Permit with introductory note

The Environmental Permitting (England & Wales) Regulations 2010

SITA UK Limited

Avonmouth End of Life Plastics Facility
Bristol Resource Recovery Park
Merebank Road
Off - Kings Weston Lane
Avonmouth
Bristol
BS11 9FG

Permit number

EPR/HP3937FM

Avonmouth End of Life Plastics Facility
Permit number EPR/HP3937FM

Introductory note

This introductory note does not form a part of the permit

The main features of the permit are as follows. The facility will convert 6,000 tonnes per annum of waste plastics into approximately 6,000,000 litres of synthetic diesel, kerosene and light oil by means of a process using liquefaction, pyrolysis and distillation. There are two process lines each incorporating two pyrolysis chambers. A batch of molten waste plastic, is charged by an extruder into a heated sealed pyrolysis chamber that has been purged with nitrogen to eliminate all oxygen. Plastics in the chamber continue to be heated and pyrolysed in the absence of oxygen to produce hydrocarbon gases which are subsequently passed through a distillation column where the gases are condensed into Raw Diesel. This Raw Diesel is further refined in another distillation column where it is distilled into three main products, Road Diesel, Kerosene and a light oil fraction.

The process also produces some residual material (char) which is transferred off site to a suitably licensed facility. There is also an amount of the hydrocarbon gases (a syngas) from the initial distillation column, which is cleaned in a caustic scrubber prior to being burned as a fuel in a combustion chamber to provide the heat required for the batch pyrolysis chambers.

Process water is used for cooling and scrubbing purposes. The effluent from the process is treated by an onsite effluent treatment plant. Oil is separated from this water and the effluent is pH balanced, if required, to be suitable for discharge to sewer.

A thermal oxidiser will be used to destroy hydrocarbons produced during plant start up and shutdown, this unit is capable of consuming the entire hydrocarbon product being produced at the four pyrolysis chambers at any time as an emergency shutdown safeguard. The system has a series of pressure safety vents which are normally closed.

There are five point source emissions to air from the facility, one from each of the four syngas combustion chamber flues and one from the thermal oxidiser flue. Emission points from the combustion chambers will be continuousley monitored for carbon monoxide, particulate, total organic compounds, and oxides of nitrogen.

The material products produced by the process are stored in suitable, above ground, storage tanks. The material products are piped to a road tanker loading point for onward distribution.

The combustion of the syngas, produced within the process is derived from waste plastics. Consequently, the combustion of this syngas falls under the requirements of the Waste Incineration directive (WID) as a co-incinerator.

The status log of the permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	**Date**	**Comments**
Application EPR/HP3937FM/A001	Duly made 14/12/2011	Application for a liquefraction, pyrolysis and distillation of waste plastics to produce liquid fuels facility.
Additional information received	27/04/2012	Responses to Schedule 5 Notices issued on 20/02/2012 and on 30/03/2012
Additional information received	17/05/2012	Response to Schedule 5 Notice issued on 03/05/2012
Permit determined	26/07/2012	Permit issued to SITA UK Ltd.

End of introductory note

Permit

The Environmental Permitting (England and Wales) Regulations 2010

Permit number
EPR/HP3937FM

The Environment Agency hereby authorises, under regulation 13 of the Environmental Permitting (England and Wales) Regulations 2010

SITA UK Limited ("the operator"),

whose registered office is
SITA House
Grenfell Road
Maidenhead
Berkshire
SL6 1ES

company registration number 02291198

to operate an installation at
Avonmouth End of Life Plastics Facility
Bristol Resource Recovery Park
Merebank Road
Off - Kings Weston Lane
Avonmouth
Bristol
BS11 9FG

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

Name	Date
A.J. Nixon	26 July 2012

Authorised on behalf of the Environment Agency

Conditions

1 Management

1.1 General management

1.1.1 The operator shall manage and operate the activities:

(a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and

(b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.2 Energy efficiency

1.2.1 The operator shall:

(a) take appropriate measures to ensure that energy is recovered with a high level of energy efficiency and energy is used efficiently in the activities;

(b) review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and

(c) take any further appropriate measures identified by a review.

1.3 Efficient use of raw materials

1.3.1 The operator shall:

(a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;

(b) maintain records of raw materials and water used in the activities;

(c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and

(d) take any further appropriate measures identified by a review.

