



Environmental Permit

The Environmental Permitting (England & Wales) Regulations 2016

Cannock Chase Crematorium,
Norton Road,
Heath Hayes,
Cannock. WS12 3HJ

Regulated Activity: Cremation of Human Remains

Permit Number: EPR 18337

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Table 1: Permit Status log

Detail	Date	Comment
Date first authorised	29 January 2021	Ref: EPR 18337

INTRODUCTORY NOTE

These introductory notes are not Environmental Permit conditions; however they do provide useful information about the Environmental Permitting Regulations:

ENVIRONMENTAL PERMITS

The following Permit is issued under Regulation 13 of the Environmental Permitting (England and Wales) Regulations 2016 (S.I.2016/1154) (“the EP Regulations”), (“the EPR”) operate an installation carrying out one or more of the activities listed in Schedule 1, Section 5.1 Part B (b) of those Regulations, to the extent authorised by the Permit:

Cremation of human remains

Conditions within this Permit detail Best Available Techniques (BAT), for the management and operation of the installation, to prevent, or where that is not practicable, to reduce emissions. In determining BAT, the Operator should pay particular attention to relevant sections of the LAPPC Process Guidance note PG5/2(12), and any other relevant guidance. Techniques include both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned. Note that the Permit requires the submission of certain information to the Regulator, and in addition, the Regulator has the power to seek further information at any time under Regulation 60 of the EPR Regulations provided that the request is reasonable.

PUBLIC REGISTERS

Information relating to Permits, including the application, is available on public registers in accordance with the EPR. Certain information may be withheld from the public registers where it is commercially confidential, or if it is in the interest of national security to do so.

VARIATIONS TO THE PERMIT

The Regulator may vary the Permit in the future, by serving a variation notice on the Operator. Should the Operator want any of the conditions of the Permit to be changed, a formal application must be submitted to the Regulator (the relevant forms are available from the Regulator). The Status Log that forms part of this introductory note will include summary details of this Permit, variations issued up to that point in time and state whether a consolidated version of the Permit has been issued.

TRANSFER OF THE PERMIT OR PART OF THE PERMIT

Before the Permit can be wholly or partially transferred to another Operator, an application to transfer the Permit has to be made jointly by the existing and proposed Operators. A transfer will not be approved if the Regulator is not satisfied that the proposed Permit holder will be the person having control over the operation of the installation, or will not comply with the conditions of the transferred Permit. In addition, if the Permit authorises the Operator to carry out a specified waste management activity, the transfer will not be approved if the Regulator does not consider the proposed Permit holder to be a ‘fit and proper person’ as required by the EPR.

CONTACTING THE REGULATOR

Please quote the Permit number if you contact the Regulator about this Permit. To give a notification under this permit, the Operator should telephone 01543 262621 or any other number notified in writing by the Regulator for that purpose.

THE INSTALLATION AND DESCRIPTION OF ACTIVITIES UNDERTAKEN

The following description of the activities authorised by this permit do not form permit conditions, however it does provide useful information about the activities undertaken:

The installation is centred at Ordnance Survey map reference location SK018098 at a site off Norton Lane, Heath Hayes, Staffordshire.

The primary business is the cremation of human and burial of remains. A single building houses one chapel, office accommodation and a crematory containing the cremation equipment.

A single cremator has been installed, which is fitted with emissions to air abatement equipment.

Cremation Process

In most cases, coffins containing human remains will be delivered to the crematorium chapel and after a short service are transferred to the crematory prior to being cremated. The coffin will then be placed on a coffin charging machine ready for insertion into the cremator. (In some instances, the coffins will be taken directly to the crematory with no service.)

Once the cremators have reached the required operating temperature, the cremator's charging door is opened and the coffin is inserted into the primary combustion chamber. The primary chamber will have been preheated to around 760°C prior to charging, as this is sufficiently hot to initiate combustion of the coffin without the use of the main chamber burner. For approximately 40 minutes, combustion of the remains is solely dependent on the: residual heat in the cremator, the calorific content of the charge and careful control of combustion air. After the initial period, the main chamber temperatures start to fall, at which point gas burners are used to reduce what remains of the charge to a calcinated residue. The overall cremation time can vary between 1 to 3 hours depending upon the size of the coffin, but typically, the average time for the cremation process is around 90 minutes.

As soon as all combustion has been completed, the calcified remains are raked down into an ash chute where cold air is passed over them for approximately 60 minutes to cool them. Once cool, the remains are transferred from the cremator to a cremulator, which reduces the remains to a granular state ready for transfer to a polyurn or similar suitable receptacle. The final cremated remains are normally either: removed from site, interred on site or strewn on site.

Equipment

Most of the cremation and emissions abatement equipment is located inside the crematorium, although the secondary flue gas air cooler is located outside, at the rear of the building. Detailed plans are provided in **Schedule 2 – Plans**.

It is intended that eventually the crematorium will install two new Mathews Novus cremators both of which will be equipped with emission to air abatement equipment. The first cremator was installed in 2020 along with the abatement plant. It is intended that the crematorium will carry out 100% of all cremations via the abatement system from the start of operations.

The cremator is a single ended unit i.e., both coffin charging and ash removal takes place at the same end of the cremator. The cremator is capable of accommodating large coffins up to 1040mm (40") wide.

The cremator has two propane fired burners, one for the main combustion zone and a second serving the secondary combustion chamber. Although intended for operation with the abatement plant, the cremators

are capable of operating in accordance with the Process Guidance Note conditions for unabated cremator operations and as such are capable of achieving a 2 second secondary chamber residence time whilst flue gases are held at 850°C.

The cremator has a Mathews Environmental developed PLC control system is capable of operating in conjunction or independently of the abatement plant controls.

The abated cremator installation will eventually comprise: two cremators, two flue gas coolers; one reagent dosing station, and a single fabric bag filter. Associated with the abatement plant will be a small plate heat exchanger and an external air blast/water cooler. The former recovers waste heat to provide space heating and the latter dumps the surplus heat generated by the cremation process to atmosphere. (The air blast cooler is a secondary cooler which operates in conjunction with the primary water/glycol cooled flue gas cooler.)

The abatement plant is designed to reduce emissions to air of: particulate matter, hydrogen chloride, mercury and dioxin and furans. The plant installed has sufficient capacity to ensure the emissions from two cremators running simultaneously will be below the PG5/2 (12) emissions limits specified for cremation operations. The system is designed to achieve the standards with either one or two cremators in use.

The hot flue gases leaving the cremators at >800°C are ducted to a gas: water/glycol heat exchanger. The unit transfers the heat in the hot flue gas to a water / glycol liquid coolant, thereby reducing flue gas temperatures to approximately 150° - 170 ° C. Once the flue gas temperature has been lowered to this level, an active reagent is added to the flue gas and both components are allowed to mix prior to the flue gas being passed through a bag filter unit. The filter then removes both the particulate matter generated by the cremation process and the spent reagent, before the abated flue gas is returned to the main flue and discharged to atmosphere through a single crematorium chimney.

