All openings in fire barriers will be provided with fire doors, including fire dampers, penetration seals (fire stops), or other approved means having a fire protection rating consistent with the designated fire resistance rating of the barrier. Windows in fire barriers (e.g. control rooms, observation windows, computer rooms, etc.) will be provided with appropriate fire protection to maintain the integrity of the fire barrier, e.g. by means of a fire shutter, automatic water curtain, window sprinkler system, etc. All cable trays or piping systems passing through fire barriers will be fitted with fire stops.

In addition, the glass partition in the control room/crane cabin will be 2-hour fire rated, and hence resistant to fire. Therefore, the site staff will be able to continue operating the crane for a limited amount of time in the event of a fire, depending on severity.

4.5 Quarantine areas for unacceptable waste

The Facility is subject to detailed design, but it can be confirmed that, where appropriate, the quarantine areas will be in accordance with the requirements of the fire prevention plan (FPP) guidance, i.e. it will:

- hold at least 50% of the volume of the largest pile, row or block of containers at the Facility; and
- where practicable, have a separation distance of at least 6 metres around the quarantined waste.

Following completion of detailed design, plans showing the location of all quarantine areas will be developed. The plans will show the size of the quarantine area, clearance areas around the perimeter, and infrastructure associated with the quarantine areas.

Fire detection and protection measures (e.g. smoke / flame detectors, hose reel, sprinklers, or water cannon) will be installed in this area, the final design being subject to the recommendations of the final fire strategy completed during the detailed design phase of the project and agreed with insurers.

4.6 Storage within buildings

The detailed arrangements for waste storage are explained within Section 3.1, but it can be confirmed that all incoming wastes and residues following processing will be stored within buildings.

As part of the detailed design and construction of the Facility, the fire system design will be designed and installed by a suitably qualified and experienced fire engineering company, which employs appropriately qualified persons. The system will be developed in accordance with NFPA 850, which is an industry standard for fire protection systems for power generating facilities, the local fire officer, the fire risk insurers and any relevant standards and codes of practice. Where appropriate, waste storage areas will be designed with automatic fixed fire detection and suppression systems.

4.7 Shutdown

The duration of planned shutdowns will vary significantly, dependent on the nature of the work required, and typically will not extend beyond four weeks. The nature of a planned shutdown allows the Facility to minimise waste deliveries prior to the shutdown. During periods of shutdown, the waste within the bunker will be maintained at suitable levels. In the event that the Facility is not able to receive waste, due to an unplanned incident forcing a full shut-down of the Facility, incoming waste deliveries will be stopped and/or diverted to a suitable waste management facility.

When any waste treatment processes are shut down, whether it is planned or unplanned, both engineered fire detection controls and procedures will be implemented to minimise the risk of a fire within waste storage areas. The controls implemented during shutdown will be dependent on whether combustion fans are operational, and thus include either the opening or closing of louvers in the bunker to seal the area, and the use of an odour abatement system.

The frequency of inspection of waste storage areas (and other parts of the site) will be increased during a full shutdown, and a checklist utilised to ensure a complete record of issues and comments that may require further action, assessing the presence of dust, odours and hotspots. The operation of all thermal monitoring equipment will be maintained during all periods of shutdown where there is waste within the bunkers.

4.8 Active fire fighting

The fire-fighting system on site will be subject to detailed design. The main features of the fire system are described in the following sections.

