

# Permitting decisions

## Bespoke permit

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We have decided to grant the permit for Imperial College London SK CHP operated by Imperial College of Science, Technology and Medicine.

The permit number is EPR/BP3832YU.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

### Purpose of this document

This decision document provides a record of the decision making process. It:

- highlights key issues in the determination
- summarises the decision making process in the decision checklist to show how all relevant factors have been taken into account
- shows how we have considered the consultation responses.

Unless the decision document specifies otherwise, we have accepted the applicant's proposals.

Read the permitting decisions in conjunction with the environmental permit. The introductory note summarises what the permit covers.

# Key issues of the decision

## **1) Chapter II Combustion Plant**

Interlocks were historically used to keep this plant's capacity below the 50 MWth Threshold criteria. The interlocks were removed for various beneficial plant control reasons in 2017 and now the plant exceeds the 50 MWth criteria and therefore is permitted as a Section 1.1 A(1)(a) activity under the Environmental Permitting Regulations (EPR) 2016.

Chapter III of the Industrial Emissions Directive (IED) covers the requirements of the previous Large Combustion Plant Directive. The Energy Centre combustion units are not subject to Chapter III as no single unit size is >15 MW thermal input. The activity is therefore regulated under Chapter II of the IED.

The Medium Combustion Plant Directive (MCPD) applies to new medium combustion plants where the total rated thermal input is equal to or greater than 50 MW, unless covered by Chapter III. For medium combustion plants which are part of an installation covered by Chapter II of Directive 2010/75/EU, the requirements of Article 5 of the MCPD shall be deemed to be fulfilled through compliance with that Directive. In line with Article 6 of the MCPD, this site is a medium combustion plant regulated under Chapter II, the relevant MCPD emissions limits will apply (see section 5.1).

## **2) Best Available Techniques (BAT) assessment**

### **2.1) Combustion technology**

The gas engines and gas boilers are part of an existing operation of which the design, installation and commissioning predate discussions with the Environment Agency regarding requirement for the site to have an environmental permit. The selection of technology was therefore not necessarily based on the premise of it complying with the regulatory guidance and BAT.

The Applicant (now the Operator) has therefore carried out a review of the combustion technologies on site and made an assessment of the technology in order to determine whether their technology can be considered in line with BAT. Based on the results of this assessment, the Operator demonstrated the existing gas engines and gas boilers are BAT for the following reasons.

Gas engines:

- The gas engines meet the emissions limit values for new plant even though it could be considered 'existing plant' under MCP.
- The engines use lean burn and have low NO<sub>x</sub> burners.
- The engines support a district heating to maximise efficiency. Water used to cool the gas engines is used to pre-heat the district heating network water.
- The engines (energy and heat) provide 65% energy efficiency.
- The flue gas is used to heat two out of three of the boilers.
- Selective Catalytic Reduction (SCR) will continue to be reviewed as an option for NO<sub>x</sub> abatement going forward. The implementation of this option is to be reviewed in line with the permit improvement conditions (see section 5.2).

The gas boilers:

- The boilers utilise a boiler burner management system.
- Condensate is returned to the Energy Centre which increases the energy efficiency of the system and reduces the amount of natural gas used.
- The secondary purpose of the boilers to provide additional heat to the campus district heating network.

## **2.2) Choice of Fuel**

For the gas engines and boilers, the Operator chose natural gas delivered directly from the National Grid as the optimum fuel for this installation. Using natural gas significantly minimises the risk of impact from SO<sub>x</sub> and PM<sub>10</sub> as emissions from the combustion of this fuel are low. Use of this fuel also addresses a lack of available space for storing large volumes of hydrocarbon fossil fuel and the significant associated environmental impact in the event of spillage or loss. Natural gas has therefore been selected as BAT in terms of fuel choice for this Installation.

## **2.3) Bypass valve/exhaust**

The Applicant has confirmed that the CHP bypass valve has been physically inhibited with a spade piece, thus system load follows on heat and power and they utilise 100% of high grade heat. We have therefore not requested reporting for use of the bypass valve.

## **3) Assessment of Impact on Air Quality**

Emissions to air arising from combustion of natural gas in the gas boilers and gas engines constitute the main environmental impact of the Imperial College London Energy Centre. An air quality impact assessment has been carried out to predict the impacts associated with operation of the Energy Centre boilers, gas engines, SAF building and Flowers building standby boilers and emergency generators.

The Applicant submitted an Air Quality Impact Assessment and a study of the impact of emissions on nearby habitat/conservation sites. Hourly sequential meteorological data from Heathrow Airport and London City Airport over the years 2012 to 2016 was used in the model. The Heathrow meteorological station lies approximately 16 km to the south west and the London City meteorological station approximately 15 km to the east of the site. These locations are considered the most representative meteorological stations for the assessment. The impact of the terrain surrounding the site and buildings upon plume dispersion was considered in the dispersion modelling.

As well as calculating the peak ground level concentration, the Applicant has modelled the concentration of key pollutants at a number of specified locations within the surrounding area. The modelling has considered the plant operating at full load and the most likely operation mode.