The reagent is supplied in powder form and contains activated carbon and sodium bicarbonate, in a ratio of approximately 20:80. This is added to the gas stream to remove/reduce the emissions of: mercury, hydrogen chloride, and dioxin and furan.

The cremator works in conjunction with a flue gas cooler/heat exchanger which is a horizontally mounted shell and tube design. The hot flue gas from the cremator passes through tubes within the heat exchanger, whilst coolant is circulated around the tubes. The unit is sized to ensure the flue gas temperature into the abatement plant is within the plants operating limits, even when the cremator is operating at its maximum capacity. The coolant is essentially water based, but contains 25% glycol to: provide improved heat transfer performance, minimise corrosion problems, and provide frost protection for the external air cooler.

In some installations, flue gas coolers of this type have encountered operational problems due to fouled heat transfer surfaces which restrict the amount of heat that can be removed from the flue gases. Under these circumstances the abatement plant is liable to go into by-pass mode leaving the cremators to operate unabated. In this installation, the potential problem has been minimised by the installation of automatic tube cleaning equipment which should ensure that there is no significant drop in plant performance even with extended use. This cleaning system operates by regularly blowing compressed air through the flue gas tubes after cremations have been completed. The cleaning process is fully automatic and any material dislodged from the cooler tubes is carried through the exhaust duct to be collected in the filtration plant.

An air blast cooler is installed which operates in conjunction with the primary flue gas heat exchanger and its purpose is to remove heat from the primary heat exchanger coolant. This unit is a conventional, proven design, comprising a series of finned tubes, through which coolant from the flue gas cooler flows. Six fans blow air

across the fins to remove heat, with each fan operating independently according to demand. The coolant is circulated through the tubes at between 60°C and 90°C.

The particulate filter unit comprises a Dustoflex bag filter having a filter area of around 104 m². The PTFE filter material employed has good temperature and abrasion resistance properties and incurs a relatively low pressure drop. Collection efficiencies are good at 99% for particulate sizes greater than 0.6 micron. As with the primary heat exchanger, the bag filter unit incorporates a compressed air cleaning system which is controlled automatically in response to the pressure drop across the filter. This prevents the filter from becoming blocked and should ensure optimum plant performance. The particulate material from the bag filter is collected in a dust-tight 45-gallon (205 litre) container, which will be sealed to the filter during normal operation. When full, the spent reagent drum will be exchanged for an empty drum and the full drum sealed with a lid for on-site storage before collection by a licenced waste disposal company.

The gas flows through the abatement plant, controlled by means of an induced draught fan, located within the crematory. This fan is controlled by means of an inverter speed control unit which will vary fan speed in response to the suction requirements at the cremators.

All flue gases from the cremator are discharged from a single chimney located above the cremators.

The cremator secondary chamber design and operation is critical in reducing emissions of a number of pollutants and has been sized to provide a flue gas residence time of greater than 2 seconds at 850°C. This minimises emissions of: carbon monoxide, unburnt volatile gases and dioxin and furan. During abated operations, the secondary chamber temperature, is reduced to 800°C (as specified in the PG 5/2 (12). The decrease in temperature has no significant impact on emission of carbon monoxide or volatile organic compounds and any slight increase in emission of dioxin and furan are offset by the activated carbon added in the abatement process. The main charging door is interlocked to prevent charging until the specified secondary chamber temperature has been achieved.

A cremation can only take place once the cremator been preheated to ensure it has reached specified operating temperatures. In particular, the secondary combustion chamber has to reach an operating temperature at, or above, 800°C and this minimum temperature has to be maintained throughout a cremation cycle. (This condition is specified in the Process Guidance PG5/2 (12) 'Crematoria'.) This temperature has to be maintained whenever the cremator is operating in conjunction with emissions abatement equipment. Should, in the event of emergency, the cremator be required to operate unabated, the minimum secondary combustion chamber temperature has to be increased to 850°C.

Secondary chamber temperatures and oxygen levels will be recorded for both cremators. The abatement line will be equipped with emissions monitoring equipment for oxygen, carbon monoxide and particulate matter.

Ash processing

Once the cremated remains have cooled, they are removed from the cremator in an ash pan and transferred to an ash processor unit. The ash processor consists of both a cremulator & ash transfer cabinet (combined unit). The ash processor and the cremator ash pan are designed to be compatible, so ashes can be transferred directly from one receptacle to the other in order to minimise handling operations and any associated dust. Once the ashes are transferred to the cremulator, the unit is used to break up any bone fragments to produce a final granular material. During cremulator operation, the unit operates under negative pressure with air being drawn from the unit via a high efficiency, EU compliant HEPA Filter. Filtered air is returned to the crematory. On completion of the cremulation process, the remains are transferred directly to a collection container in order to minimise dust which might occur during the ash transfer process. Should the remains need to be transferred to a more bespoke receptacle, the ash processor units includes a ventilated ash transfer cabinet, which extracts air from its rear face in order to draw any dusts back into the filter mentioned above.

Emissions

There are no significant pollutant emissions to land or water from this process. The main pollutants to air from the cremation process comprise: -

- Particulate Matter (PM)
- Hydrogen Chloride (HCl)
- Carbon Monoxide (CO).
- Volatile Organic Compounds (VOC).
- Mercury (Hg)
- Dioxins and Furans (PCCD/F)
- Sulphur Dioxide (SO₂)
- Oxides of Nitrogen (NO_x)
- Carbon Dioxide (CO₂)

In the case of abated cremators, six of the above pollutants have emissions limits imposed under the terms of the Secretary of State's Guidance for Crematoria, PG5/2(12). These are:

- particulate matter
- carbon monoxide
- volatile organic compounds
- hydrogen chloride,
- mercury
- dioxins and furans.

The cremator and abatement equipment installed at Cannock Crematorium has been designed to ensure the required emissions performance is always achieved and for most pollutants the level of emissions will be well below the permitted level. This will ensure that the equipment will have minimal adverse impact on local air quality.

PERMIT

The Environmental Permitting (England & Wales) Regulations 2016

Permit number: EPR 18337

Cannock Chase Council ("the Regulator") in exercise of its powers under Regulation 13(1) of the Environmental Permitting (England and Wales) Regulations 2016 (S.I.2016/1154), hereby authorises:

Horizon Cremation (Cannock) Limited ("the operator")

Whose registered address is

50 Lothian Road,
Festival Square,
Edinburgh,
Scotland. EH3 9JW

Company Registration Number SC592889

To operate an installation at

Cannock Chase Crematorium,
Norton Road,
Heath Hayes,
Cannock,
Staffordshire. WS12 3HJ

To the extent authorised by and subject to the conditions of this permit

Signed

A rectangular box containing a handwritten signature in black ink. The signature appears to be 'M Edwards'.