1.4 Avoidance, recovery and disposal of wastes produced by the activities

1.4.1 The operator shall take appropriate measures to ensure that:

(a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and

(b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and

(c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

1.4.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the “activities”).

2.1.2 Waste authorised by this permit in condition 2.3.3 shall be clearly distinguished from any other waste on the site.

2.2 The site

2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit.

2.3 Operating techniques

2.3.1 (a) The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.

(b) If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan specified in schedule 1, table S1.2 or otherwise required under this permit, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.

2.3.2 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.

2.3.3 Waste shall only be accepted if:

(a) it is of a type and quantity listed in schedule 2 table S2.2; and

(b) it conforms to the description in the documentation supplied by the producer and holder.

2.3.4 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:

(a) the nature of the process producing the waste;

(b) the composition of the waste;

(c) the handling requirements of the waste;

(d) the hazardous property associated with the waste, if applicable; and

(e) the waste code of the waste.

2.3.5 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.

2.3.6 Waste plastics shall not be charged, or shall cease to be charged, if:

(a) there is a malfunction of the syngas wet scrubber.

(b) the temperature measured at the outlet of the syngas combustion chamber is below or falls below 450^{o}C; or

(c) any continuous emission limit value in schedule 3 table S3.1 is exceeded other than under WID abnormal operating conditions; or

(d) monitoring results required to demonstrate compliance with any continuous emission limit value in schedule 3 table S3.1 are unavailable other than under WID abnormal operating conditions.

2.3.7 The Operator shall use natural gas at the furnace burner, to pre-heat the pyrolysis chamber at start up, or shut down, or whenever the operating temperature falls below that specified in condition 2.3.6 as long as incompletely pyrolysed waste is present in the pyrolysis chamber.

2.3.8 The Operator shall record the beginning and end of each period of "WID abnormal operation".

2.3.9 During a period of "WID abnormal operation", the operator shall restore normal operation of the failed equipment or replace the failed equipment as rapidly as possible.

2.3.10 Where, during "WID abnormal operation", any of the following situations arise, the operator shall, as soon as is practicable, cease the feed of waste plastic into the pyrolysis chamber until normal operation can be restored;

(a) continuous measurement shows that an emission exceeds any emission limit value in schedule 3 table S3.1 due to disturbances or failures of the abatement systems, or continuous emission monitors are out of service, as the case may be, for a total of 4 hours uninterrupted duration;

(b) the cumulative duration of "WID abnormal operation" periods, over a rolling 12 month period, exceeds 60 hours on a co-incineration line.

2.3.11 The Operator shall interpret the end of the period of "WID abnormal operation" as the earliest of the following:

(a) when the failed equipment is repaired and brought back into normal operation;

(b) when the Operator initiates a shut down of the waste pyrolysis activity, as described in the Application or as agreed in writing with the Environment Agency;

(c) when a period of 4 hours has elapsed from the start of the "WID abnormal operation";

(d) when, in any 12 month period, an aggregated period of 60 hours "WID abnormal operation" has been reached for a given incineration line.

2.3.12 During periods of start up, shutdown and emergency operation all emissions from the furnace must be diverted to the idling thermal oxidiser.

2.4 Improvement programme

2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Environment Agency.

2.4.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

2.5 Pre-operational conditions

2.5.1 The activities shall not be brought into operation until the measures specified in schedule 1 table S1.4 have been completed.

3 Emissions and monitoring

3.1 Emissions to water, air or land

3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in Schedule 3 tables S3.1, S3.2 and S3.3 except in "WID abnormal operation", when there shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1, S3.1(a), S3.2 and S3.3.

3.1.2 The limits given in schedule 3 shall not be exceeded.

3.1.3 Wastes produced at the installation (char from the pyrolysis chambers) shall, as a minimum, be sampled and analysed in accordance with the approved receiving facility. Additional samples shall be taken and tested and appropriate action taken, whenever;

(a) disposal or recovery routes change; or

(b) it is suspected that the nature or composition of the waste has changed such that the route currently selected may no longer be appropriate.

3.2 Emissions of substances not controlled by emission limits

3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.

3.2.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan;

(b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.2.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3 Monitoring

3.3.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:

(a) point source emissions specified in tables S3.1, S3.1(a), and S3.3;

(b) surface water or groundwater specified in table S3.2

(c) process monitoring specified in table S3.4

3.3.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements, calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.