The air quality impact assessment concluded that:

- concentrations of CO were found to be insignificant at human receptors with the PC less than 1% of the (Environmental Standard (ES), even under full load;
- concentrations of NO<sub>2</sub> were found to be not significant with respect to short-term NO<sub>2</sub> concentrations with the PC + short term background concentration being less than the ES (59%);
- concentrations of NO<sub>2</sub> were found to be potentially significant with respect to long-term NO<sub>2</sub> concentrations.

## **3.1 Human Receptors**

The Applicant's modelling predictions are presented in Table 1 below. The figures shown indicate the predicted peak ground level exposure to pollutants in ambient air. We have made our own verification of the percentage process contribution and predicted environmental concentrations submitted by the Applicant. These may be slightly different to those shown in the Application. Any such minor discrepancies do not materially impact on our conclusions.

**Table 1 – Maximum modelled nitrogen dioxide concentrations at the receptor with the highest process contribution (receptor ID “10\_1.5m” Business School grid ref 526804 179421)**

Pollutant	ES µg/m <sup>3</sup>	Back-ground µg/m <sup>3</sup>	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
			µg/m <sup>3</sup>	% of ES	µg/m <sup>3</sup>	% of ES
NO <sub>2</sub> (annual)	40	41.7	7.0	17.5	48.7	121.8
NO <sub>2</sub> (1 hour)	200	83.4	34.9	17.4	118.3	59.2
CO (8 hourly mean)	10,000	546.5	89.7	0.9	636.3	6.4

From the table above, carbon monoxide emissions from the Energy centre can be screened out as insignificant in that the PC is <1% of the long term ES.

Short term Nitrogen dioxide can be screened out as not significant in that the PEC is less than the ES.

Long term nitrogen dioxide emissions cannot be screened out, therefore further assessment was required, please refer to section 3.3 below covering further assessment.

### **3.2 Ecological receptors**

At ecological receptors the impact of NO<sub>x</sub>, nutrient nitrogen deposition and acid deposition at the special areas of conservation (SAC) was found to be insignificant (see Table 2 below). The nitrogen oxide emissions at the worst case local wildlife site (LWS) did not screen out as insignificant, we have addressed this in section 3.2.3 below.

We have made our own verification of the percentage process contribution/deposition and predicted environmental concentration submitted by the Applicant. These may be very slightly different to those shown in the Application. Any such minor discrepancies do not materially impact on our conclusions.

**Table 2 – Maximum modelled NO<sub>x</sub> concentrations at conservation sites**

Pollutant	Critical Level (CLe)	Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)[1]	
			µg/m <sup>3</sup>	% of CLe	µg/m <sup>3</sup>	% of CLe
Richmond Park SAC						
NO <sub>x</sub> (annual)	30	45.8	0.03	0.1	-	-
NO <sub>x</sub> (daily)	75	91.5	0.64	0.9	-	-
Wimbledon Common SAC						
NO <sub>x</sub> (annual)	30	58.0	0.03	0.1	-	-
NO <sub>x</sub> (daily)	75	115.9	0.75	1.0	-	-
Prince's Gate East, Princes Gate West and Rutland Gate North (LWS) [2]						
NO <sub>x</sub> (annual)	30	-	4.50	15%	-	-
NO <sub>x</sub> (daily)	75	-	13.53	18%	-	-
<i>Note [1]: Where the PC is less than 1% of the benchmark for a long term measurement or less than 10% for a short term measurement, the impact is considered to be insignificant. In these cases, examination of the PEC is not required.</i>						

*Note [2]: LWS represents site with highest process contributions*

From the table above, nitrogen oxide at the special areas of conservation (SAC) can be screened out as insignificant in that the process contribution is <1% of the long term and <10% of the short term. We have checked the modelling data and our results are consistent with the Applicant's assessment. The nitrogen oxide emissions at the local wildlife site (LWS) did not screen out as insignificant, we have addressed this in section 3.2.3 below.

### 3.2.1 Nutrient nitrogen enrichment

The background concentrations for nutrient nitrogen at the Richmond Park and Wimbledon Common SAC sites were obtained from the Air Pollution Information System (APIS) website. Table 3 below shows the predicted nutrient nitrogen deposition rates at these two sites.

**Table 3 – Maximum modelled nutrient nitrogen deposition at the Richmond Park and Wimbledon Common SAC sites based on the lowest value for sensitive features**

Habitat Site	Critical Load (CLo) kgN/ha/yr	Background N deposition kgN/ha/yr	PC N deposition kgN/ha/yr	PC as % of minimum threshold level	Significant
Richmond Park (SAC)	10-20 Broadleaved deciduous woodland (Lucanus cervus - Stag beetle)	26.4	<0.01	0.03	No
Wimbledon Common (SAC)	10-20 Broadleaved deciduous woodland (Lucanus cervus - Stag beetle)	27.2	<0.01	0.03	No

From the table above, nitrogen deposition can be screened out as insignificant in that the process contribution is <1% of the critical load at the Richmond Park and Wimbledon Common SAC sites. The Environment Agency conducted check modelling of the air quality assessment and the results were consistent with those of the Applicant.

### 3.2.2 Acid deposition

The acid deposition rates were obtained from APIS website to obtain the species-based critical load function for the Richmond Park and Wimbledon Common SAC sites. The results are presented in Table 4 below.