4.8.1 Fire prevention standards

Where appropriate, the Facility will be designed and operated in accordance with the relevant fire prevention and detection standards, or alternative recognised international standards where they are available, including but not limited to the following:

- BS EN 671: Fixed fire-fighting systems;
- BS 5266: Emergency Lighting;
- BS 5446: Automatic Fire Alarm Systems;
- BS 5839: Fire Detection and Alarm systems for buildings;
- ISO 6182: Fire Protection – Automatic Sprinkler Systems;

- ISO 6183: Fire Protection Equipment – Carbon Dioxide Systems;
- CIBSE Guide Volume E, Fire Engineering, 2003;
- BS EN 15004: Fixed Firefighting systems – Gas extinguishing systems;
- BS EN 12845: Fixed firefighting systems – Automatic sprinkler systems – Design, installation and maintenance;
- BS 5306: Fire extinguishing installations and equipment on premises;
- BS 5588: Fire Precautions in the design, construction and use of buildings (only in as much as referred to in the Building Regulations);
- BS 9990: Non-automatic fire-fighting systems in buildings – Code of practice;
- BS 9999 - Code of Practice for Fire Safety in the design, management and use of Buildings; and
- Building Regulations, in particular Approved Document B, Volume 2 – Buildings other than dwelling houses, Section B5, Access and facilities for the fire service.

4.8.2 Fire detection systems

There will be a fire detection and alarm system which will cover all of the waste processing areas within the Facility. The fire alarm systems will include the following:

- local detectors/transducers and call points;
- sounders/high intensity flashing beacons;
- cabling and containment systems;
- local control and indication panels; and
- remote control and indication panel (incorporating integral printers) will be in the control room.
- All fire detection systems shall be installed in accordance with BS 5839, Part 1 (2002) and subsequent amendments to give level P1 + M coverage in accordance with the requirements of the Loss Prevention Council ("LPC") guidance. In low fire risk areas, such as the Boiler Hall, the requirements for a P1 detection system may be relaxed.

In areas which are identified as having a low fire risk, proposed detection method(s) will be agreed with the requirements of the fire service and fire risk insurer. The fire detection, protection and alarm systems will comply with the requirements of the fire service and fire risk insurer. All fire detection systems will be design, installed and maintained in accordance with an appropriate UKAS-accredited third-party certification scheme.

The following fire detection systems will be incorporated into the design of the Facility:

1. Tipping hall fire detection will be provided by flame detectors or infrared cameras in accordance with an appropriate risk study.
2. Waste bunker fire detection will be provided by thermal imaging cameras and/or flame detectors which will be fixed around the perimeter of the bunker with automatic scanning of the entire fire zone. The thermal imaging cameras will provide a continuous thermal ‘map’ of the surface of the waste within the bunker. The thermal mapping will be displayed in the control room and will be used by the crane operator to manage temperatures within the bunker. The staff within the control room, as well as the crane operator, will be trained in the identification and implementation of corrective measures in the event of elevated temperatures within the bunker. The thermal imaging cameras will enable the crane operator and/or the control room staff to identify and react to hot areas in the bunker and undertake mixing or feeding of waste as appropriate. In extreme cases, the use of firewater cannons which covers the entire extent of the waste bunker to extinguish any smouldering/burning waste may be required.

- Water cannons and manual fire hoses are considered to be the primary means of fighting a bunker fire.
- Following activation of the high temperature alarm in an area within the bunker, the area with an elevated temperature can be readily identified and, if possible, extinguished based on operator action through mixing within the bunker or fed into the hopper to be incinerated. High temperature alarms in other UK waste incineration plants operate with a trigger temperature of approximately 90°C. For the Facility, this is subject to detailed design, and will be set in consultation with the Fire Service.
- Following activation of the high-high temperature alarm in an area within the bunker, the area with an elevated temperature will be targeted and the firewater cannons will be activated to reduce the temperature in the area where self-heating has occurred. High-high temperature alarms in other UK waste incineration plants operate with a trigger temperature of approximately 120°C. For the Facility, this is subject to detailed design, and will be set in consultation with the Fire Service.
- The system can be designed so that the trigger temperature for the fire detection systems can be amended if required from operational experience.
- Furthermore, the crane will be sized appropriately so that the time for waste mixing, feeding and management is within an acceptable time range for feeding waste to the feed hopper.