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3.3.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.3.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), unless otherwise agreed in writing by the Environment Agency. Newly installed CEMs, or CEMs replacing existing CEMs, shall have MCERTS certification and have an MCERTS certified range which is not greater than 1.5 times the daily emission limit value (ELV) specified in schedule 3 table S3.1. The CEM shall also be able to measure instantaneous values over the ranges which are to be expected during all operating conditions. If it is necessary to use more than one range setting of the CEM to achieve this requirement, the CEM shall be verified for monitoring supplementary, higher ranges.

3.3.4 Permanent means of access shall be provided to enable sampling / monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1, S3.1(a), S3.2 and S3.3 unless otherwise agreed in writing by the Environment Agency.

3.3.5 Where Continuous Emission Monitors are installed to comply with the monitoring requirements in schedule 3 table S3.1; the Continuous Emission Monitors shall be used such that;

(a) the values of the 95% confidence intervals of a single measured result at the daily emission limit value shall not exceed the following percentages:

- Carbon monoxide 10%
- Sulphur dioxide 20%
- Oxides of nitrogen (NO & NO_2 expressed as NO_2) 20%
- Particulate matter 30%
- Total organic carbon (TOC) 30%
- Hydrogen chloride 40%

(b) valid half-hour average values shall be determined within the effective operating time (excluding the start-up and shutdown periods) from the measured values after having subtracted the value of the confidence intervals in condition 3.3.5(a);

(c) where it is necessary to calibrate or maintain the monitor and this means that data is not available for a complete half-hour period, the half-hourly average shall in any case be considered valid if measurements are available for a minimum of 20 minutes during the half-hour period. The number of half-hourly averages so validated shall not exceed 5 per day;

(d) daily average values shall be determined as the average of all the valid half-hourly average values within a calendar day. The daily average value shall be considered valid if no more than 5 half-houly average values in any day have been determined not to be valid

(e) no more than 10 daily average values per year shall be determined not to be valid.

3.4 Odour

3.4.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.

3.4.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan;

(b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.5 Noise and vibration

3.5.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.5.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan;

(b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

4 Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

(a) be legible;

(b) be made as soon as reasonably practicable;

(c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and

(d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:

(i) off-site environmental effects; and

(ii) matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.

4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) each year. The report(s) shall include as a minimum:

(a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;

(b) the annual production / treatment data set out in schedule 4 table S4.2; and

(c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule.

(d) the functioning and monitoring of the plant in a format agreed with the Environment Agency. The report shall, as a minimum requirement (as required by Article 12(2) of the WID) give an account of the running of the process and the emissions into air and water compared with the emission standards in the WID.

4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

(a) in respect of the parameters and emission points specified in schedule 4 table S4.1;

(b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.4 ; and

(c) giving the information from such results and assessments as may be required by the forms specified in those tables.

4.2.4 The operator shall, unless notice under this condition has been served within the preceding four years, submit to the Environment Agency, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

4.2.5 Within 1 month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter.

4.3 Notifications

4.3.1 The Environment Agency shall be notified without delay following the detection of:

(a) any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution;

(b) the breach of a limit specified in the permit; or

(c) any significant adverse environmental effects.

4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

(a) any change in the operator's trading name, registered name or registered office address; and

(b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

(a) in change in the operator's name or address; and

(b) any steps taken with a view to the dissolution of the operator.

4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

(a) the Environment Agency shall be notified at least 14 days before making the change; and

(b) the notification shall contain a description of the proposed change in operation.

4.3.6 The Environment Agency shall be given at least 14 days notice before implementation of any part of the site closure plan.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made “without delay”, in which case it may be provided by telephone.

Schedule 1 - Operations

Table S1.1 activities		
Activity listed in Schedule 1 of the EP Regulations	**Description of specified activity**	**Limits of specified activity**
S1.2 A1 (j) (iv)	The pyrolysis, carbonisation, distillation, liquefaction, gasification, partial oxidation or other heat treatment of other carbonaceous material.	From receipt of waste plastics and other raw materials to final production of material products.
Directly Associated Activity		
Product storage	Storage of material products	Includes light oil, kerosene and diesel receipt from process and storage