Head of Environment and Healthy Lifestyles

The Proper Officer Designated to sign on behalf of the Council

Cannock Chase District Council

Dated

29 January 2021

CONDITIONS

The following conditions are legal requirements.

1. BEST AVAILABLE TECHNIQUES

- 1.1. The installation shall, subject to the conditions of this permit, be operated using the techniques, and in the manner described in the documentation submitted in the permit application, or as otherwise agreed in writing by the Regulator in accordance with the conditions of this permit.
- 1.2. The best available techniques shall be used to prevent, or where that is not practicable, reduce emissions from the installation in relation to any aspect of the operation of the activity which is not specifically regulated by any condition of this permit.

2. EXTENT OF THE INSTALLATION

- 2.1. The activities authorised by this permit shall not extend beyond the installation boundary, that being shown as edged in red on the site location plan in Figure 5.
- 2.2. The layout of the installation is shown as edged in red on the site plan detailed in Figure 4 and detailed in Figure 1 to Figure 3 in Schedule 2.

3. COMBUSTION CONDITIONS

- 3.1. The combustion conditions for the cremator shall comply with, and be monitored for the parameters and at the monitoring frequency set out in Table 2, Schedule 1.

4. EMISSION RELEASE POINTS

- 4.1. Emission to air shall only arise from the emission points specified in Table 3, Schedule 1.

5. EMISSION LIMITS & MONITORING

- 5.1. Activities shall comply with the emissions limits and provisions with regards to releases in Table 4 and be expressed at reference conditions 273K, 101.3 kPa, 11% oxygen v/v dry gas.
- 5.2. The limits for emissions to air from the cremator shall be monitored for the parameters, and at the monitoring frequency, set out in Table 4 for abated emissions. The emission limits shall not be exceeded. Suitable monitoring techniques must be agreed with The Regulator in advance and in writing.
- 5.3. Emissions from cremations shall, in normal operation, be free from visible smoke.
- 5.4. There shall be no offensive odour beyond the installation boundary as perceived by the Regulator.
- 5.5. All other releases to air, other than condensed water vapour, shall be free from persistent visible emissions.
- 5.6. All emissions to air shall be free from droplets.

- 5.7. In the case of abnormal emissions, malfunction or breakdown leading to abnormal emissions, the Operator shall:
- a) Investigate and undertake remedial action immediately, and:
 - b) Adjust the process or activity to minimise those emissions, and
 - c) Promptly record the events and actions taken.
 - d) Inform the Regulator as soon as possible, and no later than 24 hours, of any such event.
- 5.8. The introduction of dilution air to achieve emission limits is not permitted.
- 5.9. The Operator shall keep a record of quarterly gas consumption for inspection by the Regulator. Gas consumption shall be converted to CO₂ equivalent emissions using the following conversion equation:
- $$\text{Gas usage (kWh)} \times \text{conversion factor} = \text{kgCO}_2\text{e.}$$
- 5.10. All continuous monitoring readings shall be on display to appropriately trained operating staff.
- 5.11. Instruments, including those in condition 5.13, shall be fitted with alarms situated appropriately to warn the Operator of arrestment plant failure or malfunction.
- 5.12. The activation of alarms shall be automatically recorded.
- 5.13. All continuous monitors shall be operated, maintained and calibrated (or referenced in the case of filter leak devices) in accordance with the manufacturer's instructions, which shall be made available for inspection by the Regulator. The relevant maintenance and calibration (or referencing) shall be recorded.
- 5.14. Emissions concentrations must report as zero when the plant is off and there is no flow from the chimney stack. If required, a competent person shall confirm that zero is more appropriate than the measured stack concentration if there is no flow.
- 5.15. Any continuous monitor used shall provide reliable data for more than 95% of the operating time, (i.e. availability >95%). A manual or automatic procedure shall be in place to detect instrument malfunction and to monitor instrument availability.
- 5.16. Sampling points on new plant shall be designed to comply with the British or equivalent standards specified in Table 4.
- 5.17. Adverse results from any monitoring activity (both continuous and non-continuous) shall be investigated by the Operator as soon as the monitoring data has been obtained. The Operator shall:
- a) Identify the cause and take corrective action, and:
 - b) In line with condition 10.1, clearly record as much detail as possible regarding the cause and extent of the problem, and the action taken, and;
 - c) Re-test to demonstrate compliance as soon as possible; and inform the Regulator of the steps taken and the re-test results.

6. CONTROL TECHNIQUES

FEEDSTOCK

- 6.1. PVC or melamine shall not be used in coffin construction or furnishings.
- 6.2. Cardboard coffins shall not contain chlorine in the wet strength agent e.g. not using polyamidoamine-epichlorhydrin based resin (PAA-E).
- 6.3. Packaging for stillbirth, neonatal and foetal remains shall not include any chlorinated plastics.
- 6.4. Coffins containing lead or zinc shall not be cremated.

CREMATOR

- 6.5. The cremator shall be designed and operated in order to prevent the discharge of smoke, fumes or substances during charging.
- 6.6. The cremator shall be designed and operated to ensure complete combustion and shall be fitted with a secondary combustion zone.
- 6.7. The cremator charging system shall be interlocked to prevent the introduction of a coffin to the primary combustion zone unless the secondary combustion zone exceeds the temperature specified in condition 3.1 (row 1 of Table 2, Schedule 1) of this permit.

SECONDARY COMBUSTION CHAMBER

- 6.8. The manufacturer shall state the volume of the secondary combustion zone.
- 6.9. When re-bricking a cremator, the convolutions of the secondary combustion chamber shall be maintained and the volume of the chamber recalculated and restated. The Operator shall confirm that the gas residence time requirements can still be met.
- 6.10. The cremators and all ductwork serving the cremators shall be made and maintained gas tight if under positive pressure to prevent the escape of gases from the ductwork or cremator to the air.

ABATEMENT

- 6.11. The cremator shall be fitted and operated with a gas cleaning system for mercury abatement.
- 6.12. Where the gas cleaning system fails, the cremator may continue to be used for up to 48 hours to provide opportunity for the necessary repairs to be completed. The Regulator shall be notified immediately (preferably by fax or email).
- 6.13. The Operator shall have a written procedure, approved by the Regulator, for dealing with the failure of key arrestment plant (key arrestment plant is detailed in Table 5 in this permit), in order to minimise any adverse effects.
- 6.14. Emergency relief by-pass systems shall only be used:
- a) when the heat removal plant has failed and the abatement plant would be damaged, or;
 - b) during warm-up and shutdown, provided that compliance be demonstrated with the carbon monoxide limit.
- 6.15. In the event of the use of an emergency by-pass system during cremation:
- a) The failure, its cause and cure shall be recorded in the logbook, and;
 - b) The Regulator shall be notified immediately (preferably by fax or email).