3. Feed hopper area fire detection will be provided by the waste feed hopper supervision camera and firefighting nozzles to the feed hoppers if required.
4. In the boiler house the main cable trays and other fire sensitive areas will be protected with a sprinkler system.
5. Electrical rooms with significant concentrations of electrical equipment will be fitted with fire detection systems.
6. Oil type transformer protection will provide complete water spray impingement on all exposed exterior surfaces. Water spray application shall include the conservator tank, pumps, etc.
   - Dry-type transformers will be used for indoor transformer installations. If appropriate, enclosures for dry-type transformers will be provided with suitably designed fire detection systems.
7. The fire sensitive areas of turbine-generator and ancillaries will be protected by a dedicated fire detection and automatic sprinkler fire protection system.
8. Procedures will be developed in the operation of the fire detection systems. Training will be provided to the relevant staff in the different fire detection systems. Training records in the operation of the fire detection systems will be retained on-site.
9. All automatic fire detection and alarm systems will be designed and maintained by a suitably qualified, experienced and registered fire protection engineer.
10. Detailed design calculations, risk assessments and system drawings to demonstrate compliance with the requirements of the building control officer, fire officer and the insurer's requirements will be produced during detailed design.
11. It will be the responsibility of the operators and shift managers to monitor fire alarms.

4.8.3 Fire suppression systems

There will be a fire suppression system installed in the locations considered by the fire strategy and NFPA 850 to be at risk of fire.

The automatic fire suppression systems will be designed and maintained by a suitably qualified, experienced and registered fire protection engineer. The fire suppression systems will be covered by a recognised (typically UKAS) third party certification scheme.

Detailed design calculations, risk assessments and system drawings to demonstrate compliance with the requirements of the building control officer, fire officer and the insurer's requirements will be produced following detailed design.

4.8.4 Alternative fire detection and suppression measures

In addition to the fire detection and suppression systems identified in Sections 4.8.2 and 4.8.3, the design of the Facility will include a number of 'additional measures' to prevent the spread of fire, such as fire walls (Section 4.4), fire hose reels and wet/dry riser system (Section 4.8.7), and fire extinguishers (Section 4.8.9).

Whilst it is acknowledged that the Facility is strictly not design in accordance with all of the requirements of the FPP guidance in relation to the provision of water for firefighting provision (refer to section 4.8.5). However, the overall design of the Facility, including the fire detection and fire suppressions systems, where applicable, have been designed to achieve the requirements of the guidance, namely:

- minimising the likelihood of a fire happening;
- aim for a fire to be extinguished within 4 hours; and
- minimise the spread of fire within the site and to neighbouring sites.

In addition, in the event of a significant fire within the waste bunker, the plant can be shut-down which will include the shut-down of the induced draft (ID) fan and the extraction of combustion air from within the bunker. The plant shut-down will reduce the risk of fire spread between the 'fire compartments' within the Facility.

4.8.5 Provision of firewater

The Facility will have a firewater storage tank designed in accordance with the requirements of BS 5306.

The firewater storage tank will be connected to the local water supply and will be installed with a suitable system to prevent freezing. The tank will be fitted with a local external water level indicator as well as with remote water level control and level alarm indication to the distributed control system (DCS).

The automatic fixed fire suppression systems for the Facility will be designed in accordance with the requirements of ACE (ACE Technical Risks - Engineering Information Bulletin Guidance Document) and NFPA 850.

The firewater tank will be designed to ensure the required firewater capacity is available for fire protection at all times.

It is estimated that the size of the firewater tank will be approximately 1,000 to 1,500 m^3. The exact size of the firewater tank will be confirmed following detailed design. When specifying the sizing for the firewater tank, it will be based on early fire detection and automatic fire suppression systems in the waste reception and storage areas such that any fire can be rapidly contained and extinguished.

The FPP Guidance requires a supply of firewater of 2,000 l/min for 3 hours for a 300 m^3 pile of waste but this is based on an open pile of waste with free run off, rather than storage in a bunker which

contains the water. For a waste bunker with a storage capacity of 6,700 m^3, the guidance implies the need for an 8,040 m^3 fire water tank, which is excessive.