**Table 4 – Maximum modelled acid deposition rates at the Richmond Park and Wimbledon Common SAC sites.**

Habitat Site	Most sensitive habitat	CL Nmin	CL Nmax	CLS max	Background deposition keq/ha/yr	PC % of Critical Load Function	Significant
Richmond Park (SAC)	Unmanaged broadleaved /coniferous woodland (Lucanus cervus – Stag beetle)	0.142-0.357	1.880-2.754	0.724-1.718	Max N - 1.94	<0.1	No
					Max S - 0.2		
Wimbledon Common (SAC)	Dwarf shrub heath (North Atlantic wet heaths with Erica tetralix)	0.642-0.714	0.872-1.594	0.230-0.880	Max N – 1.14	<0.1	No
					Max S – 0.16		

From the table above, acid deposition can be screened out as insignificant in that the process contribution is <1% of the critical load function. We have checked the modelling data and our results are consistent with the Applicant's assessment.

### 3.2.3 Assessment of non-statutory sites

From table 2 above, nitrogen oxide can be screened out as not significant in that the PC long term and short term are less than 100% of the environmental standard. We have checked the modelling data and our results are consistent with the Applicant's assessment.

The Applicant's assessment of non-statutory sites was reviewed by the Environment Agency and we agree with their conclusions, that the proposal will not damage the special features of the non-statutory sites. As there are no specific regulations for the protection of these sites (*beyond our requirements to enhance biodiversity under the Natural Environment and Rural Communities Act 2006 and our wider conservation duties under the Environment Act*), we are required to ensure that the permitting of the Installation will not result in significant pollution.

Our audit of the Applicant's air dispersion modelling also identified that the Applicant's predictions could be significantly overestimated (see section 3.3). Due to the site being operational, we have taken a pragmatic approach to managing the performance of this site, inserting improvement conditions into the permit which require the Applicant to undertake an extensive review of the emissions from their Energy Centre (see section 5). This includes revised emissions modelling and a review of their emissions control techniques. In addition we have implemented strict emissions limits beyond that expected for existing plant. We have outlined our approach in section 5 of this document. This approach will include a review of the nutrient and acid deposition at local wildlife sites as they were not included in the initial air modelling.

The Environment Agency is satisfied that the operation of the facility is unlikely to have a significant effect on any of the sites identified in this assessment either alone or in-combination with other plans and projects. We are also satisfied that conditions are in place to allow us to work with the operator to continue to review their emissions and ensure BAT is in place.

### **3.3 Air modelling audit conclusion**

We have assessed the Applicant's modelling and except for annual NO<sub>2</sub>, Predicted Environmental Concentrations (PEC) are likely to remain below the ES.

Annual NO<sub>2</sub> is projected to be potentially significant with respect to the ES at human receptors. Our audit of the Applicant's air dispersion modelling however identified that the Applicant's predictions could be significantly overestimated due to:

- NO<sub>x</sub> to NO<sub>2</sub> conversions - the Applicant assumed NO<sub>x</sub> to NO<sub>2</sub> conversions of 100% for long-term (LT) and 50% for short-term (ST) used for screening purposes, leading to highly conservative NO<sub>2</sub> PCs.
- Hourly factors for the likely operation - the Applicant modelled the majority of these operational hours emitting at approximately 2 and 3 times higher than the modelled emission rate.
- Source parameters and emission rates - emissions were modelled at measured concentrations that are lower than the ELV of 95 mg/Nm<sup>3</sup> (\*) with volume flows that might not correspond to the measured concentration. We also noted that their NO<sub>x</sub> emissions at the ELV are proportionally much higher to what we would expect for the engine thermal capacities.
- The site has applied for a retrospective permit application. Therefore the background air quality measured would have included the plant's historical operation. Therefore the process contributions included in the predicted environment concentration are on top of existing operations and therefore emissions will have been double counted.

Taking these significant over estimations into account, we are not satisfied that the Applicant's modelling can be used to determine whether long term NO<sub>2</sub> emissions will impact significantly on local air quality. We are however of the opinion that emissions are likely to be significantly lower than projected and therefore will screen out as not significant. Considering these over estimations, we are also not confident that the Applicant's conclusions can be utilised to set appropriate emissions limits. We describe how we have addressed this issue in section 5 below.

## **4) Abatement systems**

### **4.1) Primary Emissions Abatement**

The Applicant has demonstrated that sufficient primary emission controls will be in place. These include the configuration of engine internals, such as cylinders, pistons and cylinder heads, as well as the tuning of engines to achieve Enhanced Lean Burn and use of low NO<sub>x</sub> burners to maximise combustion efficiency and minimise the production of NO<sub>x</sub>. We are satisfied these measures are in line with best practice.

## **5) Permitting approach**

The Imperial College London Energy Centre is currently operating and supplies heat and power to their Kensington campus. The site's combustion plan is not fitted with a secondary abatement system, however the plant is fitted with primary abatement and the CHP engines are designed to achieve emissions limits in line with that required for a new medium combustion plant.

Our review of the Applicant's air dispersion modelling (which predicts the potential for a breach in environmental standards) has led us to consider the Applicant's modelling approach to be significantly overly conservative due to NO<sub>x</sub> to NO<sub>2</sub> conversions, modelling emissions rate factoring, volume flows against modelled concentration and NO<sub>x</sub> emissions are proportionally much higher to what we would expect for the engine thermal capacities (see section 3.3). It is therefore likely emissions are significantly lower than those predicted and as a result the modelling cannot be used to determine whether emissions are significant.

