3 Description of Development

Introduction

3.1 This chapter provides a description of the project and forms the basis for the environmental assessment.

3.2 The effects of the project have been assessed throughout the ES based on what is likely. For example, construction information is presented as the 'likely case'. A number of measures which would reduce or avoid adverse environmental effects arising have been included as part of the project design. Details of these measures are provided in this chapter. The data required to identify and assess the main and likely significant effects which the project may have on the environment have been provided.

Key Characteristics of the Project

3.3 The applicants (Brunner Mond and E.ON Energy from Waste UK Limited) propose to develop a Sustainable Energy Plant (SEP) on the site of the former power station on the existing Brunner Mond site at Lostock. The proposed SEP would have a total gross maximum electricity capacity of up to 60 MWe gross (53 MWe net) and would be capable of producing approximately 100 tonnes of steam per hour directly to Brunner Mond. The SEP would consume approximately 600,000 tonnes of pre-treated waste derived fuel per annum (tpa). The plant would improve the overall sustainability of energy use by Brunner Mond, providing approximately one third of the required heat energy at the site and therefore displacing a significant quantity of fossil fuel.

Application Site

3.4 The application site, as shown in Figure 1.1, occupies an area of approximately 9.2 ha. This includes the following components:

- Main SEP site, including Ash Handling Facility and Rail Reception Facility: 6.4 ha;
- Construction laydown area for main site: 1.9 ha;
- Relocated coke store: 0.9 ha.

3.5 The main SEP site comprises an area of approximately 6.4 ha on the site of the former Lostock Power Station site (now redundant). The site is bounded to the east by the Trent and Mersey Canal and to the north by the adjoining Brunner Mond chemical works and the brine purification plant owned by Ineos. The main site includes land to the west of the SEP which would provide an Ash Handling Facility and the Rail Reception Facility for the waste derived fuel. This area is currently occupied by the existing rail connection for the site and a coke store.

3.6 In addition to the SEP site, an area of approximately 0.9 ha of land to the north of the site is included in the red line boundary for the project. This land is required to provide a relocated coke store for the existing Brunner Mond facility.

3.7 A further 1.9ha of land to the east of the SEP site has been identified for temporary use as a construction laydown area.

Fuel

3.8 The SEP would consume approximately 600,000 tonnes of pre-treated waste derived fuel per annum (tpa). The waste sources would include pre-treated Municipal Solid Waste (MSW), Commercial and Industrial Waste (C&I) and Solid Recovered Fuel (SRF). Treated municipal waste, such as MSW and RDF, is the product of the processing of raw municipal waste by, for example, mechanical and biological treatment (MBT). MBT facilities do not form part of the project subject to the current application.

3.9 The market prior to the operation of the SEP would determine the source of the waste derived fuel. For the purposes of this assessment and to understand effects on the local road network it has been assumed that the fuel will come from North West England, the North Midlands and Wales as indicated in Table 3.1 below.

Table 3.1: Fuel Sources and Vehicle Movements

Source of Waste	Estimated %	Route to/from Site
North Wales	35%	M6 North
North West of England	35%	A556 East
North Midlands	30%	M6 South
Total	**100%**	

3.10 However, it is noted that if a suitable source of waste derived fuel were available more locally (for example at the adjacent proposed Viridor site), the Lostock SEP could accept such fuel.

3.11 In addition, the applicants may wish to use the facility to burn other non-hazardous materials, such as biomass, subject to the approval of the Environment Agency and grant of the necessary Environmental Permit.

Built Development

3.12 Figures 3.1a to 3.1c provide layout plans for the SEP and for the Ash Handling Facility. The dimensions of key buildings/structures are set out in the Table 3.2 below.

Table 3.2: SEP Building Dimensions

Building	Height (m AOD)	Length (m)	Width (m)
Fuel Reception Hall	17	39	45
Fuel Storage Building	36	32	54
Boiler House and Switchgear Building	48	51	45
Flue Gas Treatment Building	43	56	35
Steam Turbine	24	35	22
Air Cooled Condenser	22	131	12

3.13 In addition to the buildings, the SEP would require two co-located emissions stacks, at a height of 90 m.

3.14 The Ash Handling Facility would be located to the south west of the main SEP site adjacent to the rail connection. This building would be approximately 46 x 89 m with a height of up to 22 m.

