Chapter 15

Other Effects Considered

CONTENTS

15. Other Effects

15.1 Introduction

15.1.1 This chapter addresses topics that are not specifically addressed in the context of the main topic chapters elsewhere in this PEIR, or effects which are not considered to merit a chapter in their own right, but have been considered in line with requests from consultees, including through the Scoping Opinion.

15.1.2 This chapter therefore addresses the following topics:

- How waste generating by the proposed development will be dealt with;
- Public health;
- Aviation; and
- Health and safety.

15.1.3 Although not specifically requested within the Scoping Opinion or consultation, APL has also provided an assessment of Major Accidents or Disasters and Climate Change for completeness.

15.2 Waste

a) Construction

15.2.1 The amount of excavated material is dependent on which route is selected for the new Access Road – Option A or Option B. The amount of excavated material associated with Option B is currently under further investigation. The amount of excavated material will be confirmed within the DCO Application. It is expected, however, that there will be excavated material which will be stored within the Laydown Area. Management of waste will be controlled and managed via a Site Waste Management Plan (SWMP) which will be submitted as part of the DCO Application.

15.2.2 For the purposes of the traffic assessment in **Chapter 12: Traffic, Transport and Access** it has been assumed that none of the excavated material will be used, as this is the worst case scenario. However, the suitability of the excavated material can only be determined during construction following a detailed geotechnical site investigation by the contractor.

15.2.3 The laying of the Electrical and Gas Connections will involve the excavation of a trench or drilling, temporary placement of the excavated soil and then backfilling with soil. The Gas Connection will require the construction of the AGI. No surplus waste materials are expected to arise from this activity if excavated material is reused onsite, which is normal practice.

15.2.4 The Project will operate in full accordance with the Waste Framework Directive (Ref. 15.1), together with the Environmental Permitting (England and Wales) Regulations 2016 (Ref. 15.2) and the Waste (England and Wales) Regulations 2011 (Ref. 15.3) (where relevant).

15.2.5 Section 5.14 of the Overarching National Policy Statement for Energy (NPS EN-1) (Ref. 15.4) requires that waste is managed through the 'waste hierarchy'. It explains the relationship with the environmental permitting regime and sets assessment principles to be used by the Secretary of State (SoS) in determining an application for development consent. The waste hierarchy consists, in order of preference, of:

- Prevention;
- Re-use;
- Recycling;
- Other recovery (e.g. energy recovery); and
- Disposal.

15.2.6 In accordance with this 'waste hierarchy', Section 4.3 of the South West Wales Regional Waste Plan (Ref. 15.5) suggests that the most effective environmental solution is to minimise the generation of waste. Where this is not practical, products should be reused. Failing that, products should be recycled and only if no other option is appropriate should waste be disposed of through incineration or landfill (paragraph 4.3.1). Regard is also given to Technical Advice Note 21 (TAN21) (Ref 15.6), and the National Waste Strategy (Ref 15.7).

15.2.7 The SWMP will be submitted as part of the DCO Application and will demonstrate how waste volumes are to be minimised and managed during construction. Measures for controlling waste will include, amongst others, the appropriate storage of excavated spoil and testing for Waste Acceptance Criteria (WAC) to determine whether it can be re-used on or off-site.

15.2.8 The treatment of waste will follow the waste hierarchy set out in the Regional Waste Plan (Ref. 15.5), Technical Advice Note 21 (TAN21) (Ref. 15.6), and the National Waste Strategy (Ref. 15.7), with minimisation at source through construction planning and Project design, and the Engineering, Procurement, and Construction (EPC Contractor) will aim to reuse, or recycle waste where feasible.

15.2.9 The National Waste Strategy July 2015 Progress Report (Ref. 15.8) also confirms that there is good provision of waste management capacity in South West Wales to cover all types of waste arisings including industrial, construction and demolition, and hazardous waste. There are licensed thermal treatment, MBT (Mechanical Biological Treatment) and physical treatment facilities on the northern and eastern edges of the City of Swansea. There are also hazardous waste disposal services located at Swansea Enterprise Park.