RESIDUAL MATERIAL & OTHER PROVISIONS

- 6.16. Dusty filter wastes and wastes containing mercury shall be kept tightly contained for off-site disposal.
- 6.17. The remains in the cremator shall only be moved when calcination is complete.
- 6.18. The removal of ash and non-combustible residues from the cremator shall be undertaken carefully so as to prevent dust emissions via the flue.
- 6.19. Cremated remains shall be stored and moved (before processing in a cremulator) in a manner that minimises dusty emissions to air. Processed remains shall be stored in covered containers.
- 6.20. A simple plan shall be drawn up for dealing with emergencies which give rise to mass fatalities, which should mainly address the holding of additional spares and consumables and the training of suitable numbers of staff.

7. REPORTING & NOTIFYING

- 7.1. The Operator shall, no later than the 1st of April each year, send the Regulator a certificate from the Crematoria Abatement of Mercury Emissions Organisation (CAMEO) or appropriate evidence from a comparable audited burden sharing arrangement or scheme which specifies:-
- a) The total number of cremations completed in the past calendar year;
 - b) The number of cremations completed in cremators fitted with operational mercury abatement equipment in the previous calendar year; and;
 - c) The number of cremations completed in the previous calendar year and the proportion of those subject to burden sharing arrangements whether or not money has or has not been paid for the benefit of abated cremations; and;
 - d) In cases where mercury abatement is fitted but fewer than 50% of cremations at the installation were undertaken in cremators fitted with it in the previous calendar year, the relevant information in both (b) and (c).
- 7.2. The Regulator shall be informed without delay, whether there is related monitoring showing an adverse result;
- a) If there is an emission that is likely to influence the local community, or;
 - b) In the event of the failure of key arrestment plant (key arrestment plant is detailed in Table 5), or;
 - c) In the event of the use of the abatement plant by-pass duct.
- 7.3. Every six months a report shall be submitted to the Regulator containing the following continuous monitoring data for carbon monoxide and, in respect of unabated emissions, particulate matter. The following data shall be submitted covering the period of a calendar month:
- a) Values that exceed the 95% limit for carbon monoxide (and particulate matter if appropriate) in that period, and;
 - b) 60-minute mean emission values that exceed the 100% emission limit carbon monoxide (and particulate matter if appropriate) in that period, and;
 - c) A list of the highest 60-minute mean emission values for each period, and;
 - d) The 95-percentile value for each period.
- 7.4. Every six months a report shall be submitted to the Regulator containing the following continuous monitoring data for temperature and oxygen:
- a) Secondary chamber entrance temperature monthly maximum and minimum (of 5-minute averages), and;
 - b) Secondary chamber exit temperature monthly maximum and minimum (of 5-minute averages), and;
 - c) Oxygen concentration, monthly minimum (of 5-minute averages).

- 7.5. Where any values have been exceeded in any monthly or three monthly reporting period, records shall be kept that identify the number of times that the limit was exceeded during the reporting period, the levels of the exceedance, and the time, date and cremation reference. This data shall be kept available.
- 7.6. The Operator shall notify the Regulator at least 7 days before any periodic or non-continuous monitoring exercise to determine compliance with emission limit values. The Operator shall state the provisional time and date of monitoring, pollutants to be tested and the methods to be used.
- 7.7. A report of the results of non-continuous emission testing shall be forwarded to the Regulator within 8 weeks of completion of the sampling. Adverse monitoring results shall be reported without delay, and investigated in accordance with condition 6.8.
- 7.8. The Operator shall seek the written agreement of the Regulator for any operational changes to this Permit, by way of variation, and in requesting a change shall include:
- a) A description of the nature of the proposed change;
 - b) The nature and quantity of any emission;
 - c) Details of the technology being applied to reduce such emissions, and associated emissions monitoring;
 - d) Any other relevant information.
- 7.9. Minor plant modifications are permissible as long as they do not contravene the operational requirements of the application or the Permit, do not affect releases to air, and are notified to the Regulator 14 days prior to making that change.
- 7.10. The Operator shall give written notification as soon as practicable (and at least 30 days) prior to any of the following:
- a) Permanent cessation of the operation of part or all the Permitted Installation;
 - b) Cessation of operation of all or part of the Permitted Installation for a period likely to exceed 1 year; and
 - c) Resumption of the operation of part or all the Permitted Installation after a temporary cessation of activities as above.
- 7.11. The Operator shall notify the following matters to the Regulator in writing within 14 days of their occurrence:
- a) Any change in the Operator's trading name, registered name or registered office address;
 - b) Any change to the particulars of the Operator's ultimate holding company (including details of an ultimate holding company where an Operator has become a subsidiary);
 - c) Any steps taken by the Operator going into administration, entering a company voluntary arrangement, being wound up or bankruptcy.

8. MAINTENANCE

- 8.1. The operator shall have the following available for inspection by the Regulator:
- a) A written maintenance programme for all pollution control equipment; and;
 - b) A record of maintenance that has been undertaken.
- 8.2. Written maintenance and cleaning programmes shall be made available to the Regulator with respect to pollution control equipment, including control instrumentation and the cremator secondary chamber, and ducts and flues, and abatement plant.
- 8.3. Flues and ductwork shall be cleaned to prevent accumulation of materials, as part of the routine maintenance programme.

9. TRAINING

- 9.1. All staff whose functions could impact on air emissions from the activity shall receive appropriate training on those functions. This shall include:
- a) Awareness of their responsibilities under the permit, and;
 - b) Steps that are necessary to minimise emissions during start up and shut down, and;
 - c) Actions to take when there are abnormal conditions, or accidents or spillages that could, if not controlled, result in emissions.
- 9.2. The Operator shall maintain a statement of training requirements for each post with the above mentioned functions and keep a record of the training received by each person for 36 months. These documents shall be made available to the Regulator on request.

10. LOGBOOK

10.1. The Operator shall keep records of inspections, tests and monitoring, including all non-continuous monitoring, inspections and visual assessments, collectively referred to as the logbook. The records forming the logbook may be written or electronic records, and shall be kept in accordance with condition 10.2.

10.2. The Operator shall ensure that all records required to be made by this Permit and any other records made by it in relation to the operation of the Permitted Installation shall:-

- a) Be kept on site
- b) be made available for inspection by the Regulator at any reasonable time;
- c) be supplied to the Regulator on demand and without charge;
- d) be legible;
- e) be made as soon as reasonably practicable;
- f) indicate any amendments which have been made and shall include the original record wherever possible; and
- g) be retained at the Permitted Installation, or other location agreed by the Regulator in writing, for a minimum period of 2 years from the date when the records were made, unless otherwise agreed in writing.