3.15 Elevation plans of the building components proposed for the SEP and Ash Handling Facility are provided at Figure 3.3.

3.16 In addition to the SEP and Ash Handling Facility, the following associated infrastructure would be provided as part of the project:

- On-site pipelines for the collection and distribution of steam;
- Ancillary development including internal roads, parking, gatehouse weighbridge, rail connection, water treatment, fuel store, fencing, landscaping and offices;
- Grid connection for electricity export, including transformer and an indicative cable route to the existing substation at Hartford;
- Relocated coke store (relocating the existing coke store currently adjacent to the rail connection to an area to the north of the SEP site).

3.17 It is noted that whilst the application for a grid connection for the SEP forms a separate consenting process, the connection is considered to form part of the project. Therefore, an indicative cable route (shown on Figure 3.2) is described in this chapter and has been assessed within the ES.

Process Elements

3.18 The principal stages in the operation of the project are described below. A flow diagram of the SEP process is provided at Figure 3.4.

3.19 The SEP would utilise proven and tested technology and has been designed to process pre-treated waste derived fuel, from which all economically viable recoverable materials have been removed. This residual fraction would otherwise go to landfill.

3.20 The SEP process equipment would be wholly enclosed within buildings. The ash handling facility would be separate but also fully enclosed within a building.

Fuel Reception and Storage

3.21 Based on current information on the likely transport modes to be used by local authorities/suppliers of pre-treated waste derived fuel, it is anticipated that such fuel would arrive at the SEP by both rail and road. The fuel reception facility would operate on a 24 hour basis.

3.22 The fuel would be delivered to the plant in enclosed containers or sealed vehicles. The loads would be weighed upon entry to the site, by weighbridge for road vehicles or, in the case of rail containers, by onboard weighing technology fitted to the transit vehicles.

3.23 Deliveries made by road would access the site via the Lostock Site access road and weighbridge and such vehicles would transport the fuel to the reception hall/fuel unloading area of the main SEP building using the dedicated access roads within the site.

3.24 Deliveries by rail would use the existing rail connection for the Lostock Site and are assumed to be in containers on flat bed rail trucks. The containers would be unloaded into the adjacent container laydown area using a crane. Containers would then be transported within the site to the reception hall/fuel unloading area of the main SEP building.

3.25 The fuel unloading area would be an enclosed building within which the containers and lorries would discharge their contents into the fuel bunkers. Access to and from this area would be via entrances fitted with fast acting doors which would remain closed unless containerised vehicles are entering or exiting the hall. The floor area within the hall would be periodically washed down to ensure clean operation.

3.26 The fuel bunkers would be accessed via seven gates which would be controlled by the crane driver or by a member of staff in the reception hall/unloading area to ensure that they only open when discharge from a container is to take place. The bunker arrangement would have a depth of 7 metres below the general floor level of the plant. Within the bunkers the fuel would be mixed to provide for a regular quality.

3.27 The fuel bunker and unloading hall would be ventilated under negative pressure. During normal operation, the exhaust air would be fed into the combustion system. During downtime the extracted air would be ventilated through a separate activated charcoal or similar filter and discharged through a vent pipe on the roof of the bunker.

3.28 From the bunkers, fuel would be fed to the charging hoppers which in turn feed the grate stoker furnace located within the boiler house.

3.29 Operators would monitor the fuel flow via an automated weighing system and Closed Circuit Television system in the control room.

Boilers

3.30 The SEP would comprise two individual but identical process lines fed from the common fuel bunkers. Each line would consist of a combustion zone, heat recovery zone, and flue gas treatment area before the cleaned gasses are released to the atmosphere via one of two emission stacks.

3.31 It is assumed that each process line would have approximately 90% availability as a result of planned and unplanned downtime. A two line plant provides operational flexibility during periods of maintenance, enabling one line to be shut down whilst the second continues to operate. Planned down time would be for a period of approximately 3 weeks per line per year.