15.2.10 The routes used for construction traffic entering and leaving the Project Site are described in Section 3.4 (d) of this PEIR. These routes will be used during construction for the removal of any waste materials.

b) Operation

15.2.11 During operation of the Power Generation Plant, a small amount of waste will arise. This generated waste will include waste which is both hazardous and non-

hazardous in nature. Appropriate treatment facilities exist locally, as discussed above. Final types and volumes have not yet been confirmed but will be restricted to the following:

- General office wastes;
- Used gas turbine air intake filters. These are typically replaced annually for generating station operating constantly and hence will require much less frequent replacement for this Project. The air filters contain approximately eight tonnes of plastic and steel a substantial proportion of which can be recycled or reused;
- Small quantities of water from compressor blade washing (five cubic metres (m^3) of water per month);
- Separated oil/sludge from any oil/water separators on site, and used oil, chemicals or chemical containers (approximately one tonne per year); and
- Other miscellaneous wastes (e.g. scrap metal, used gas bottles).

15.2.12 Only small quantities of potentially hazardous waste from the above list will be stored on the Generating Equipment Site at any time (final types and volumes have not yet been confirmed). Such substances will be held in secured containers under appropriate waste management legislation.

15.2.13 All waste management practices will be in full accordance with regulatory requirements under relevant legislation and the Waste Framework Directive (Ref. 15.1), and with industry best practice. Waste will be treated and disposed of by licensed contractors. Routes for waste removal would be as per operational access requirements described in Section 3.4 (d).

c) Decommissioning

15.2.14 A range of waste types are likely to arise during decommissioning and will include materials such as structural steel, metal cladding, and block and concrete waste, all of which will be suitable for recovery and reuse or recycling. Redundant generating equipment will include the turbine, ducting and pipework, generator and associated machinery and controls. These will be composed primarily of recyclable metals and other materials suitable for specialist commercial recycling and could also involve re-use of equipment elsewhere. It is not predicted that significant quantities of residual waste requiring disposal will arise during decommissioning.

15.2.15 Based on the above, it can be concluded that that no significant effects in relation to waste are predicted to arise either during construction, operation or decommissioning.

15.3 Public Health

15.3.1 In its response to the Scoping Report (letter dated 23rd July 2014), Public Health England (PHE) identified the local population as a sensitive receptor. The effects on public health of impacts to air quality (Section 6.7), noise (Section 7.7), groundwater contamination (Section 9.7) and land contamination (Section 10.6) have been assessed and the findings included in the relevant topic chapters of this

PEIR. The relevant topic chapters also describe the risk assessment undertaken, the proposed mitigation measures and any residual effects. These assessments are summarised below, along with health risks associated with electromagnetic fields.

a) Electromagnetic Fields

15.3.2 An Electromagnetic Field (EMF) is a physical phenomenon that is produced by electrically charged objects. EMFs comprise electric and magnetic fields:

- Electric fields: are the result of voltages applied to electrical conductors and equipment. Fences, shrubs and buildings easily block electric fields.
- Magnetic fields: are produced by the flow of electric current; however unlike electric fields, most materials do not readily block magnetic fields.

15.3.3 UK power developers rely on national guidelines in accordance with Government advice to ensure that new installations consider health risks based on current knowledge. In the absence of statutory regulations to limit the public exposure to power-frequency electric or magnetic fields, guidelines published in 1998 by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) (Ref. 15.9) are adopted in the UK as set out in National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref. 15.10).

15.3.4 Underground cables, as proposed, do not give rise to electric fields above ground due to the shielding effect of the cable sheath. This is explained in the British Insulated Callender's Cables (BICC) Electric Cables Handbook (Ref. 15.11).

15.3.5 In 1998, the ICNIRP issued guidelines reference level of 100 μT for public exposure to magnetic fields at power frequencies. Underneath power lines, magnetic fields can be around 20 μT (Ref. 15.12), which is considerably lower than the ICNIRP guidelines. The intensity of both electric fields and magnetic fields also diminishes with increasing distance from the source.

15.3.6 The above-ground components of the Electrical Connection will also lie within the Substation where there are already EMFs present that were considered as part of the application for the Substation; they will not make a significant difference to the EMFs already present. It should also be noted that the general public will not spend any prolonged time in close proximity to the Electrical Connection or to the Substation.