Table S1.2 Operating techniques		
Description	**Parts**	**Date Received**
Application	Non-technical summary, Sections 1.4, 1.5, 2.1, 2.2, 2.5, 2.6, 2.7 and 2.8 of the application document in response to section 5a – technical standards , Part B of the application form	14/12/2011
Response to Schedule 5 Notice dated 20/02/2012	Response to question 5 detailing process control and point sourse emission points.	27/04/2012
Response to Schedule 5 Notice dated 30/03/2012	Response to questions 1 & 4 detailing compliance with the requirements of the WID and question 5 detailing the emission monitoring and reporting regime.	27/04/2012
Response to Schedule 5 Notice dated 03/05/2012	Response to question 3 detailing process combustion of syngas inline with the requirements of the WID.	17/05/2012

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IC1	The Operator shall submit a written report to the Environment Agency on the implementation of its Environmental Management System and the progress made in the accreditation of the system by an external body or if appropriate submit a schedule by which the EMS will be subject to accreditation.	Within 12 months of the date on which waste plastics are first processed.
IC2	The Operator shall submit a written report to the Environment Agency on the commissioning of the installation. The report shall summarise the environmental performance of the plant as installed against the design parameters set out in the Application. The report shall also include a review of the performance of the facility against the conditions of this permit and details of procedures developed during commissioning for achieving and demonstrating compliance with permit conditions.	Within 4 months of the completion of commissioning

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IC3	The Operator shall submit a written summary report to the Agency to confirm by the results of calibration and verification testing that the performance of Continuous Emission Monitors for parameters as specified in Table S3.1 complies with the requirements of BS EN 14181, specifically the requirements of QAL1, QAL2 and QAL3.	Initial calibration report to be submitted to the Agency within 3 months of completion of commissioning. Full summary evidence compliance report to be submitted within 18 months of commissioning

Table S1.4 Pre-operational measures	
Reference	**Pre-operational measures**
PO1	Prior to the commencement of commissioning, the Operator shall send a summary of the site Environment Management System (EMS) to the Environment Agency and make available for inspection all documents and procedures which form part of the EMS. The EMS shall be developed in line with the requirements set out in Section 1 of How to comply with your environmental permit – Getting the basics right. The documents and procedures set out in the EMS shall form the written management system referenced in condition 1.1.1 (a) of the permit.
PO2	Prior to the commencement of commissioning; the Operator shall provide a written commissioning plan, including timelines for completion, for approval by the Environment Agency. The commissioning plan shall include the expected emissions to the environment during the different stages of commissioning, the expected durations of commissioning activities and the actions to be taken to protect the environment and report to the Environment Agency in the event that actual emissions exceed expected emissions. Commissioning shall be carried out in accordance with the commissioning plan as approved.
PO3	Prior to the commencement of commissioning, the Operator shall submit a written report to the Environment Agency detailing the waste acceptance procedure to be used at the site. The waste acceptance procedure shall include the process and systems by which wastes unsuitable for processing at the site and wastes that can be more beneficially recycled will be controlled. The procedure shall be implemented in accordance with the written approval from the Environment Agency.

Schedule 2 - Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels	
Raw materials and fuel description	**Specification**
Natural gas	

Table S2.2 Permitted waste types and quantities for liquefaction, pyrolysis and distillation facility	
Maximum quantity	6,000 tonnes per annum.
Waste code	**Description**
02	**WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARA-TION/ PROCESSING**
02 01	**wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing**
02 01 04	waste plastics (except packaging)
07	**WASTES FROM ORGANIC CHEMICAL PROCESSES**
07 02	**wastes from the MFSU of plastics, synthetic rubber and man-made fibres**
07 02 13	waste plastic
12	**WASTES FROM SHAPING AND PHYSICAL AND MECHANICAL SURFACE TREATMENT OF METALS AND PLASTICS**
12 01	**wastes from shaping and physical and mechanical surface treatment of metals and plastics**
12 01 05	plastics shavings and turnings
15	**WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FIL-TER MATERIALS AND PROTECTIVE CLOTHING NOT OTHER-WISE SPECIFIED**
15 01	**packaging (including separately collected municipal packaging waste)**
15 01 02	plastic packaging
16	WASTES NOT OTHERWISE SPECIFIED IN THE LIST
16 01	**end-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance (except 13, 14, 16 06 and 16 08)**
16 01 19	plastic
17	**CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)**
17 02	wood, glass and plastic
17 02 03	plastic
19	**WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARA-TION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE**
19 12	**wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified**
19 12 04	plastic and rubber
20	**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 39	plastics