10.3. Any record not held on site shall be made available for inspection within one working week of any request by the Regulator.

EXPLANATORY NOTES

The following explanatory notes do not form permit conditions, however they do provide useful information about the environmental permitting regulations.

In relation to this Permit, the following expressions shall have the following meanings:

“Activity”	An activity listed in Part 2 of Schedule 1 to the EP Regulations which will form part of an EP installation or be a mobile plant.
“Best Available Techniques (BAT)”	Best available techniques means the most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent, and where that is not practical, generally to reduce emissions and the impact on the environment as a whole. For those purposes: "Available techniques" means those techniques which have been developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the cost and advantages, whether or not the techniques are used or produced inside the United Kingdom, as long as they are reasonably accessible to the Operator; "Best" means, in relation to techniques, the most effective in achieving a high general level of protection of the environment as a whole; "Techniques" includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned. Schedule 2 of the Regulations shall have effect in relation to the determination of best available techniques.
“The EPR / EP Regulation”	Means the Environmental Permitting (England and Wales) Regulations 2016 S.I. 2016 No.1154 and words and expressions defined in the EPR shall have the same meanings when used in this Permit save to the extent they are explicitly defined in this Permit.
“Change in Operation”	In relation to an installation or mobile plant, a change in its nature or functioning or an extension which may have consequences for the environment.
“Enforcement notice”	A notice served by a local authority to enforce compliance with the permit conditions or require remediation of any harm following a breach of any condition.
“Installation”	A stationary technical unit where one or more activities listed in Part 2 of Schedule 1 to the EP Regulations are carried out and any other location on the same site where any other directly-associated activities are carried out and any activities that are technically linked. The terms ‘regulated facility’ and ‘installation’ are, in effect, interchangeable for A(2) and B activities.
“Operator”	The person who has control over the operation of the installation/regulated facility (EP Regulation 7).
“Permit”	A permit granted under EP Regulation 13 by a local authority allowing the operation of an installation subject to certain conditions.
“Pollution”	Any emission as a result of human activity which may be harmful to human health or the quality of the environment, cause offence to any human senses, result in damage to material property, or impair or interfere with amenities and other legitimate uses of the environment (EP Regulation 2(1)).
“Revocation notice”	A notice served by the Regulator under EP regulation 22 revoking all or part of a permit.
“Permitted Installation”	Means the activities and the limits to those activities described in this Permit.
“Monitoring”	Includes the taking and analysis of samples, instrumental measurements (periodic and continual), calibrations, examinations, tests and surveys.
“MCERTS”	Means the Environment Agency’s Monitoring Certification Scheme.
“Fugitive Emission”	Means an emission to air or water (including sewer) from the Permitted installation that is not controlled by an emission limit imposed by a condition of this Permit.

“Regulator”	Means any officer of Three Rivers District Council who is authorised under Section 108(1) of the Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in Section 108(1) of that Act.
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Where any condition of this Permit refers to the whole or parts of different documents, in the event of any conflict between the wording of such documents, the document with the most recent publication date shall be taken to be the most appropriate document to be used.

Any person who is aggrieved by the conditions attached to a Permit can appeal to the Secretary of State for Environment, Food & Rural Affairs. Appeals must be received by the Secretary of State no later than 6 months from the date of the decision (the date of the Permit).

Appeals relating to installations in England should be received by the Secretary of State for Environment, Food & Rural Affairs. The address is as follows;

The Planning Inspectorate
Environment Team, Major and Specialist Casework
Room, 4/04 – Kite Wing
Temple Quay House
2 The Square
Temple Quay
Bristol
BS1 6PN

The appeal must be in the form of a written notice or letter stating that the person wishes to appeal and listing the condition(s) which is/are being appealed against. The following five items must be included;

- a) A statement of the ground of appeal;
 - b) A copy of any relevant application;
 - c) A copy of any relevant Permit;
 - d) A copy of any relevant correspondence between the person making the appeal (“the appellant”) and the Council;
 - e) A statement indicating whether the appellant wishes the appeal to be dealt with.
- By a hearing attended by both parties and conducted by an inspector appointed by the Secretary of State; or
 - By both parties sending the Secretary of State written statements of their case (and having the opportunity to comment upon one another’s statements).

At the same time, the notice of appeal and documents (a) and (e) must be sent to the Council, and the person making the appeal should inform the appropriate Secretary of State that this has been done.

- An appeal will not suspend the effect of the conditions appealed against; the conditions must still be complied with.
- In determining an appeal against one or more conditions, the Act allows the Secretary of State in addition to quash any of the other conditions not subject to the appeal and to direct the local authority to either vary any of these conditions or to add new conditions.

SCHEDULE 1 – OPERATIONS

Table 2: Combustion Conditions

Row	Parameter	Combustion provision	Type of monitoring	Monitoring frequency	Sampling / Measurement Standard
1	Temperature	- Minimum of 800°C (1073K) in the secondary combustion chamber - Minimum of 850°C (1123K) in the secondary combustion chamber when operating under emergency conditions without abatement	- Measure at the exit of the secondary combustion zone; measuring point should be at the last measuring thermocouple - Automatically record temperatures - Visual alarm when temperature falls below the minimum combustion provision limits of 1073K (800°C) and 1123K (850°C) under emergency conditions - Record alarm activations - Interlock to prevent cremator loading below 800°C.	Continuous	BS EN 16911-1
2	Oxygen	- Measured wet or dry, - minimum average 6% and - minimum 3%	- Record of concentration at outlet of secondary combustion zone; - Visual alarm and record alarm activations; - During discontinuous tests, continuous reference oxygen measurements should be at the same sampling location as the parameters tested.	Continuous	BS EN 14789

Note: The re-lining or re-bricking a cremator is unlikely to constitute a substantial change, particularly where the work improves emission control. Residence time will need to be demonstrated in the event of a full cremator re-build.