The Applicant has undertaken subsequent monitoring of the CHP plant and boilers to establish the actual plant emissions.

- The CHP plant is able to achieve a maximum of 245 mg/m<sup>3</sup> NO<sub>x</sub> (at 5% Oxygen)
- The boiler plant is able to achieve maximum of 170 mg/m<sup>3</sup> NO<sub>x</sub> (at 3% Oxygen)

Though these results do not necessarily correspond with the air quality modelling emission inputs, the emissions for the CHP gas engine plant do however correspond to the relevant limits in the Medium Combustion Plant Directive for 'new plant'. As the CHP gas engine is technical 'existing plant' it is considered BAT for existing plant to implement limits in line with new plant which are significantly tighter.

We would not wish, by applying our permitting actions in an onerous way, to inadvertently encourage the operator to re-instate the interlocks so as to thus fall under less stringent emission limits with a longer timescale for implementation. Taking the aspects outlined above into account, we have determined, that the pragmatic approach is to permit the Energy Centre.

This will allow the infrastructure to continue to provide heat and power to the campus whilst ensuring relevant BAT controls are in place. We will also insert improvement conditions in the permit which will allow us to work with the Operator to establish more reliable modelling and determine whether existing BAT is sufficient to prevent impact on air quality or whether further measures are required to minimise emissions (see section 5.2).

## **5.1 Emissions limits**

We have set the following emissions limits for NO<sub>2</sub>:

- CHP engines 95 mg/m<sup>3</sup> (at 15% Oxygen)
- Boilers 200 mg/m<sup>3</sup> (at 3% Oxygen)

We consider the combustion plant to be 'existing plant' as defined under the MCPD, as it was put into operation before 20 December 2018. The CHP gas engine plant is however able to achieve emissions limits in line with those of 'new plant' as defined under the MCPD. Considering the conclusions of the air quality modelling that emissions are not insignificant, that the plant has the ability to meet new plant limits and the site is located in an AQMA, we have set limits for the CHP gas engines in line with 'new plant'. These tighter limits are considered to represent BAT. These emission limits will remain unless we determine tighter emissions limits are appropriate in line with improvement condition IC6 to IC9.

### **5.1.1 Splitting emission references**

Even though some emissions are discharged via common stacks, we have referenced the two CHP engines separately (A1.1 and A1.2) and three boiler separately (A2.1, A2.2 and A2.3). This is to allow ELVs to be set separately for each combustion plant in line with IC9 in the event different or a combination of abatement techniques are applied to each plant (see section 5.2)

## **5.2 Improvement conditions**

Considering the point outlined above, that this plant is operational infrastructure serving the college campus and the need for us to work with the Operator to ensure that emissions are minimised in practice, we have inserted Improvement conditions. We have specified dates for these improvement conditions to be completed however considering the national impact of Covid-19 we have inserted the ability for dates to be agreed with the Environment Agency to account for the delays which maybe encountered.

### **5.2.1 Improvement condition IC1**

This condition has been inserted to allow the Operator to provide a definition of start up and shut down periods once the plant is commissioned to the Environment Agency for agreement and approval.



### 5.2.2 Improvement condition IC2

All combustion plant including those <1MWth are medium combustion plant and are aggregated into the Chapter II combustion plant. They are therefore required to be operated in line with BAT. This condition requires the operator to demonstrate that a procedure is in place to ensure all combustion plant <1MWth are operated in line with BAT.

### 5.2.3 Improvement condition IC3

The Applicant has identified that there are some remedial actions required to bring fuel and oil tank secondary containment up to CIRIA 736 guidance or equivalent standard. This condition requires the operator to demonstrate that this has been completed.

### 5.2.4 Improvement condition IC4

This condition has been inserted as the measured emission results provided by the Applicant are close to the emission limits stated in the permit. We therefore require the Operator to implement appropriately frequent monitoring to demonstrate that they are able to maintain compliance with the emission limit values.

### 5.2.5 Improvement condition IC5

This condition has been inserted as medium combustion plant are usually monitored annually. Under improvement condition IC4, we have required that emissions are frequently monitored. Improvement condition IC5 will allow the Operator to demonstrate through emission reporting, whether or not they have achieved compliance with emissions limits and to provide justification to determine whether a reduction in monitoring frequency is appropriate.

### 5.2.6 Improvement condition IC6

This condition has been inserted to address the issues associated with the air dispersion modelling submitted under this Application. The modelling was considered to be significantly over conservative and therefore the conclusions cannot be used to determine whether emissions are significant as they are likely to be an overestimation.

The Operator will be required to revise their air dispersion modelling to address the overly conservative aspects outlined in this document and resubmit their revised modelling to the Environment Agency for review. This will ensure that the air dispersion modelling reflect actual emissions from the Energy Centre and more reliable conclusions can be determined.

### 5.2.7 Improvement condition IC7

This condition has been inserted to require the Operator to review the results of their revised air quality modelling submitted under IC6 and to determine whether their existing ELVs are sufficient or further measures are required to minimise emissions and demonstrate BAT. The Operator will put forward their arguments for both outcomes to the Environment Agency for written agreement. This will allow us to determine whether the Operator needs to implement further techniques to meet revised emissions limits in practice.