Schedule 3 – Emissions and monitoring

Table S3.1 Point source emissions to air – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	Furnace syngas burner	300 mg/m^3	Daily average	Continuous measurement	BS EN 14181
			600 mg/m^3	Half Hourly average		
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Carbon monoxide	Furnace syngas burner	75 mg/m^3	Daily average	Continuous measurement	BS EN 14181
			150 mg/m^3	Half Hourly average		
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Particulates (PM_{10})	Furnace syngas burner	15 mg/m^3	Daily average	Continuous measurement	BS EN 14181
			45 mg/m^3	Half Hourly average		
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Total organic carbon (TOC)	Furnace syngas burner	15 mg/m^3	Daily average	Continuous measurement	BS EN 14181
			30 mg/m^3	Half Hourly average		
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Sulphur dioxide	Furnace syngas burner	75 mg/m^3	Periodic over minimum 1-hour period	Quarterly in first year. Then Bi-annual	BS EN 14791
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Hydrogen Chloride	Furnace syngas burner	15 mg/m^3	Periodic over minimum 1-hour period	Quarterly in first year. Then Bi-annual	BS EN 1911 Parts 1, 2 and 3
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Hydrogen fluoride	Furnace syngas burner	2.0 mg/m^3	Periodic over minimum 1-hour period	Quarterly in first year. Then Bi-annual	BS ISO 15713
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Cadmium & thallium and their compounds (total)	Furnace syngas burner	0.05 mg/m^3	Periodic over minimum 30 minute, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 14385

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	**Parameter**	**Source**	**Limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Mercury and its compounds	Furnace syngas burner	0.05 mg/m^3	Periodic over minimum 30 minute, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 13211
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	Furnace syngas burner	0.5 mg/m^3	Periodic over minimum 30 minute, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 14385
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Dioxins / furans (I-TEQ)	Furnace syngas burner	0.1 ng/m^3	Periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 1948 Parts 1, 2 and 3
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Dioxins / furans (WHO-TEQ Humans / Mammals)	Furnace syngas burner		Periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 1948 Parts 1, 2 and 3
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Dioxins / furans (WHO-TEQ Fish)	Furnace syngas burner		Periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 1948 Parts 1, 2 and 3
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Dioxins / furans (WHO-TEQ Birds)	Furnace syngas burner		Periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 1948 Parts 1, 2 and 3
Dioxin-like PCBs (WHO-TEQ Humans / Mammals)		Furnace syngas burner		periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 1948-4

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	**Parameter**	**Source**	**Limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
Dioxin-like PCBs (WHO-TEQ Fish)		Furnace syngas burner		periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 1948-4
Dioxin-like PCBs (WHO-TEQ Birds)		Furnace syngas burner		periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 1948-4
Specific individual poly-cyclic aromatic hydrocarbons (PAHs), as specified in Schedule 6.		Furnace syngas burner		periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year. Then Bi-annual	Procedure shall use BS ISO 11338-1 and BS-ISO 11338-2.
Thermal Oxidiser stack [Point A5 on site plan in Schedule 7]	No Parameters set	Exhaust from thermal oxidiser	No limits set	-	-	

Table S3.1(a) Point source emissions to air during abnormal operation of co-incineration plant - emssion limits and monitoring requirements						
Emission point ref. & location	**Parameter**	**Source**	**Limit (including unit)**	**Reference Period**	**Monitoring frequency**	**Monitoring standard or method**
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Total organic carbon (TOC)	Furnace syngas burner	30 mg/m^3	half hour average	Continuous measurement	BS EN 14181
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Carbon monoxide	Furnace syngas burner	150 mg/m^3	half hour average	Continuous measurement	BS EN 14181

Table S3.2 Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (incl. unit)	Reference Period	Monitoring frequency	Monitoring standard or method
W1 (soakaway to ground)	No parameters set	Surface water	No limit set			

Table S3.3 Point source emissions to sewer, effluent treatment plant or other transfers off-site– emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (incl. Unit)	Reference period	Monitoring frequency	Monitoring standard or method
S1 (as located on site plan in Schedule7)	No parameters set	Scrubber effluent water and process water collection sump. Oily water treatment separator units.	No limit set.			