Table 3: Emission Release Points

Emission point reference	Emission source	Location of emission point
"A"	Cremator filtered gas flue	Crematorium chimney (10 m above ground level)
"B"	Cremator by-pass duct	Crematorium chimney (10 m above ground level)

Table 4: Emission Limits and Monitoring Requirements

Row	Parameter	Emission Limit	Reference Period	Monitoring Method	Monitoring Frequency	Sampling / Measurement Standard
1	Mercury	50 µg/m ³	In accordance with Environment Agency Monitoring Guidance ¹	Periodic	Annual	Sampling point - BS EN 13284-2 Measurement - BS EN 13211
2	Hydrogen Chloride (excluding Particulate matter)	30 mg/m ³	Hourly average	Periodic	Annual	Measurement - BS EN 1911
	Total particulate matter	20 mg/m ³ Hourly	average	Indicative Monitoring Filter leak monitor - Provide visual alarms and record levels and alarms - Set reference levels on commissioning (i.e. set levels at which alarms will activate) plus	Continuous plus	Measurement BS EN 13284-2
3	Total particulate matter	20 mg/m ³	Hourly Average	Instrument health check - i.e. service according to manufacturer's instructions plus	Annual plus	
	Total particulate matter	20 mg/m ³	Hourly Average	Periodic monitoring: Set reference levels for continuous emission monitor (CEM) (i.e. set signal output at which alarms will activate)	Every 3 years	Measurement - BS EN 13284-1
4	Carbon monoxide 100 mg/m ³	100 mg/m ³	2 x 30-minute averages	Qualitative monitoring: - Record data at 15 second intervals or less - Provide visual alarms and record alarm events plus	Continuous	Measurement - BS EN 15058
	Carbon monoxide	100 mg/m ³	2 x 30-minute averages	Periodic test: Validation of continuous emissions monitor (CEM) output through comparison with periodic test results	Annual	Measurement - BS EN 15058
5	Organic compounds (excluding particulate matter) expressed as carbon	20 mg/m ³	Averaged over an hour of cremation	Periodic Monitoring	Annual	Measurement - BS EN 12619
6	PCDD/F	0.1 ng/m ³ as ITEQ		Periodic Monitoring - As demonstrated by continuous monitoring of temperature, oxygen and flow parameters that apply during the dioxin tests - Interlock to prevent cremator loading unless those parameters are met	Upon commissioning of new or replacement cremators	Sampling point - BS EN 13284-2 Measurement - BS EN 1948 Parts 1,2 & 3
7	Particulate matter	50 mg/m ³ with no correction for oxygen concentration or water vapour.	N/A	Gross filter detection	Testing at commissioning	Sampling point - BS EN 13284-2 Measurement - BS EN 13284-1

Table 5: Key Arrestment Plant & Processes

Part of process	Control of:
Control of gas usage	Carbon dioxide
Cremator design	Minimise particulates in flue gases.
Low NOx burner	Oxides of nitrogen
Temperature control of secondary combustion chamber	Products of combustion
Hot flue gases reduced to < 170°C in flue gas cooler after secondary combustion chamber	Prevent reformation of dioxins and furans.
Introduction of active reagent into cooled gases at a controlled rate prior to bag plant.	- Charcoal - adsorption of dioxins and furans, and mercury. - Sodium bicarbonate for neutralisation of hydrogen chloride & SO₂ gases
Bag filter plant to collect residual particulates at 95% efficiency	Particulates, dioxins & furans, mercury, hydrogen chloride, SO ₂ ,

¹ <https://www.gov.uk/government/collections/monitoring-stack-emissions-environmental-permits>