It is acknowledged that the provisions for the supply of firewater at the Facility are not in accordance with the 2,000 litres/minute for 3 hours as required by the EA's FPP guidance. The waste bunker is a contained concrete structure, with 2-hour rated fire walls (refer to section 4.4). The provisions for fire-fighting in this area will be in accordance with NFPA 850 and as required by the fire risk insurers. In addition, the use of foam as an additive in the firewater system will reduce the quantity of water required for firefighting. However, the use of foam will be subject to detailed design.

The firewater tank will be designed to ensure the required fire water capacity is available for fire protection at all times

It is proposed that the designs of the systems for the provision and containment of firewater are confirmed via a pre-operational condition.

4.8.6 Bunker cannons

Thermal cameras will be installed over the waste reception bunker to detect any hot spots in the waste. If the temperature of any hot spot exceeds a defined set-point (assumed to be 90°C, however this is subject to agreement with the fire risk insurers), water cannons installed around the bunker can be used to prevent the potential for fire spreading within the bunker.

The cannons will be located in positions to optimise the horizontal and vertical coverage of the water spray(s) for total firefighting suppression across the entire area of the bunker.

Through detailed design of the waste bunker, the number and position of the fire monitors and cannons will be established, alongside the manual and/or automatic remote-control systems. Thermal imaging screens will be installed within the control room.

4.8.7 Fire hose reel system and wet riser system

Hose stations will be designed in accordance with NFPA 14, Standard for the Installation of Standpipe, Private Hydrants and Hose Systems, or BS equivalent. Fire hydrant systems equipment will be provided at strategic positions within the Facility for firefighting in fire risk areas.

For firefighting purposes, hose reels and extinguishers where appropriate will be provided within the buildings. Upstream connection of fire hose reels shall be as a minimum with 80 mm diameter pipe. A minimum 2.5 bar(g) pressure shall be maintained at all times in the fire hose piping system with 4 fire hose reels in simultaneous operation.

The positioning of hose points will take into account the following:

- location and physical protection as to avoid potential damage by vehicles;
- size and number to be determined for the specific works layout (e.g. push wall positions);
- ease of use, maintenance, and storage, such as through the use of continuous-flow, non-collapsible hose reels; and
- protection from freezing in unheated areas.

Following detailed design of the Facility, a plan identifying the location of the fire hose reels will be developed.

4.8.8 Fire hydrants and mains

Fire hydrants will be designed in accordance with NFPA 14 Standard for the Installation of Standpipe, Private Hydrants, and Hose Systems (or BS equivalent), and will be connected to a ring main at strategic positions around the Facility to provide firewater supplies to external fire risk areas. The fire hydrants will be designed in accordance with the requirements of the Building Regulations and the fire service; and spaced at no greater than 90 m apart and within 12 m of the building.

The location of hose reels and hydrants will be subject to detailed design and will be agreed with the fire insurers and the fire officer. The positioning of fire hydrants will take into account:

- location and physical protection as to avoid potential damage by vehicles;
- size and number to be determined for the specific layout; and
- protection from freezing.

The fire hydrants will be fed from the fire water storage tank and maintain the required pressure in accordance with the requirements of the fire service.

Following completion of detailed design, a plan identifying the location of the fire hose reels and hydrants will be developed. An indicative drawing showing the location of the fire hydrants is presented in Appendix A.5.

4.8.9 Fire extinguishers

Fire extinguishers will be strategically located throughout the operational areas in accordance with the requirements of BS 5306-3.

The location of the fire extinguishers will be subject to implementation of the recommendations of the fire officer for the Facility. Following completion of detailed design, a plan identifying the location of the fire extinguishers will be developed and presented in Appendix A.

4.8.10 Containment of firewater

Drainage and prevention of flooding of equipment and the fire retention will be accomplished by installation of one or a combination of:

- floor drains;
- floor trenches;
- open doorways or other wall openings;
- kerbs for containing or directing drainage;
- equipment pedestals; and
- pits, sumps, and sump pumps.