15.3.7 The general public will thus not be exposed to any increase in EMFs from the Electrical Connection and there will be no significant effects arising from EMFs.

b) Air Quality

i. Construction and Decommissioning

15.3.8 The results of the air quality assessment are set out in **Chapter 6: Air Quality**.

15.3.9 The limited numbers of vehicle movements associated with the construction of the Project means that significant effects on human health from exhaust emissions are not anticipated.

15.3.10 The likely significant effects on human health regarding air quality from construction and decommissioning of the Project relate to dust/particulate matter generated from construction activities (e.g. excavation for new foundations, Gas and Electrical Connections). These small particles (<10 µm) can give rise to effects on human health when inhaled.

15.3.11 With the implementation of dust control measures through the Outline CEMP (Appendix 3.1) the effects of the Project are predicted to be negligible or low in respect of human health and nuisance dust during construction and decommissioning. Additionally, the majority of particulates from construction and decommissioning activities settle within a very short distance of any construction site. Therefore, no significant effects are predicted in relation to human health.

ii. Operation

15.3.12 The main likely significant effects on human health in relation to air quality arising from operation of the Project are associated with the stack emissions from the combustion of natural gas in the Generating Equipment releasing emissions of NO_x.

15.3.13 However, modern gas-fired power plants are inherently clean and produce far fewer emissions than other fossil fuel power plants (e.g. coal) when compared on an energy output basis. Emissions of NO_x are strictly limited under national and international guidelines such as the Industrial Emissions Directive (IED) (Ref. 15.13) and the 2017 guidelines on Best Available Technologies (BAT) for large combustion plants (Ref, 15.14). Operation of the Generating Equipment will also be regulated by NRW under an Environmental Permit, which will limit emissions in line with national guidelines.

15.3.14 Stack height sensitivity testing was undertaken using the emissions data set out in **Chapter 6: Air Quality**, Table 6.7 and meteorological data from 2012-2016. This resulted in a conservative estimate of the minimum stack height required for the adequate dispersion of emissions ensuring there would be no impact from emissions on human health during operation. This would also ensure legislative limits are adhered to and any impacts to other identified receptors are prevented.

15.3.15 It was considered that an appropriate metric for determining a suitable stack height was that nitrogen deposition over the most affected ecological designated site (Lletty Morfil SINC)) should not exceed 1% of the critical load for that site whilst also ensuring that impacts on annual mean nitrogen dioxide were below 1% of the air quality objective for the protection of human health. No significant health effects are anticipated as a result of the operation of the Project.

15.3.16 During the operational phase, there may be some emissions from vehicles accessing the plant for maintenance reasons. However, these will Negligible and therefore will not have a significant effect on human health.

c) Noise

i. Construction and Decommissioning

15.3.17 Excavation for foundations for buildings across the Project Site, delivery of plant and excavation for laying the Gas and Electrical Connection during construction could lead to increases in noise in the surrounding area. This will, however, be a temporary source of noise. The noise assessment is presented in **Chapter 7: Noise and Vibration**.

15.3.18 This noise assessment has considered the impacts on the nearest residential properties (and therefore local residents) in accordance with BS4142 (Ref. 15.15). The change in noise level from the baseline survey data to that predicted during construction/decommissioning was then calculated, see Section 7.7.

15.3.19 Construction noise mitigation measures are included in the CEMP (Appendix 3.1). In order to keep noise effects from the construction phase to a minimum, all construction activities would be carried out in accordance with the recommendations of BS5228.

15.3.20 It is anticipated that core working hours during construction will be limited by a Requirement in the DCO to between 08.00 and 18.00 on weekdays, and between 08.00 and 13.00 hours on Saturdays and public holidays. Should it be necessary to work outside these core hours for certain activities, this would be with the prior written agreement of CCS. These limits will not apply during commissioning and testing of the Project.

15.3.21 With the implementation of mitigation measures to control noise from construction activities as set out above and in the Outline CEMP (Appendix 3.1), the residual effect at each sensitive receptor is therefore predicted to be **Negligible** during construction.

ii. Operation

15.3.22 During operation, noise could occur from the rotating components of the Generating Equipment (e.g. the Gas Turbine Generator) and there will be small amounts of noise generated by the AGI as it regulates the flow of gas from the National Gas Transmission System to the Generating Equipment.