3.32 Combustion of the fuel would take place in the combustion grate. The charging hopper would pass from the bunkers to an intermediate shaft from where feeders would distribute the fuel over the full width of the boiler and transport it to the burning zone.

3.33 Back up burners fuelled by light fuel oil would be located above the grate. The burners would allow for start up from a cold state and as a supplementary firing means to ensure a minimum operating temperature of 850 ^{o}C in compliance with the Waste Incineration Directive.

3.34 Combustion air would be fed into the furnace through the underside of the grates by a primary air fan. Air would also be injected at high velocity through nozzles positioned in the walls of the combustion chamber above the level of the waste. This would create turbulence, which assists mixing of the secondary air and combustion gases to achieve complete combustion of the gases. The volume of both primary and secondary air would be regulated by an automatic combustion control system.

3.35 The steam generation system would be located above the grate. The steam generating equipment would operate within a pressure of 48 bara and 410^{o}C. This minimises chloride corrosion to the heating surfaces. The pipe walls of the first, second and third exhaust flue as well as those of the horizontal flue would constitute the evaporator heating surfaces, where at first saturated steam would be generated. The horizontal flue would contain the convection heating surfaces suspended in the flue gas flow and super heater and feed water heater (Economiser). The flue gas would be ventilated from the grate via the four passes in to the flue gas treatment system behind the horizontal flue.

3.36 Ash hoppers beneath the grate would discharge residues from the combustion process into the water based slag extractor. The burnt slag at the end of the grate would fall into the water quench via the bottom ash hopper. A conveyor would carry ash and slag out of the water quench. This material would be transported to the slag bunker via a belt or conveyor.

Ash Management

3.37 Bottom ash is the cooled burnt-out residue from the combustion process. Approximately 20% of the fuel burnt is expected to be converted to bottom ash. This would equate to up to 120,000 tonnes per annum of bottom ash.

3.38 The ash would be treated to remove iron, non-ferrous metals and un-burnt fuel. The slag would be crushed into a graded material. Ferrous and non ferrous metals would be recovered and any un-burnt matter returned to the fuel bunker. The ash would be graded and transported by internal road to the on-site enclosed ash handling facility (to the west of the main SEP site) where it would be stored in rows for a period of three months 'ash maturation'. This process enables the bottom ash to hydrate and age, improving its ability to be put to beneficial use for the construction industry. All maturated bottom ash (slag) would be exported from the site.

3.39 Any ash that is not sold for beneficial use off site would be treated as a waste product from the process. Bottom ash, as with other wastes, would be disposed of to a suitably licensed landfill facility and would meet the waste acceptance criteria testing thresholds before being accepted for landfill.

Flue Gas Treatment

3.40 Combustion gases would be subject to treatment before they are released to the atmosphere. A dry flue gas treatment system using sodium bicarbonate for neutralisation of acid gases would be used.

3.41 The dry flue gas treatment system would not generate waste water. The system would consist of the following components:

Sodium bicarbonate injection system, including on-site milling facility (within existing Lostock Site);

- Fabric filter;
- Induced draught fan;
- Emissions stack.

3.42 Fine particles of sodium bicarbonate would be dry injected into the hot flue gases where they would react with acidic components. This would neutralise acid components to below the Waste Incineration Directive limit. The design of the treatment plant would be subject to agreement with the Environment Agency as part of the Environmental Permit process and would be compliant with the EC Waste Incineration Directive.

3.43 The freshly milled sodium bicarbonate would be dry injected into hot flue gases where it would decompose to create a high surface area sodium carbonate which reacts quickly and efficiently with the acid component of the gas. Activated charcoal would also be introduced to the flue gas to separate heavy metals and dioxins and furans by adsorption.

3.44 The flue gas from the grate would be denitrified by a process which converts nitrogen oxides (NO_X) produced during combustion into nitrogen and steam by non catalytic conversion. The reducing agent used would be ammonium hydroxide, which would react with nitrogen dioxide in the flue gases within a temperature range of 850 - 950^{o}C. It is anticipated that approximately 30,000 tonnes of fly ash and flue gas treatment residues would be produced per annum.