The provisions for drainage and any associated drainage facilities will be sized to accommodate the concurrent flow due to operation of the following components:

- the spill of the largest single container of any flammable or combustible liquids in the area, where the bund around oil tanks should be large enough to contain the oil and the water from suppression systems;
- the maximum expected number of fire hose lines operating for a minimum of 10 minutes; and
- the maximum design discharge of fixed fire suppression systems operating for a minimum of 10 minutes.

There are three different types of firewater flows which will be required to be contained if there was a fire at the Facility:

1. Firewater resulting from treating fires in the bunker and tipping hall area. This firewater is routed to the bunker which is watertight and hence can contain large amounts of firewater.
2. Firewater from inside any other process building or from the IBA storage area. Such firewater is expected to be extremely rare and small in quantity so only small amounts of firewater will arise. This drainage will be contained, to prevent contaminated water discharging off-site.
3. Firewater from outside any building. Such firewater will be contained in the site drainage systems. The drainage system will be installed with a penstock valve which will prohibit the discharge of contaminated surface water from being discharged off-site. The water used for fire-fighting will be sampled and analysed to identify whether it is suitable to be used as process water, or if treatment/disposal is required. If the firewater is considered to be contaminated, it will be transferred off-site, via tanker, to a suitably licensed waste management facility.

4.8.11 Contingency during an incident

Emergency procedures will be developed during the construction and commissioning phase. The emergency procedures will include, but not be limited to:

- fire identification and reporting procedures;
- an evacuation plan;
- emergency communication procedures;
- responding to chemical spillages;
- containment of firewater;
- requirements for diverting incoming waste; and
- Notification of any adjacent residential properties and businesses which may be impacted by the incident.

All staff and contractors will be trained in the emergency response procedures for the waste combustion process as well as the site-wide emergency procedures. Where specific responsibilities are given to specific staff, training will be provided to those employees. Training records in the emergency response procedures for all staff and contractors will be retained on-site.

The effectiveness of the emergency response procedures will be reviewed following any emergency incidents on-site. Where appropriate the procedures will be updated, and staff trained in the updated procedures.

A copy of the emergency procedures will be maintained at the gate house, or other suitable location, and will include the fire system mimic panel to allow co-ordination of the emergency response to a fire in the event that the main offices are unavailable.

On a periodic basis, assumed to be twice a year, tests of the emergency procedures will be undertaken. The intention of the tests is to verify that all staff and contractors are aware of the emergency procedures. Following all tests, the implementation of the procedures will be reviewed. If appropriate, the procedures will be amended, or additional training provided to all staff and contractors.

In the event of an incident resulting in the Facility not being capable to receive waste, waste deliveries to the Facility will be stopped or diverted to a suitably licensed waste management facility.

Deliveries of waste to the Facility will not be recommenced until it has been deemed safe for the Facility to be restarted following the incident.

4.8.12 Actions following a fire

Following a fire which requires the presence of the emergency services; materials, building structures, furnishings, vehicles, equipment and raw materials could be damaged. Once the fire had been fully extinguished and the emergency services given approval to enter the Facility, an assessment will be undertaken by the management team for the Facility, insurance assessors, structural engineers and fire damage/salvage specialists to assess the extent of the damage.

Once a full inventory of the damage and equipment has been completed under the strict supervision of specialist structural engineers, any building or structure will be made safe. Severely damaged equipment or building materials will be removed from site by a licenced waste/scrap company.

Building structures that are deemed safe will be cleaned, as necessary.

Waste within the bunker which is not suitable to be incinerated will be backloaded from the bunker into HGV's and removed from site by a licenced waste carrier. Affected areas will be cleaned and washed before equipment and structural repairs will take place.

Incoming waste deliveries will be prevented, with incoming wastes stopped or diverted to alternative waste management facilities, until it was concluded safe to start-up the Facility.