15.3.23 There may also be a limited amount of noise from the Access Road from the small number of vehicles accessing the Generating Equipment Site for operation and maintenance activities.

15.3.24 In respect of noise and vibration during operation, the embedded mitigation to be incorporated into the design, include:

- The Gas Turbine Generator and major compressors are to be housed in acoustic enclosures. In addition, these will be housed within secondary acoustic enclosures specified at 75 dB(A) Sound Pressure Level at 1 m;
- Gas turbine air inlet filter and ventilation apertures are to be fitted with silencers, and designed such that all sensitive noise receptors benefit from screening and/or directivity corrections;
- Silencers are to be fitted in the exhaust stack. Due to the impracticality of screening stack noise, discharge noise will be controlled using these silencers, which will be tuned to attenuate low frequencies from the Gas Turbine Generator exhausts;
- All plant items will be controlled to minimise noise of an impulsive or tonal nature; and
- Noise breakout from the stack will be controlled using silencers. To achieve the predicted noise levels used in this assessment, noise from the top of the stacks should not exceed the maximum octave band sound power levels identified in Table 7-8.

15.3.25 A Requirement in the DCO (as set out in Appendix 3.1) will impose maximum boundary noise limits which are not to be exceeded during operation of the Project. The following measures will serve to minimise the impact of noise from the Project:

- Plant items will be silenced or otherwise controlled through regular maintenance since tonal or impulsive noises are considered more annoying than continuous noise sources;
- Inherently quiet plant items will be selected wherever practicable Acoustic lagging and low noise trims will be fitted to all pipe-work and noise generating valves; and
- High performance acoustic enclosures will be considered for all plant items where practicable, not overlooking smaller plant items such as compressors and pumps.

15.3.26 If any non-normal and/or emergency operations were to lead to noise levels in excess of the agreed limits specified in the DCO Requirements, the operator will inform the local authority and residents of the reasons for these operations, the anticipated emergency period and the steps to be taken to bring it back to compliance.

15.3.27 Therefore, following the mitigation measures as outlines above, the impact of noise from the Power Generation Plant on human health will not be significant.

15.3.28 The residual effect at each of the sensitive receptors is therefore predicted to be **Negligible** during operation and therefore not significant.

d) Pollution and Contamination

15.3.29 A desk based assessment has been carried out to assess the baseline geology and ground conditions underlying the Project Site in **Chapter 10: Geology, Ground Conditions and Hydrogeology**.

i. Construction and Decommissioning

15.3.30 During construction and decommissioning of the Project, the main potential impacts to human health are from; disturbance and mobilisation of potentially contaminated soils, groundwater, ground gas impacting on human health, and ground instability.

15.3.31 After implementation of good practice methods and mitigation measures such as working within and adhering to a detailed CEMP, an outline of which can be found at Appendix 3.1, the potential effects on human health are predicted to be **Negligible**, and therefore not significant.

ii. Operation

15.3.32 During the operational phase, there is the potential for the contamination of surface water resulting from the flushing of silts and hydrocarbons from areas of hardstanding within the Project Site. However, such impacts would be controlled by the embedded mitigation measures implicit within the Project, comprising industry standard/good practice and measures required to ensure legislative compliance, contained within an operational environmental management plan secured through the Environmental Permit (EP).

15.3.33 The effects following the implementation of embedded mitigation are therefore predicted to be **Negligible**, and therefore not significant.

15.4 Climate Change

15.4.1 Climate change impacts have been considered throughout each of the individual topic chapters, where relevant. Climate resilience has therefore been built into the Project design to reduce effects from climate change. The following outlines the different topics associated with climate change and reference the relevant chapters within this PEIR:

- *Ecology*: Examples of the potential ecological consequences of climate change include the shifting of species ranges, loss of species at the limits of their ranges, eventual disruption of ecological processes, and damage to the wider functioning of ecosystems. However, these effects can be lessened on species through the strengthening of ecological networks to allow species to migrate as the climate changes. The proposed ecological mitigation (see **Chapter 8: Ecology**) and landscaping scheme (see **Chapter 11: Landscape and Visual Effects**) for this Project seeks to strengthen connectivity in the wider area and would therefore contribute to the efforts to provide opportunities for species to migrate as the climate changes.
- *Air Quality:* The effects of the Project on climate change from emissions have been assessed in **Chapter 6: Air Quality**. The Project's carbon emissions are considered marginal in relation to overall UK emissions and, therefore, considering current policy, impacts on climate change from carbon dioxide emissions are not considered significant.
- *Flood Risk:* The topic of climate change has also been addressed in **Appendix 9.1: Flood Consequences Assessment**, which considers flood

risk at the Project Site. An allowance has been made for climate change (predicted more frequent and/or more severe rainfall events than historically has been the case) in the attenuation storage calculations of 30% above the 1 in 100 year flood event. This will mean sizing of culverts in the drainage design to allow for these potential more severe rainfall events. The impacts on climate change from flooding are therefore not considered significant.

15.5 Aviation

15.5.1 APL engaged with the Civil Aviation Authority (CAA), Ministry of Defence (MoD), Abertawe Bro Morgannwg University Health Board (which uses air ambulance services in relation to Morriston Hospital) and CCS between June and November 2014 to seek their views on the likelihood of the Project affecting aviation assets and infrastructure. In particular, their views were sought on the effect of construction of a stack of up to 40 metres (m) at the Project Site (the anticipated maximum height at the time of consultation)

15.5.2 The MoD replied on 17th September 2014 to confirm that the Project falls outside of any safeguarding areas and therefore it has no objection to the Project.

15.5.3 The CAA identified the potential to affect civil aviation in regard to the height of the stack with particular reference to Swansea Airport. As part of the EIA the safeguarding zone mapping held by CCS has been consulted and the Project falls outside these zones. As a result it is concluded that the Project will not affect civil aviation activity.

15.5.4 Abertawe Bro Morgannwg University Health Board confirmed in an email dated 23rd February 2015 that the stack will be just over 1.5 kilometres (km) away. As such they will not affect the (Bond Air Services) operations in and out of Swansea Morriston Hospital.

15.5.5 The CAA, Mod, Abertawe Bro Morgannwg University Health Board and CCS will be re-consulted with a maximum stack height of 45 m (increased from the 40m previously consulted on), and the location of the stack and construction cranes. The final ES will provide the results of that consultation, including any mitigation required.

15.6 Health and Safety

a) Construction and Decommissioning

15.6.1 The site manager will have the day to day responsibility for maintaining Health and Safety throughout the construction period. They will produce a risk assessment and method statement detailing how they will minimise the risk. An approved procedure which will:

- Identify the significant Health & Safety impacts that can be anticipated;
- Assess the risks from these impacts;
- Identify the control measures to be taken and re-calculate the risk;

- Report where an inappropriate level of residual risk is identified so that action can be taken.

15.6.2 There is a small risk of construction workers coming into contact with contaminated soils and groundwater during construction.

15.6.3 There will be no access to construction areas by the general public. The Project Site will be secured to avoid unauthorised access.

15.6.4 Traffic safety will be promoted by all project personnel to prevention and control traffic related injuries. Speed restrictions will be imposed onsite. This will also minimise disturbance of bare surfaces.

15.6.5 Mitigation measures could include:

- The provision of suitable Personal Protective Equipment (PPE), including footwear, masks, protective clothing and goggles.
- Eating, drinking and smoking will be limited to a designated 'clean' area of the site;
- Site welfare facilities will be made available;
- All workers will be required to wash their hands and remove overalls/boots when moving from 'dirty' to 'clean' areas of the site;
- Any soils excavated which are considered to be potentially contaminated will be reported to site management and left in situ and fenced off until their appropriate treatment; and
- Water inflows to excavated areas will be minimised by the use of lining materials, good housekeeping techniques and by the control of drainage and construction materials in order to prevent the contamination of ground water.

15.6.6 The employer will ensure that qualified first-aid can be provided at all times. Appropriately equipped first-aid stations will be easily accessible throughout the place of work.

b) Operation

15.6.7 Routine maintenance of the Generating Equipment would take place on average once every six months. Bi-annual inspections will also take place to assess general condition. Inspections to replace or refurbish combustion and turbine 'hot parts' equipment are typically carried out approximately every six years.