Table S3.4 Process monitoring requirements

Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
Furnace chambers, 1,2,3 and 4, location close to the combustion chamber exit inner wall .	Temperature	Continuous	Traceable to national standards	As agreed in writing with the Agency.
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Exhaust gas temperature	Continuous	Traceable to national standards	As agreed in writing with the Agency.
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Exhaust gas pressure	Continuous	Traceable to national standards	As agreed in writing with the Agency.
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Exhaust gas oxygen content	Continuous	BS EN 15267-3 BS EN 14181	
Furnace stacks 1,2,3 and 4. [Point A1,A2,A3 and A4 on site plan in Schedule 7]	Exhaust gas water vapour content	Continuous	BS EN 14181	

Schedule 4 - Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data

Parameter	Emission or monitoring point/reference	Reporting period	Period begins
Emissions to air Parameters as required by condition 3.3.1.	A1, A2, A3, and A4.	Every 6 months	1 January, 1 July
Functioning and monitoring of the thermal treatment plant as required by condition 4.2.2		Annually	1 January

Table S4.2: Annual production / treatment

Parameter	Units
Total plastic waste thermally treated	tonnes
Diesel product produced	litres
Kerosene product produced	litres
Light oil product produced	litres
Electrical energy used on installation	kWh
Natural gas used at the installation	kWh

Table S4.3 Performance parameters

Parameter	Frequency of assessment	Units
Water usage	Annually	m^3 / tonne of waste plastics treated
Electrical energy usage	Annually	KWh / tonne of waste plastics treated
Total raw materials used	Annually	tonnes
Mass of solid residues produced	Annually	tonnes

Table S4.4 Reporting forms

Media/parameter	Reporting format	Date of form
Air	Forms air 1,2,3,4,5 & 6 or other forms as agreed in writing by the Environment Agency	28/06/2012
Water usage	Form water usage 1 or other form as agreed in writing by the Environment Agency	28/06/2012
Energy usage	Form energy 1 or other form as agreed in writing by the Environment Agency	28/06/2012

Schedule 5 - Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	**EPR/HP3937FM**
Name of operator	**SITA UK Limited**
Location of Facility	**Avonmouth ELP Facility**
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B - to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of SITA UK Ltd.

Schedule 6 - Interpretation

"abatement equipment" means that equipment dedicated to the removal of polluting substances from releases from the installation to air or water media.

"accident" means an accident that may result in pollution.

"application" means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

"authorised officer" means any person authorised by the Environment Agency 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(4) of that Act.

"bi-annual" means twice per year with at least five months between tests;

"CEM" Continuous emission monitor

"Char" means solid residue from the pyrolysis chamber

"daily average" for releases of substances to air means the average of valid half-hourly averages over consecutive discrete periods of 24 hours as described in the application during normal operation.

"*dioxin and furans*" means polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans.

"disposal" means any of the operations provided for in Annex IIA to Directive 2008/98/EC of the Waste Framework Directive.

"EP Regulations" means The Environmental Permitting (England and Wales) Regulations SI 2010 No.675 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

"emissions of substances not controlled by emission limits" means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission limit..

"groundwater" means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

"incineration line" means all of the incineration equipment related to a common discharge to air location.

"ISO" means International Standards Organisation.

"MCERTS" means the Environment Agency's Monitoring Certification Scheme.

"PAH" means Poly-cyclic aromatic hydrocarbon, and comprises Anthanthrene, Benzo[a]anthracene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[b]naph(2,1-d)thiophene, Benzo[c]phenanthrene, Benzo[ghi]perylene, Benzo[a]pyrene, Cholanthrene, Chrysene, Cyclopenta[c,d]pyrene, Dibenzo[ah]anthracene, Dibenzo[a,i]pyrene Fluoranthene, Indo[1,2,3-cd]pyrene, Naphthalene

"PCB" means *Polychlorinated Biphenyl. Dioxin-like PCBs are the non-ortho and mono-ortho PCBs listed in the table below.*

"quarter" means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

"quarterly" for reporting/sampling means after/during each 3 month period, January to March; April to June; July to September and October to December and, when sampling, with at least 2 months between each sampling date.

"recovery" means any of the operations provided for in Annex IIB to Directive 2008/98/EC of the Waste Framework Directive.

"*shut down"* is any period where the plant is being returned to a non-operational state and there is no waste being consumed.

"start up" is any period, where the plant has been non-operational, after igniting the dual fuel burner using natural gas until waste has been fed to the pyrolysis chamber to initiate steady-state conditions at operational temperature and production of syngas commences, as described in the application.