3.45 The fly ash and flue gas treatment residues would be captured in fabric filters downstream in the process, with the filter bags regularly cleaned. The residues would be transported by conveyors to the residue silo. Once collected, the ash would be loaded into sealed containerised vehicles and transported from the site for disposal within a permitted facility.

3.46 Clean exhaust gas would be directed to the emissions stack by an induced draft fan. An exhaust silencer would control sound emissions at the stack outlet.

Emissions Stack

3.47 Each of the two processing lines would be served by a stack with a height of approximately 90 metres located at the southern end of the building. The two stacks would be co-located and would therefore appear as a single structure in more distant views.

3.48 The stack height has been determined through extensive dispersion modelling of emissions and evaluation of the resulting dispersion plumes in order to ensure that ground level concentrations of key pollutants would be maintained within acceptable levels under all operating conditions.

3.49 The air quality modelling used to identify the stack height necessary for optimum dispersion is described in detail in Chapter 7 and Appendix 7.1 of this ES.

Energy Recovery

3.50 About half (100 tonnes) of the high pressure steam generated would be extracted from an intermediate stage of the steam turbine as intermediate pressure steam at 13.5 bara and 250^{o}C. The remainder of the high pressure steam would pass through the turbine to condensing conditions, generating electricity through a turbine driven alternator. The 100 tonnes of extracted intermediate pressure steam would be further let down through a back pressure turbine to low pressure (2.5 bara and 125-130^{o}C) to meet Brunner Mond's needs and generating additional electricity in the process.

Power Output

3.51 The proposed SEP would have a total gross maximum electricity capacity of up to 60 MWe gross and would be capable of producing approximately 100 tonnes of steam per hour directly to Brunner Mond.

3.52 The electrical energy would be generated at a voltage of 10.5kV. This would be transformed to a voltage distribution of 400V and to 700V to supply the plant itself. Electrical power exported from the SEP would be fed to the grid at 132kV via a transformer.

3.53 At the current time, the grid connection point is yet to be confirmed. Discussions with Scottish Power have confirmed that the grid connection would be via underground cables connecting to the local Scottish Power network in the vicinity of the Lostock Site. For the purposes of the ES, an indicative grid connection route has been assessed as shown on Figure 3.2. This would provide a connection route alongside the A350 and beneath the cycle path adjacent to the A556 to the existing Hartford substation. This represents a worst case scenario. Alternative connection points have been discussed with Scottish Power and it may be feasible to connect considerably closer to the site (and therefore with reduced environmental impact).

Other Materials Used and Stored on Site

3.54 A range of chemical substances and hazardous materials would be stored on site associated with the SEP process including ammonia water (25%), Briskarb® (sodium bicarbonate) and activated carbon, boiler water treatment chemicals, low sulphur fuel oil, nitrogen, oxygen and acetylene bottles. These materials would be stored in accordance with Environment Agency guidance.

3.55 The reagent chemicals would be stored in suitable storage tanks located within the building infrastructure (stored in the concrete building within the boiler house). Briskarb®- (sodium bicarbonate) and activated carbon would be used within the flue gas treatment process. Storage would be in dedicated steel silos with equipment for filling from a tanker through a sealed pipe work system. Delivery to the SEP would be by bulk powder tanker. Briskarb® is manufactured on the Lostock Site and would therefore be delivered by internal transfer.

3.56 Boiler feed water would be supplied from the Winnington Combined Heat and Power plant and there would therefore be no need for on site treatment for boiler feed water. However, the existing water purification plant, used to generate process hot water for \Brunner Mond, would be displaced by this project. The project therefore includes a replacement and relocated hot purified water plant. Fuel oil would be used on site for the auxiliary support burners and diesel fuel for mobile plant and equipment. The fuel oil would be stored within a bunded storage tank and the diesel tank would be located underground. Portable bottles of oxygen and acetylene gas would be stored on site for welding purposes gas bottles would be kept secure.