15.6.8 In the event of an issue with the Generating Equipment, alarms would signal any instance of abnormal operation. These alarms would not be audible externally. The plant would be shut down immediately in such instances and, if required, additional engineering staff would attend the Project Site. The Generating Equipment would not start up again until the issue had been resolved. Alarms would only be audible outside where there was an event affecting personnel safety such as a fire alarm. Operational maintenance is described in more detail in Section 3.4 of **Chapter 3: Project Site and Description**.

15.6.9 It is considered that effect on health and safety is **Negligible**, which is therefore not significant.

15.7 Major Accidents or Disasters

15.7.1 The Project's vulnerability to risk of major accidents and disasters is considered in the following sections. Details on appropriate prevention measures and mitigation for significant effects on the environment from such events are either provided in the sections below or within the referenced chapters.

a) Air Quality Events

15.7.2 In an air quality event where metrological conditions such as prevailing winds or inversion result in reduced air quality, the Project, as an emitter to air, has the potential to exacerbate the effect of the event. The effect of the Project on air quality has been considered within this PEIR. Details on the air quality assessment, prevention measures and appropriate mitigation to control the Project's emissions to air can be found in **Chapter 6: Air Quality**. Limits are also set within the Environmental Permit to regulate emission levels.

b) Engineering or Industrial Accidents

15.7.3 Due to fencing, and distance from residential areas, engineering and industrial accidents are limited to on-site workers. Existing legal protection for construction workers is considered to be sufficient to minimise any risk from major events to a reasonable level. Legislation in force to ensure the protection of workers in the workplace includes:

- Health and Safety at Work etc. Act 1974 (HSWA);
- The Management of Health and Safety at Work Regulations 1999;
- The Workplace (Health, Safety and Welfare) Regulations 1992;
- The Control of Substances Hazardous to Health Regulations 2002; and
- Construction (Design and Management) (CDM) 2015 Regulations.

15.7.4 Given the nature of natural gas there is an inherent risk of both fire and gas leak and explosion associated with the Project from its supply and use. The Project has been designed to comply with industry safety standards and to meet legislative requirements for safe operation.

c) Proximity to Other Third Party Infrastructure

15.7.5 The Project is in close proximity to other third party infrastructure features namely the Substation, Felindre Gas Compressor Station, Water Main along with other utilities such as the National Gas Transmission System.

15.7.6 Mitigation has been embedded via the design of the Project by implementing appropriate minimum distances and having due regard to the required standoff distances between the Project and these infrastructure features.

It is anticipated that potential major accidents and disasters resulting from third party infrastructure would be unlikely as the appropriate operational safety procedures relative to that installation would be implemented on a day to day basis, is regularly maintained and is closely monitored. In addition, the standoff distances from and to the Project would also take account of any effects from third party infrastructure on the Project. The Project is also being closed to the public and not in close proximity to residential areas/centres of population.

15.8 References

Ref. 15.1 Directive 2008/98/EC, Waste Framework Directive (2008), L 312/3.

Ref. 15.2 Environmental Permitting (England and Wales) Regulations 2016.

Ref. 15.3 Waste (England and Wales) Regulations 2011.

Ref. 15.4 Department of Energy and Climate Change (2011). Overarching National Policy Statement for Energy (EN-1).
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Ref. 15.5 South West Wales Regional Waste Group (2008). South West Wales Regional Waste Plan. 1st Review.
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Ref. 15.6 Welsh Government (2014) Technical Advice Note 21: Waste. [Online]
Available at: http://gov.wales/docs/desh/publications/170223technical-advice-note-21-en.pdf [Accessed 22/11/2017]

Ref. 15.7 Welsh Assembly Government (2010) Towards Zero Waste – One Wales: One Planet. Available at:
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http://gov.wales/docs/desh/publications/150724-towards-zero-waste-progress-report-en.pdf [Access 22/11/2017]

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Ref. 15.10 Department of Energy and Climate Change (2011). National Policy Statement for Electricity Networks Infrastructure (EN-5),
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Ref. 15.13 Directive 2010/75/EU. Industrial Emissions Directive. (2010). L 334/17.

Ref. 15.14 European Commission (2017) Best Available Techniques (BAT) Reference Document for Large Combustion Plants

Ref. 15.16 BS4142:2014 Methods for Rating and Assessing Industrial and Commercial Sound.