"TOC" means *Total Organic Carbon.* In respect of releases to air, this means the gaseous and vaporous organic substances, expressed as TOC.

"Waste code" means the six digit code referable to a type of waste in accordance with the List of Wastes (England) Regulations 2005, and in relation to hazardous waste, includes the asterisk.

"Waste Incineration Directive" means Directive 2000/76/EC on the incineration of waste (O.J. L 332, 28.12.2000)

"WFD" means Waste Framework Directive (Directive 2008/98/EC of the European Parliament and Council).

"WID abnormal operation" means any technically unavoidable stoppages, disturbances, or failures of the abatement plant or the measurement devices during which the concentrations in the discharges into air and the purified waste water of the regulated substances may exceed the normal emission limit values.

"year" means calendar year ending 31 December.

Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

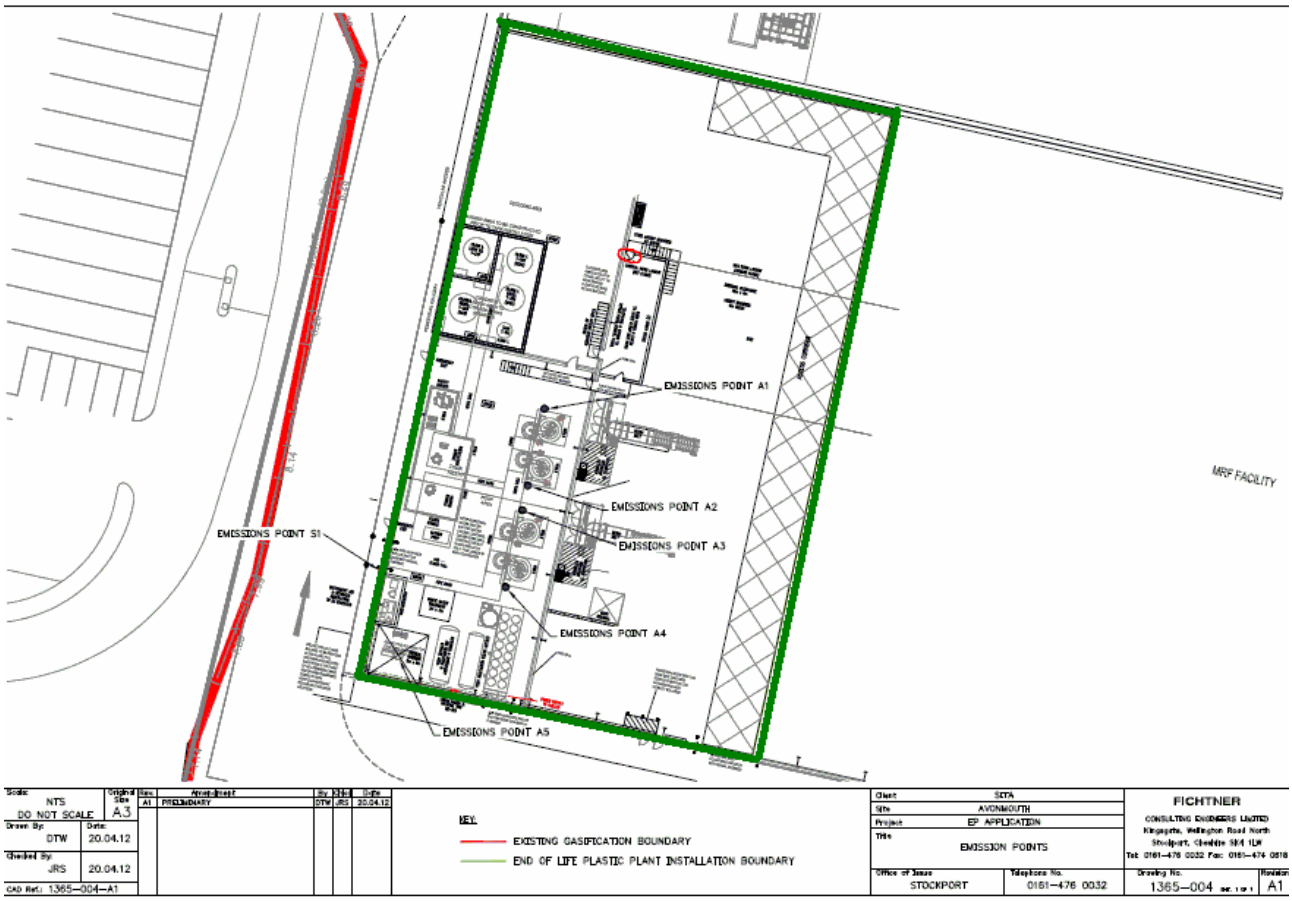
Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means: in relation to gases from incineration and co-incineration plants other than those burning waste oil, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 6% dry.