SCHEDULE 2 – PLANS

Figure 1: Detailed Plan View

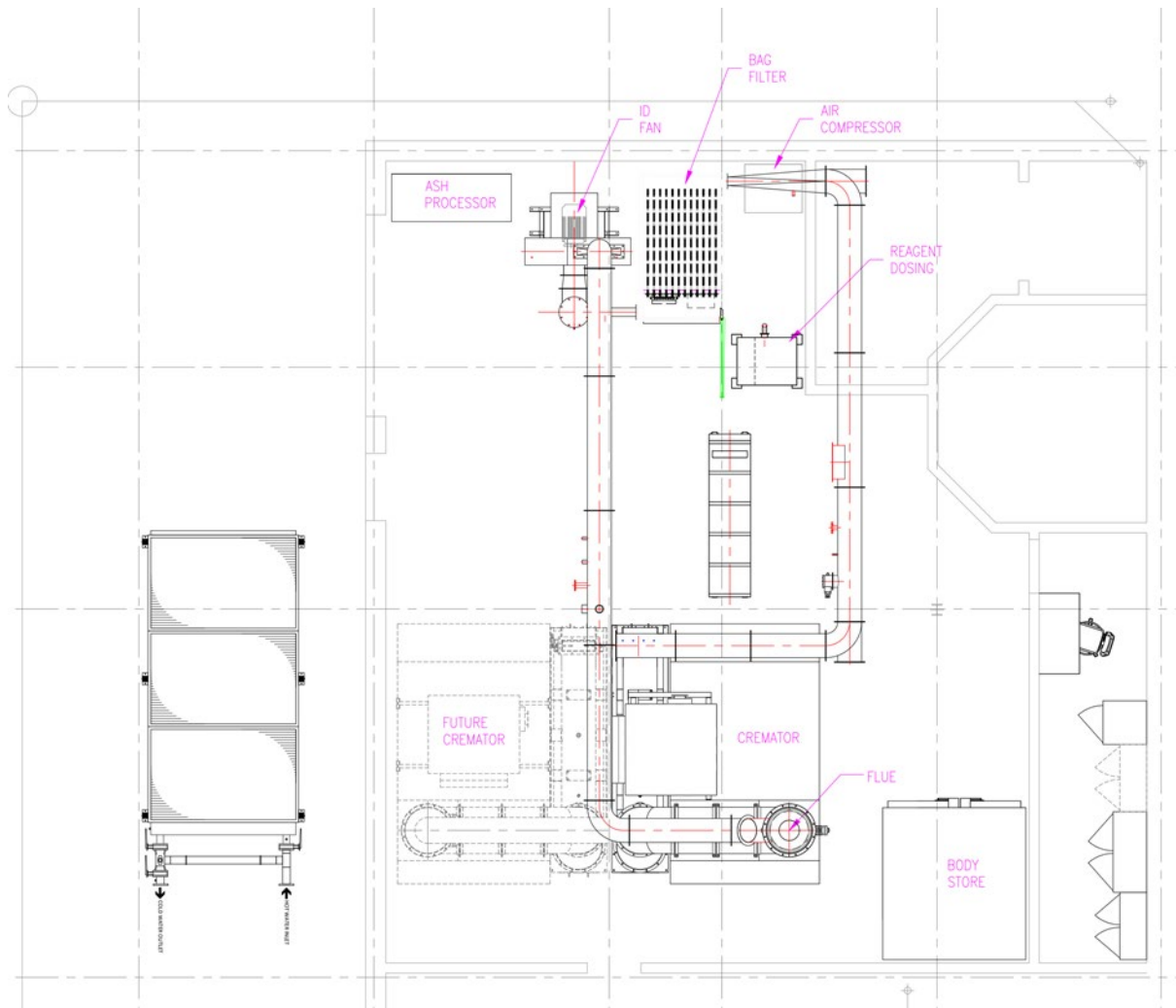


Figure 2: Detailed Side Elevation

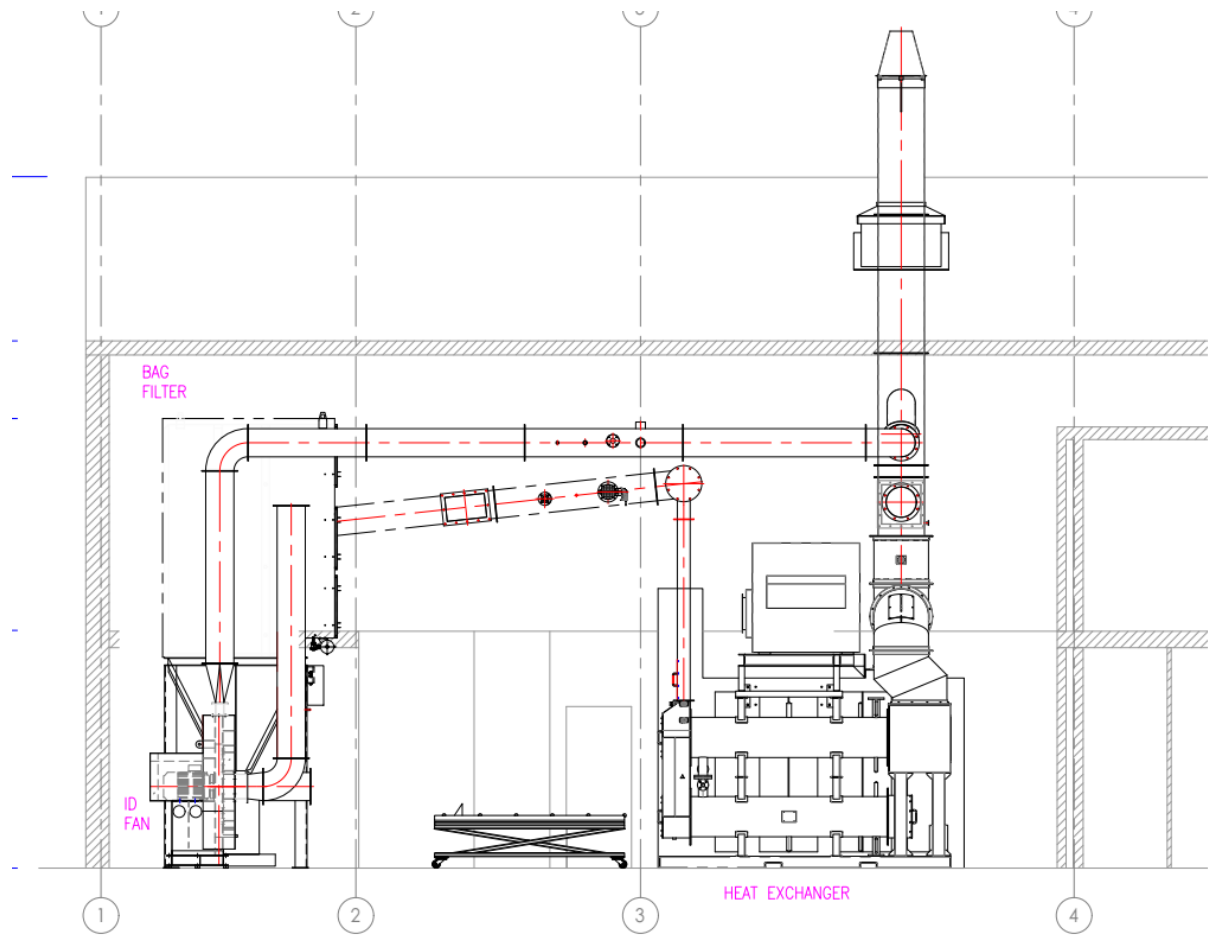


Figure 3: Detailed Sectional View