Water Usage, Treatment and Disposal

3.57 The SEP would be designed as a net consumer of water and therefore there is no requirement for regular disposal of any waste water from the combustion process. However, waste waters could be created from the process in the following areas:

- Water from the boiler drains;
- Wash down water from surface cleaning;
- Surface water on potentially contaminated areas (roads and hardstanding);
- Leachate from the bottom ash storage area.

3.58 Where possible, water from the plant would be recycled for re-use in either the SEP or in the Brunner Mond processes. Contaminated or unusable water would be directed to an existing appropriately authorised effluent treatment facility on the Lostock Site.

Operation of the SEP

Hours of Operation

3.59 The SEP would produce heat and power 24 hours a day, 7 days a week. It would therefore operate continuously throughout the year except during shutdowns for maintenance.

3.60 It is assumed that each line would have approximately 90% availability as a result of planned and unplanned downtime. A two line plant provides operational flexibility during periods of maintenance, enabling one line to be shut down whilst the second continues to operate. Down time would be for a period of approximately 3 weeks per line per year.

3.61 Deliveries of fuel to the site would be scheduled to match available routings and the needs of the fuel suppliers (i.e. waste processing plants). It is anticipated that the majority of fuel would be delivered between Monday and Saturday. A small amount of waste may be delivered on Sundays. The incoming fuel would be stored in containers (for rail deliveries) and in the fuel bunkers to supply the plant during the night and over the weekend and bank holidays.

Site Staff

3.62 The SEP would employ approximately 50 full time employees comprising operator shift staff, maintenance employees, weighbridge operators, clerical and administrative staff and plant management.

3.63 The balance between office and plant workers and shift patterns have yet to be precisely determined. However, for the purposes of the ES it is assumed that the plant would have 4 shift teams. Each day there would be 3 shifts, operating from 7am to 3pm, 3pm to 11pm and 11pm to 7am. It is assumed that eight of the 50 employees would be office staff working a typical 0900 – 1700 shift with the remainder covering four shifts with one of these shifts being a rest day.

3.64 In addition, an average of 100 contractors would be employed for planned shutdowns.

Lighting

3.65 The plant would operate on a 24 hour basis. Site lighting would be selected and positioned in order to minimise light pollution and energy use but also to ensure good working conditions and safety for personnel and security. Internal roads and walkways would be lit in accordance with normal standards and in accordance with practice elsewhere on the Lostock Site. Areas of external equipment would be illuminated with specific and directional task-based lighting as would the gantry cranes and rail container loading and unloading area. Access routes and high level walkways within these would also require illumination. The rail sidings would be illuminated with appropriate low level lighting to allow safe working during hours of darkness and minimise the impact outside the site boundary.

Landscape Scheme

3.66 Landscape proposals have been designed as an integral part of the project to provide treatments for the perimeter and internal green spaces. The design has evolved with reference to key landscape features and qualities found within the surrounding landscape.

3.67 The objective of the landscape proposals is to provide a scheme that is:

- Uncluttered to allow easy access and flow around the site;
- Integrated into the landscape and townscape in views from receptors particularly from the immediate vicinity;
- Provides an attractive working environment for employees that is practical and fit for purpose.

3.68 Landscape proposals would complement the entrance to the Lostock Site bringing the surrounding rural landscape into the area.

3.69 The perimeter landscape treatments to the south eastern boundaries would work in conjunction with the attenuation feature below the air cooled condensers which run parallel to the development and the canal. Marginal wet grassland would be established on the gently sloping sides of this area.

3.70 Internal green spaces within the site would receive a simple treatment of grassland and wildflower meadow with a network of mown paths. Seating areas would be defined and shaded by clusters of trees on the exposed sides of the building.

3.71 The proposals seek to reflect the character of Lostock and the surrounding landscape, establishing vegetation types using native species which would provide a transition in the landscape to connect the areas different features and characteristics.

3.72 Further details are provided in Chapter 8 and at Figure 8.21.

Traffic

3.73 The site is accessed via Griffith's Road (the A530) which connects directly to the M6 south at Junction 18 and to M6 North (Junction 19) and the M56/M60 via the A556. However, traffic from the A559 to the north is restricted due to the low bridge under the railway.