For dioxins/furans and dioxin-like PCBs the determination of the toxic equivalence concentration (I-TEQ, & WHO-TEQ for dioxins/furans, WHO-TEQ for dioxin-like PCBs) stated as a release limit and/ or reporting requirement, the mass concentrations of the following congeners have to be multiplied with their respective toxic equivalence factors before summing. When reporting on measurements of dioxins/furans and dioxin-like PCBs, the toxic equivalence concentrations should be reported as a range based on: all congeners less than the detection limit assumed to be zero as a minimum, and all congeners less than the detection limit assumed to be at the detection limit as a maximum.

TEF schemes for dioxins and furans				
Congener	***I-TEF***	***WHO-TEF***		
	1990	**2005**	**1997/8**	
		Humans / Mammals	***Fish***	***Birds***
Dioxins				
2,3,7,8-TCDD	*1*	*1*	*1*	*1*
1,2,3,7,8-PeCDD	*0.5*	*1*	*1*	*1*
1,2,3,4,7,8-HxCDD	*0.1*	*0.1*	*0.5*	*0.05*
1,2,3,6,7,8-HxCDD	*0.1*	*0.1*	*0.01*	*0.01*
1,2,3,7,8,9-HxCDD	*0.1*	*0.1*	*0.01*	*0.1*
1,2,3,4,6,7,8-HpCDD	*0.01*	*0.01*	*0.001*	*<0.001*
OCDD	*0.001*	*0.0003*	*-*	*-*
Furans				
2,3,7,8-TCDF	*0.1*	*0.1*	*0.05*	*1*
1,2,3,7,8-PeCDF	*0.05*	*0.03*	*0.05*	*0.1*
2,3,4,7,8-PeCDF	*0.5*	*0.3*	*0.5*	*1*
1,2,3,4,7,8-HxCDF	*0.1*	*0.1*	*0.1*	*0.1*
1,2,3,7,8,9-HxCDF	*0.1*	*0.1*	*0.1*	*0.1*
1,2,3,6,7,8-HxCDF	*0.1*	*0.1*	*0.1*	*0.1*
2,3,4,6,7,8-HxCDF	*0.1*	*0.1*	*0.1*	*0.1*
1,2,3,4,6,7,8_HpCDF	*0.01*	*0.01*	*0.01*	*0.01*
1,2,3,4,7,8,9-HpCDF	*0.01*	*0.01*	*0.01*	*0.01*
OCDF	*0.001*	*0.0003*	*0.0001*	*0.0001*

TEF schemes for dioxin-like PCBs			
Congener	***WHO-TEF***		
	2005	**1997/8**	
	Humans / mammals	***Fish***	***Birds***
Non-ortho PCBs			
3,4,4',5-TCB (81)	*0.0001*	*0.0005*	*0.1*
3,3',4,4'-TCB (77)	*0.0003*	*0.0001*	*0.05*
3,3',4,4',5 - PeCB (126)	*0.1*	*0.005*	*0.1*
3,3',4,4',5,5'-HxCB(169)	*0.03*	*0.00005*	*0.001*
Mono-ortho PCBs			
2,3,3',4,4'-PeCB (105)	*0.00003*	*<0.000005*	*0.0001*
2,3,4,4',5-PeCB (114)	*0.00003*	*<0.000005*	*0.0001*
2,3',4,4',5-PeCB (118)	*0.00003*	*<0.000005*	*0.00001*
2',3,4,4',5-PeCB (123)	*0.00003*	*<0.000005*	*0.00001*
2,3,3',4,4',5-HxCB (156)	*0.00003*	*<0.000005*	*0.0001*
2,3,3',4,4',5'-HxCB (157)	*0.00003*	*<0.000005*	*0.0001*
2,3',4,4',5,5'-HxCB (167)	*0.00003*	*<0.000005*	*0.00001*
2,3,3',4,4',5,5'-HpCB (189)	*0.00003*	*<0.000005*	*0.00001*

Schedule 7 - Site plan



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