Appendices

A Plans and drawings

A.1 Site location plan

A.2 Site layout plan

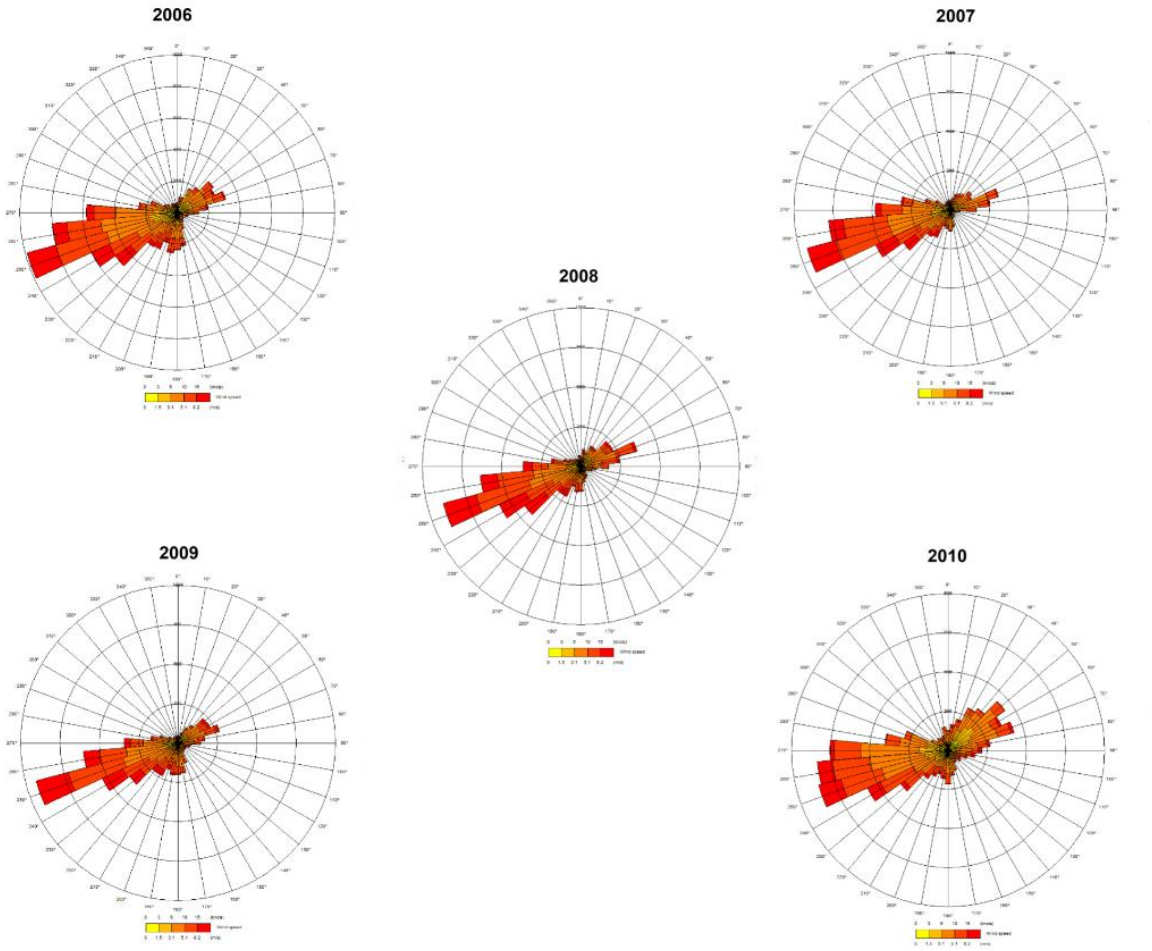
A.3 Waste storage areas plan

A.4 Access points around the perimeter to assist fire-fighting

A.5 Indicative locations of fire hydrants and water supplies

A.6 Indicative locations of fire walls

B Wind roses



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