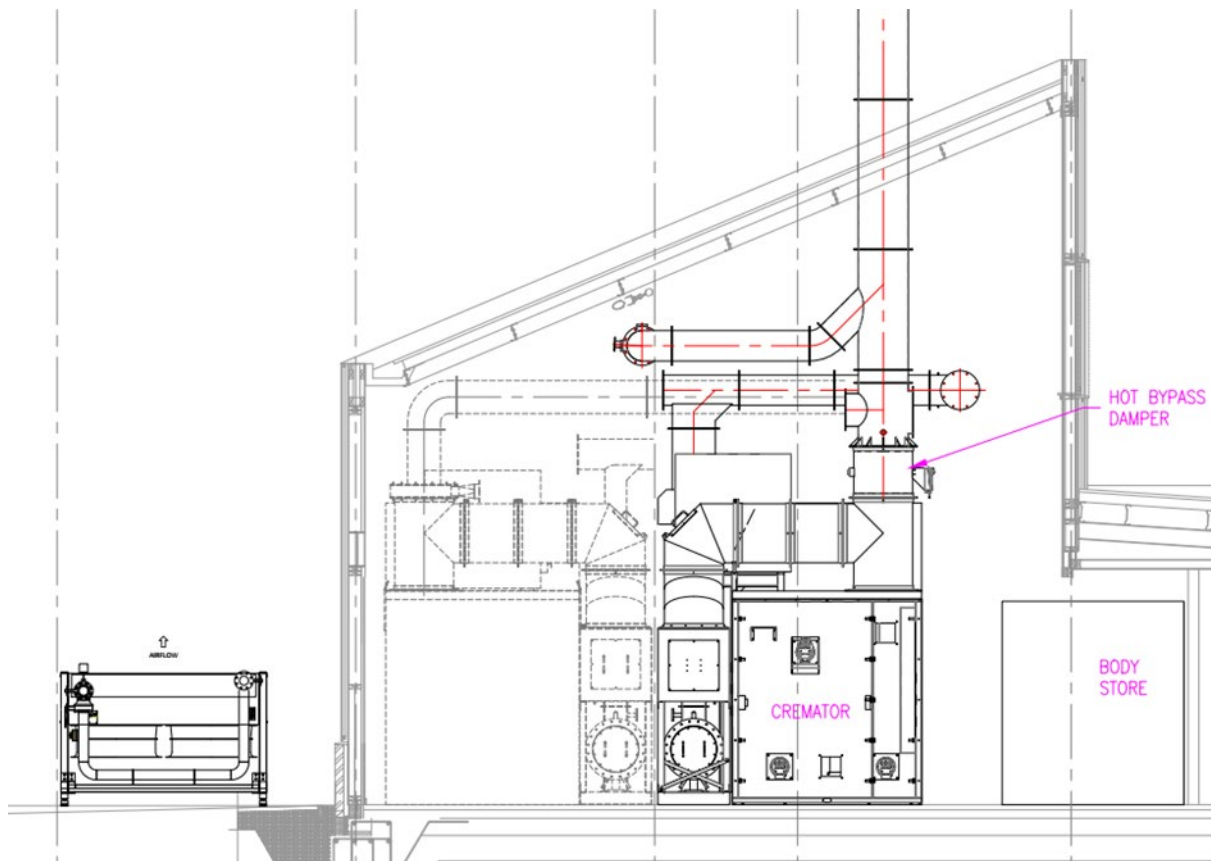


Figure 4: Site Layout Plan

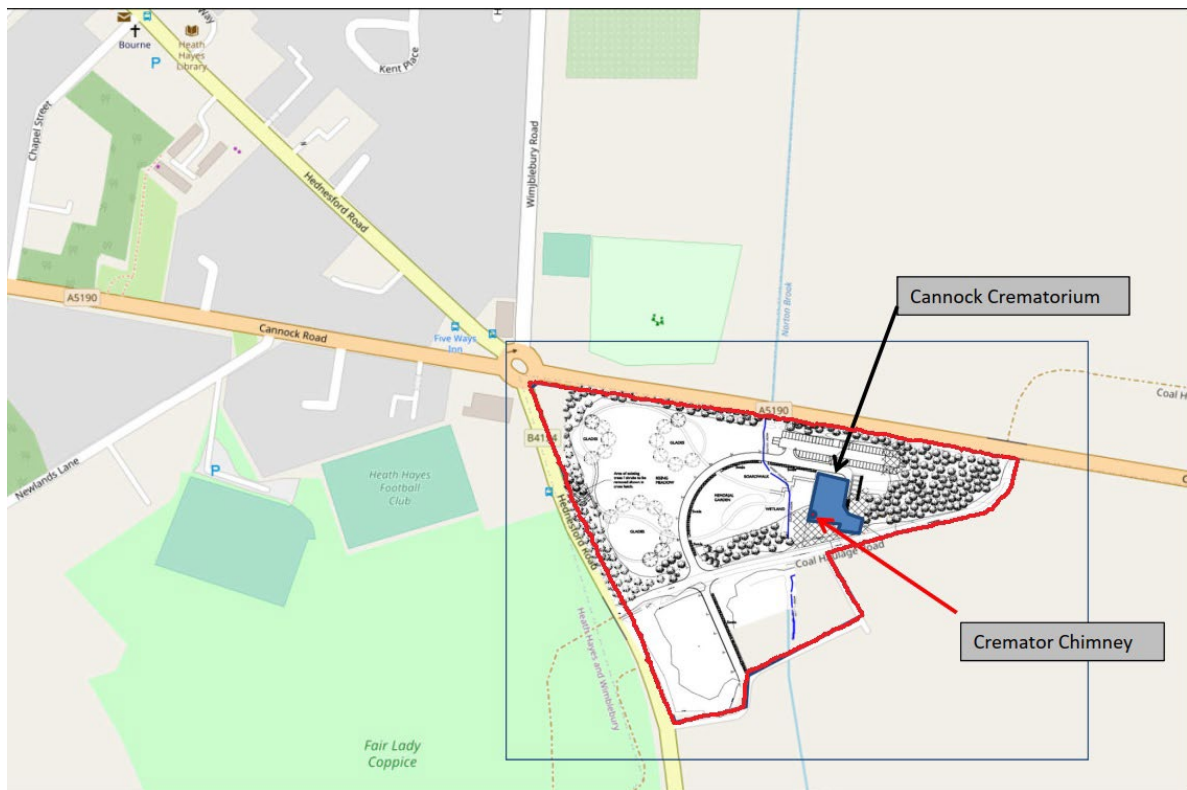
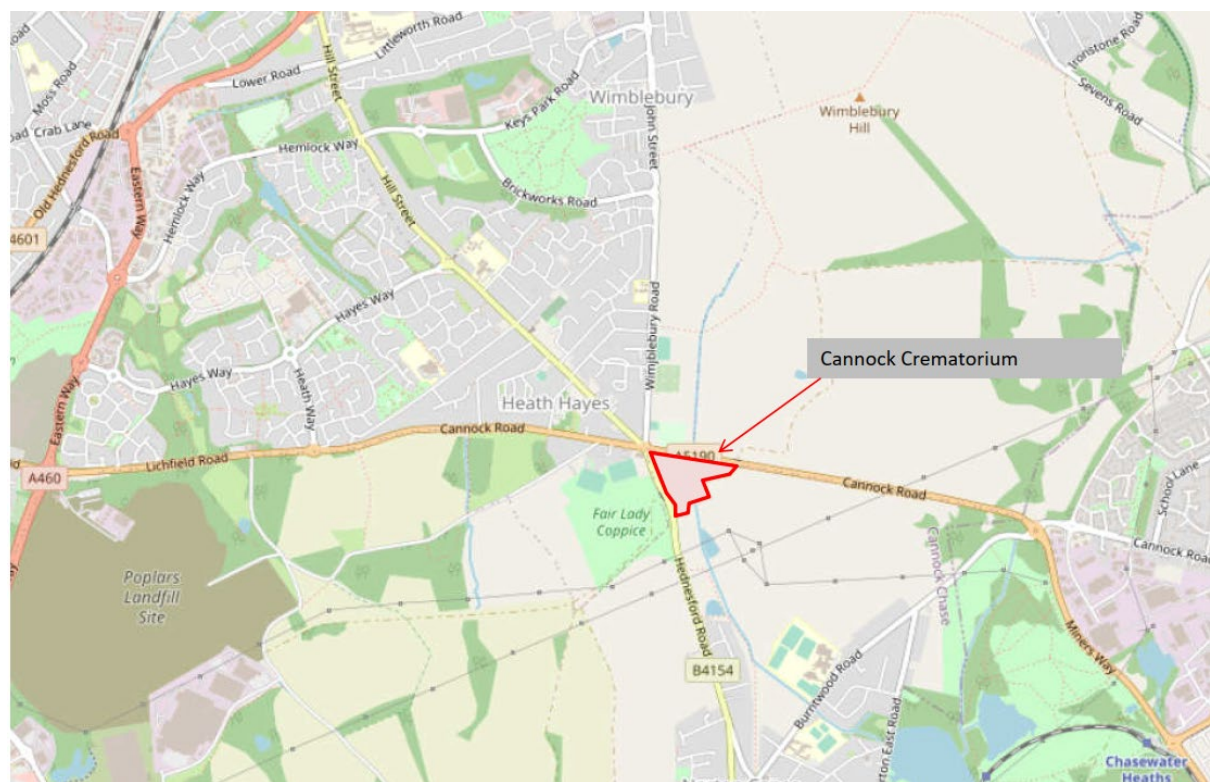


Figure 5: Site Location



END OF PERMIT