### 5.2.8 Improvement condition IC8

This condition has been inserted in the event the review submitted under improvement condition IC7 concludes further emission reduction measures are required.

The Operator will be required to review options for reducing emissions to air and demonstrate through evidence which option can be considered to represent BAT based on capability, impact on air dispersion modelling and cost. This will allow the Environment Agency to assess the Operator's proposals for further abatement and determine whether they can be considered to represent BAT.

### 5.2.9 Improvement condition IC9

This condition has been inserted in the event the review submitted under improvement condition IC7 concludes further emission reduction measures are required. The Operator will be required to fully outline the details of the proposed emissions reduction measure or measures put forward

under IC8, along with timescales for implementation. The Operator will also be required to propose revised emissions limits values based on the capabilities of the proposed emissions reduction measure or measures. This will allow the Environment Agency to ensure the agreed emissions abatement measures appropriately installed, within an appropriate timescale. It will also allow us to determine that appropriate emissions limits are set based on the capability of the revised proposals.

#### 5.2.11 Summary

We are satisfied that this approach is pragmatic considering the site history. By implementing these improvement conditions, the plant will be able to continue to supply heat and power to the college campus whilst strict BAT and MCPD emissions limits for 'new plant' are in place to minimise emissions to the environment. This approach will also ensure controls are in place to allow the Environment Agency review the Energy Centre plant to determine whether the plant can achieve the requirements of the permit and minimise impact on air quality or whether further measures need to be implemented in practice in order to reduce emissions.

### **6 Emissions of noise**

The Operator has confirmed they will undertake regular inspections, testing and maintenance. A number of attenuation measures have been implemented and the Operator has demonstrated that the majority of the plant in the Energy Centre is contained within a building which is mostly below ground level. Further information is provided below:

- The two engines, boilers and generators are within buildings and gas engines are additionally housed in separate acoustic protection containers, therefore noise arising from this plant is not audible outside the building. This excludes the Flowers building standby generator which is tested intermittently and is located on the roof of the building inside acoustic protection.
- Heat produced in the atmosphere of the room containing the boilers and gas engines is removed outside using fans and an exhaust on which a silencer has been installed. The fans undergo regular inspections, testing and maintenance.
- Energy Centre dry air coolers are not required to be routinely used, as waste heat is used to pre-heat the district heating system water. The coolers are managed by the contracted Energy Centre operator who undertakes routine inspection which is managed under their electronic Planned Preventive Maintenance System. Reactive maintenance is managed through SCADA.

We have undertaken an assessment of the noise risk associated with the combustion plant and have used a qualitative noise screening approach to determine whether noise can be considered a significant risk. We have also reviewed whether there is justification for further noise modelling and noise management plans. Taking into account the containment of combustion operations, activity type, operational time, operation size, location and receptor proximity to other major noise sources, we are satisfied that the noise risk posed is low and therefore further noise modelling and noise management plans are not required.

## **7 Plant with a thermal input of <1 MWth**

In line with RGN2, we have assessed the impact of all combustion plant under 1 MWth. Emissions from these plant have been taken into account in the existing background concentration in the air quality modelling. These plant will be operated in line with the <1 MWth operating procedures submitted in line with improvement condition IC2. This will apply to the plant in Table 5 below.

**Table 5 – plant <1 MW thermal input**

<b>Ref</b>	<b>Type</b>	<b>Fuel</b>	<b>Building</b>	<b>Number of units</b>	<b>System thermal input (kW)</b>	<b>Unit net thermal input (kW)</b>	<b>Purpose</b>	<b>Grid reference</b>
4	Boiler	Natural gas	53 Prince's Gardens	2	1,000	500	Heating	TQ 26839 79439
5	Boiler	Natural gas	58 Prince's Gardens	2	295	148	Heating	TQ 26851 79363
7	Boiler	Natural gas	58 Prince's Gardens Top Floor	1	40	40	Heating	TQ 26851 79363
8	Boiler	Natural gas	RCS1 Plant	1	88	88	Heating	TQ 26724 79214
9	Boiler	Natural gas	Bessemer	2	1,826	913	Heating	TQ 26698 79417
10	Boiler	Natural gas	RSM	3	375	125	Heating	TQ 26712 79433
11	Boiler	Natural gas	Southside	6	1,650	275	Heating	TQ 26954 79321
12	Boiler	Natural gas	Eastside	6	1,650	275	Heating	TQ 27035 79418
13	Boiler	Natural gas	Southside Mews	2	125	63	Heating	TQ 26911 79302
14	Boiler	Natural gas	Bessemer ramp	1	48	48	Heating	TQ 26737 79420
15	Boiler	Natural gas	Northside 13 Prince's Gardens	4	3,000	750	Heating	TQ 26945 79497
16	Boiler	Natural gas	Ethos radiant	1	190	190	Heating	TQ 26864 79481
17	Boiler	Natural gas	RODH Grow dome	1	88	88	Heating	TQ 26543 79410
20	Generator	Gas oil	Chemistry	1	540	540	Sprinkler pump	TQ 26613 79217

## **8 Oil and fuel storage**

The Applicant has reviewed their oil and fuel storage tanks against the requirement of our oil storage guidance and have demonstrated that their infrastructure meets the requirements. These include but are not limited to:

- Tanks are provided with bunds which can contain at least 110% of the volume of the largest tank or 25% of the volume of all tanks contained within it (whichever is the greater).
- Bunds which are painted with a coating resistant to the content of the tank.
- Bunds are not penetrated by any pipes
- Tank are fitted with high level alarms.
- Sight gauges, vent pipes and the pump that delivers oil to the point of use are contained within the bund.
- Fill point fitted with Drips tray.