3.74 A main line standard rail connection to the site already exists and is used for a daily delivery of limestone by rail from Buxton.

3.75 During operation, traffic would arise from the following activities:

- Delivery of fuel;
- Import of materials for the flue gas treatment chemicals (although it should be noted that the majority of such chemicals are manufactured on site and would be provided via on site transfer);
- Export of residues from the flue gas treatment process;
- Export of fuel not meeting plant specifications;
- Deliveries of materials in support of the day-to-day operation of the plant (e.g. spares, office consumables);
- Employee vehicles.

Fuel Deliveries: Likely Scenario

3.76 It is anticipated the most likely scenario for fuel deliveries to the site would be approximately two thirds of fuel delivered by rail and the remaining one third by road.

3.77 Based on E.ON Energy from Waste UK Ltd's experience, preliminary research and given their already established working relationships with several industry partners including Network Rail and the principal Freight Operating Companies, it is considered that a two thirds rail scenario is deliverable.

3.78 This scenario equates to 400,000 tonnes per annum (tpa) imported by rail and 200,000 tpa by road. The resultant trip generation for this likely scenario is set out below.

Import of Fuel by Rail

- Annual import of fuel: 400,000 tonnes;

- Average container load of 15 tonnes;
- Assuming 57 containers per train;
- 286 days of operational deliveries per year; and
- Equates to 1-2 trains per day.

Import of Fuel by Road

- Annual import of waste: 200,000 tonnes;
- Average HGV load of 20 tonnes;
- 286 days of operational deliveries per year; and
- Equates to 35 deliveries per day by road or 70 two-way trips per day.

Export of Bottom Ash (assuming exported by road as a worst case)

- Annual export of ash/ aggregate: 120,000 tonnes;
- Average HGV load of 20 tonnes;
- 286 days of operational deliveries per year;
- 420 tonnes per day;
- Average HGV load of 20 tonnes; and
- Equates to 21 deliveries per day by road or 42 two-way trips per day.

Other Export Waste (assuming exported by road as a worst case)

- 4 tankers a day of Fly Ash and Flue Gas Treatment Residues; and
- 1 tanker every 2-3 days day of ammonia solution.
- Equates to up to 5 deliveries per day by road or up to 10 two-way trips per day (as a worst case).

3.79 On the basis of the above, fuel deliveries and export of waste products would equate to approximately 122 two-way HGV movements per day and 2 rail movements.

Fuel Deliveries: Worst Case Scenario

3.80 For the purposes of the assessment, a worst case scenario has also been modelled to consider the effects of all fuel imported by road. This is very much a worst case as it is likely that the majority of fuel would be transported by rail as set out above.

Import of Fuel by Road

- Maximum annual import of fuel: 600,000 tonnes;
- Average container load of 20 tonnes;
- 286 days of operational deliveries per year;
- Amounts to 2,098 tonnes per day; and
- Equates to 105 deliveries per day by road or 210 two-way trips per day.

3.81 Based on the same calculations for export waste used within the likely scenario, the trips generated by the site as a worst case would equate to approximately 262 two-way HGV movements per day.

Summary of Proposed Development Vehicle Generation

3.82 Table 3.3 summarises the peak hour and daily vehicle trip generation for the project in both the likely and worst case scenarios.

Table 3.3: Proposed Development Staff Vehicle and HGV Movements

Scenario	Vehicle Type	AM Peak Period			PM Peak Period			24 hour		
		Arrive	Depart	Total	Arrive	Depart	Total	Arrive	Depart	Total
Likely	Staff Cars	8	0	8	0	8	8	40	40	80
	HGVs	5	5	10	5	5	10	60*	60*	120*
Worst Case	Staff Cars	8	0	8	0	8	8	40	40	80
	HGVs	11	11	22	11	11	22	132*	132*	264*

*differences due to rounding

3.83 As can be seen there would be 18 two-way movements during each peak period in the likely scenario and 30 two-way movements in each peak in the worst case scenario. Over a daily period the proposed development is likely to generate 200 two-way vehicle movements and 344 two-way vehicle movements as a worst case.