As this is an existing site the Applicant has identified areas where in infrastructure needs to be reviewed to ensure it remains up to standard. They have identified that the suitability and repair of some bund coatings, strength and penetrability of a single breeze block construction wall and some paint finishes need to be reviewed in order to ensure they are up to the required standard for the tanks. To address this, we have included improvement condition IC3 in the permit which will require the Operator to undertake a review of all remedial works and provide timescales for completing this work to be agreed with the Environment Agency.

## Decision checklist

Aspect considered	Decision
<b>Receipt of application</b>	
Confidential information	A claim for commercial or industrial confidentiality has not been made.
Identifying confidential information	We have not identified information provided as part of the application that we consider to be confidential.
<b>Consultation</b>	
Consultation	<p>The consultation requirements were identified in accordance with the Environmental Permitting Regulations and our public participation statement.</p> <p>The application was publicised on the GOV.UK website.</p> <p>We consulted the following organisations:</p> <p>Health and Safety Executive</p> <p>Public Health England</p> <p>Director of Public Health</p> <p>Local Authority Environmental Health (Westminster)</p> <p>The comments and our responses are summarised in the <a href="#">consultation section</a>.</p>
<b>Operator</b>	
Control of the facility	We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with our guidance on legal operator for environmental permits.
<b>The facility</b>	
The regulated facility	<p>We considered the extent and nature of the facility at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN 2 'Defining the scope of the installation',</p> <p>The extent of the facility is defined in the site plan and in the permit. The activities are defined in table S1.1 of the permit.</p>
<b>The site</b>	
Extent of the site of the facility	The operator has provided a plan which we consider is satisfactory, showing the extent of the site of the facility. The plan is included in the permit.
Site condition report	The operator has provided a description of the condition of the site, which we consider is satisfactory. The decision was taken in accordance with our guidance on site condition reports and baseline reporting under the Industrial Emissions Directive.

Aspect considered	Decision
Biodiversity, heritage, landscape and nature conservation	<p>The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat.</p> <p>We have assessed the application and its potential to affect all known sites of nature conservation, landscape and heritage and/or protected species or habitats identified in the nature conservation screening report as part of the permitting process.</p> <p>We consider that the application will not affect any sites of nature conservation, landscape and heritage, and/or protected species or habitats identified. See key issues section for further information.</p> <p>Due to the type of activity we have consulted Natural England on our Habitats Regulations assessments, and taken their comments into account in the permitting decision.</p>
<b>Environmental risk assessment</b>	
Environmental risk	<p>We have reviewed the operator's assessment of the environmental risk from the facility.</p> <p>The operator's risk assessment is satisfactory.</p>
<b>Operating techniques</b>	
General operating techniques	<p>We have reviewed the techniques used by the operator and compared these with the relevant guidance notes and we consider them to represent appropriate techniques for the facility.</p> <p>The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit.</p>
Operating techniques for emissions that do not screen out as insignificant	<p>Emissions of long term NO<sub>x</sub> cannot be screened out as insignificant. We have assessed whether the proposed techniques are BAT and improvement conditions alongside stricter limits have been implemented to address this. Refer to section 5 in the key issues section of this document.</p>
Operating techniques for emissions that screen out as insignificant	<p>Emissions of Carbon monoxide and short term NO<sub>x</sub> have been screened out as insignificant, and so we agree that the applicant's proposed techniques are BAT for the installation.</p> <p>We consider that the emission limits included in the installation permit reflect the BAT for the sector.</p>
<b>Permit conditions</b>	
Raw materials	<p>We have specified limits and controls on the use of raw materials and fuels to ensure fuels are low sulphur.</p>
Improvement programme	<p>Based on the information on the application, we consider that we need to impose an improvement programme. Refer to section 5.2 in the key issues section of this document.</p>
Emission limits	<p>We have decided that emission limits should be set for the parameters listed in the permit.</p>

Aspect considered	Decision
	<p>Oxides of Nitrogen (NO<sub>x</sub> and NO<sub>2</sub> expressed as NO<sub>2</sub>) have been identified as being emitted in significant quantities, Therefore ELVs and equivalent parameters or technical measures have been set. Limits have been imposed in line with the requirements of the Medium Combustion Plant Directive MCPD for this type of plant and will be reviewed in line with improvement conditions IC6 to IC9.</p> <p>It is considered that the ELVs/ equivalent parameters or technical measures described above will ensure that significant pollution of the environment is prevented and a high level of protection for the environment secured.</p>
Monitoring	<p>We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified.</p> <p>These monitoring requirements have been imposed in order to meet the requirements of the Medium Combustion Plant Directive (MCPD) to monitor emissions from Medium Combustion Plant with a rated thermal input greater than 20 MW. However as this is a Chapter II plant and considering the Applicant's air quality modelling as well as their monitored results, we have set monitoring to be reviewed and agreed in line with improvement condition IC4 (see section 5.2).</p> <p>Based on the information in the application, we are satisfied that the Operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate.</p> <p>We have specified process monitoring based on the practicality of taking readings via the Operator's proposed systems. The Operator has confirmed the type of process monitoring they can undertake and we are satisfied that the parameters in the permit will allow demonstration that the engines are being operated to an appropriate standard in line with the manufacturer's specifications and are achieving the expected temperatures and pressures.</p>
Reporting	<p>We have specified reporting in the permit in line with the annual monitoring requirements of the permit. This is in line with the monitoring and reporting requirements of the Medium Combustion Plant Directive.</p>
<b>Operator competence</b>	
Management system	<p>There is no known reason to consider that the operator will not have the management system to enable it to comply with the permit conditions.</p> <p>The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental permits.</p>
Relevant convictions	<p>The Case Management System has been checked to ensure that all relevant convictions have been declared.</p>
Financial competence	<p>There is no known reason to consider that the operator will not be financially able to comply with the permit conditions.</p>
<b>Growth Duty</b>	
Section 108 Deregulation	<p>We have considered our duty to have regard to the desirability of promoting</p>

<b>Aspect considered</b>	<b>Decision</b>
Act 2015 – Growth duty	<p>economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.</p> <p>Paragraph 1.3 of the guidance says:</p> <p>“The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”</p> <p>We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.</p> <p>We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.</p>



## Consultation

The following summarises the responses to consultation with other organisations, our notice on GOV.UK for the public and the way in which we have considered these in the determination process.

### Responses from organisations listed in the consultation section

<b>Response received from</b>
Public Health England
<b>Brief summary of issues raised</b>
<ul style="list-style-type: none"> <li>• Emissions of potential concern are carbon monoxide and nitrogen dioxide to air.</li> <li>• NO<sub>2</sub> as an annual mean may result in an impact</li> <li>• Mitigation may be required due to high backgrounds</li> <li>• The permit holder shall take all appropriate measures to prevent or control pollution, in accordance with the relevant sector guidance and industry best practice.</li> </ul>
<b>Summary of actions taken or show how this has been covered</b>
<p><u>Short term NO<sub>x</sub> and NO<sub>2</sub> and Carbon monoxide</u></p> <p>We have assessed the Applicant's air quality modelling and we are satisfied that Carbon monoxide emissions and short term NO<sub>x</sub> emissions screen out as not significant. We are therefore satisfied these emissions will not result in an impact on the environment (refer to key issues section for further information).</p> <p><u>Long term NO<sub>x</sub> and emissions control measures</u></p> <p>We have assessed the Applicant's air quality modelling and identified the potential for environmental standards to be breached. We note however that the modelling may be overly conservative (see section 3.3 for details) so we cannot conclude that emissions will be significant. Based on our assessment of emissions, however we can determine that further assessment of emissions reduction techniques is required in order to demonstrate whether the site has implemented appropriate BAT.</p> <p>As part of the application process, the Applicant has assessed the potential for implementation of additional emissions reduction measures and tighter emissions controls. Due to the location, use of the site and the overly conservative air dispersion modelling, there are significant implications which require further work to be undertaken in order to ensure that appropriate emissions reduction measures and emissions limit are implemented for this site in line with BAT. As the site is currently operational, and supports the college campus, we have taken a pragmatic approach and implemented a series of Improvement conditions (refer to section 5).</p> <p>The Operator will be required under improvement condition IC6 to revise their air quality modelling parameters to ensure they are not overly conservative in order to determine whether for the emissions limits we have set in the permit remain appropriate or whether further emissions reduction measures are required.</p> <p>Section 5.2 of this document outlines that in the event the operator's emissions dispersion modelling demonstrates that further measures are required, the operator will be required to review the emissions reduction measures available to them and propose the best options to reduce emissions. Based on this review, the Operator will be required to implement the emissions reduction approach as agreed with the Environment Agency and propose emissions limits based on the capability of the plant which they will implement as agreed by the Environment Agency.</p> <p>We are satisfied based on the site being operational and the air quality in the local area that we have taken a pragmatic approach to work with the operator to minimise their emissions. We have ensured that there are sufficient controls in place to ensure BAT is implemented and that strict emissions limits are in place to minimise emissions as far as practicable to ensure there is no significant impact on local air quality.</p>

<b>Response received from</b>
City of Westminster – Environmental Services
<b>Brief summary of issues raised</b>
<p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Long term concentrations of Nitrogen dioxide were found to be potentially significant.</li> <li>• At 73 receptors, the predicted environmental contribution will be above 40 mg/m<sup>3</sup>. This is not considered acceptable.</li> <li>• Explain the mitigation measures</li> <li>• More progress on a feasibility study on options for NOx control at permit stage.</li> <li>• The timeline for installing NOx control measures</li> <li>• Request City Council be consulted on revised abatement plan document.</li> </ul> <p><b>Noise</b></p> <ul style="list-style-type: none"> <li>• The standby generators outlined in the permit application are not assessed in this report.</li> <li>• Measured sound not of sufficient duration to address variations in sound</li> <li>• Not likely to adequately account for fluctuations in background noise levels.</li> <li>• Test with only 1 of the 2 units running, impact of both units has not been assessed.</li> <li>• The noise report does not assess the impact from the emergency generators.</li> <li>• Noise assessments not sufficiently robust to reach the conclusion 'no significant environmental impact'.</li> </ul> <p><b>Global Warming</b></p> <ul style="list-style-type: none"> <li>• CO<sub>2</sub> emissions from the Energy Centre prior to and following the installation of new plant are included - but not the impact on the College's site wide emissions. Without this information the indicative site-wide carbon savings cannot be verified. It is considered that this information should be provided.</li> </ul> <p><b>Accidents</b></p> <ul style="list-style-type: none"> <li>• Referenced plans and documents, not provided.</li> </ul> <p><b>Other considerations</b></p> <ul style="list-style-type: none"> <li>• Should planning permission be required, an air quality assessment, air quality neutral assessment and noise impact assessment should be provided.</li> </ul>
<b>Summary of actions taken or show how this has been covered</b>
<p><b><u>Long term NO<sub>x</sub> emissions control measures, feasibility study and timescale</u></b></p> <p>We have addressed these issues – see our response to Public Health England's comments above</p> <p>City of Westminster Council were consulted on the plan for assessed of emissions abatement options see response below</p> <p><b><u>Noise</u></b></p> <p>We have addressed noise issues in section 8 of this document.</p> <p>We have undertaken an assessment of the noise risk associated with the combustion plant and have used a qualitative noise screening approach to determine whether noise can be considered a significant risk. We have also reviewed whether there is justification for further noise modelling and noise management plans. Taking into account the containment of combustion operations, activity type, operational time, operation size, location and receptor proximity to other major noise sources, we are satisfied that the noise risk posed is low and therefore further noise modelling and noise management plans are not required.</p> <p>The permit conditions (3.4.1 to 3.4.2) are sufficient to ensure that emissions of noise and vibration do not cause pollution. The operator is required to submit and implement mitigation measures in line with an approved noise and vibration management plan in the event activities on site are causing pollution.</p> <p>Based upon the information provided in the application, we are satisfied that appropriate measures are in place to prevent or minimise emissions of noise and vibration from causing</p>

pollution.

### **Global Warming**

The Applicant is not required to provide an assessment for activities beyond the permit boundary, therefore an assessment the Carbon dioxide emissions from the wider College site is not required.

### **Accidents**

The Applicant has provided a description of their accident management procedures and an associated risk assessment. We have reviewed this information and we are satisfied the Applicant's proposals are satisfactory.

### **Planning permission and chimney height approval**

The approval of planning permission with the associated chimney height is a consideration for the Planning Authority, we have reviewed the comments and no action is required.

## **Response received from**

City of Westminster – Environmental Services

## **Brief summary of issues raised**

### **Air quality**

- Unable to identify which of the options the applicant is proposing to install and the predicted impacts of the final selected solution.
- An updated emissions model was run assuming the burners were replaced and CHP plant had the SCR equipment fitted. It is not clear from the information provided about the challenges of the SCR installation, if this option is being proposed.
- If the SCR installation isn't being proposed, it would be useful to provide a separate assessment on the air quality improvement for introducing Option 2 (Modification to gas register + FGR on each boiler), and Option 3 (replacement of burners) at the sensitive receptors, by running the model for each of the different options, excluding SCR allow for comparison of predicted impacts.

### **Noise**

- The noise assessments didn't provide sufficiently robust information to be able to reach the conclusion that the plant under consideration will not cause a significant environmental impact. In the Council's previous response, we considered the reports should be updated. Our position on this remains.

### **Global Warming**

- As noted in our previous response, it would be helpful if indicative site-wide carbon savings could be provided. We also recommend the applicant provides information on their decarbonisation strategy, to move away from the use of gas fired CHP in the future.

### **Accidents**

- The previous submission made reference to the existence of various plans and documents, however as these were not provided, it was not possible to comment on them. No further information has been received about this.

### **Other considerations**

- Should planning permission be required for this installation, an air quality assessment, air quality neutral assessment and noise impact assessment should be provided. The City Council's assessment of these documents through the planning process will be undertaken in line with the City Plan and could therefore result in alternative comments to those outlined above.
- The applicant is advised to make any applications necessary for chimney height approval under the Clean Air Act 1993.

## **Summary of actions taken or show how this has been covered**

### **Air Quality**

We have addressed these issues – See previous response to City of Westminster in the previous consultation above.

### **Noise**

We have addressed these issues – See previous response to City of Westminster in the previous consultation above.

### **Global warming**

See previous response to City of Westminster indicative site-wide carbon savings.

In regards to decarbonisation strategy, the operator has implemented measures to minimise carbon emissions such as the implementation of CHP which is currently considered to represent BAT for the type of combustion plant and meets the site's energy demand. We are not required to assess future measures for developing and reviewing energy production technologies as part of this determination. The permit requires the operator to report on energy usage every year and we will use this information to check compliance with the Combustion Sector BREF and Medium Combustion Plant legislation.

### **Accidents**

We have addressed these issues – See previous response to City of Westminster in the previous consultation above.

### **Other considerations**

The approval of planning permission with the associated chimney height is a consideration for the Planning Authority, we have reviewed the comments and no action is required.