Approach to Construction

3.84 The main focus for construction work for the project would be within the main SEP site. During construction, an additional area of land to the east of the main site and canal (between Griffiths Road and the canal) would be utilised as a construction laydown area and for temporary construction facilities. In addition, construction works would be required for the grid connection.

Construction Programme

3.85 The following timescale is anticipated:

- Construction, including demolition of the former Lostock Power Station, commencement: Q4 2011;
- Construction completion: Q1, 2015;
- Commissioning: Q2, 2015;
- Operation: Q3, 2015.

3.86 The first stage in the construction works would be the relocation of the existing coke store and of the existing Brunner Mond buildings and pipebridges on site. Construction of the facilities on the main site is anticipated to take approximately 3.5 years. These works would comprise demolition, civils and plant erection.

3.87 There would be two main periods of construction works which would overlap to some degree. These are the civil engineering works associated with the plant construction and the process work involved in the mechanical and electrical equipment installation, fit out and commissioning of the plant. The estimated peak period of overlap would be for 4 months during 2013. The commissioning stage would commence as the construction phase nears completion. It is expected that each stream would be brought into use in sequence. In practice, some waste would be taken during the commissioning period on an intermittent basis.

3.88 For the purpose of the EIA, 2015 has been assumed as the commencement date for fuel imports to the site.

Construction Working Hours

3.89 Construction operations would generally take place between the following hours:

- 07:00 – 18:00 Monday to Friday
- 07:00 – 13:00 Saturday

3.90 Intrusive work outside of these hours would be by prior agreement of the Local Planning Authority, except in the case of any emergency. However, it is envisaged that non-intrusive activities (such as electrical installations, plumbing and similar activities) would be undertaken outside of these hours in order to minimise overall construction time. HGV movements associated with such activities would be insignificant.

Plant

3.91 Plant to be used during the construction phase would typically include:

- Tracked Excavators (Excavation and loading)
- Articulated Dump Trucks
- Wheeled Back Hoe Loaders
- Wagons
- Telescopic handlers
- Rollers
- Water Pumps
- Concrete pump
- Generators
- Cement Mixer Truck
- Cranes
- Piling Rig(s)

Construction Activities

3.92 The construction works would comprise the following main activities:

- Demolition, site clearance and enabling works;
- Civil works;
- Plant erection;
- Commissioning.

Demolition, Site Clearance and Enabling Works

3.93 The existing buildings on the main site would be demolished and the area would be cleared of foundations, underground obstructions including service relocations. The existing buildings include the former Lostock Power Station and conventional demolition techniques would be adopted, including the use of concrete breakers and crushing/regarding equipment. The demolition of the existing power station is already permitted as part of a planning condition for the new CHP plant. The existing coke store would be transferred to a new location within the Lostock Site. Any topsoil and hardcore materials would be removed and stored for re-use on the application site where practicable.

Civil Works

3.94 The main site is generally flat and a substantial site levelling exercise is not envisaged. However, there would be excavations for some of the foundations, including the bunker and stack. A cut and fill exercise would be carried out to ensure that as far as practicable removal of surplus fill material is minimised and that an approximate cut and fill balance is achieved. Main site roadways and drainage systems would be installed at an early stage. Construction of the access road would be a priority in order to provide a suitable route into the site for construction traffic at the earliest opportunity. Due to the historic use of the site, it is envisaged that a limited quantity of contaminated material may be encountered and this would require treatment and/or disposal to a suitably licensed facility. Structures on the main site would require appropriate foundation design. Some piling is likely to be required and may include the use of continuous flight auger piles and driven sheet piles to support deep foundations. A key element of the civil works phase would be the construction of the reinforced concrete bunker. It is likely that the bunker would be of slip-form construction and as such would involve pouring of concrete on a 24 hour basis.

3.95 Steel framed structures such as the boiler house, tipping hall and turbine hall would be erected at a time to match the equipment erection.

Plant Erection

3.96 The key element within this phase would be the erection of the boiler plant. As far as practicable, the boilers would be brought to site in large modules and erected using either fixed or mobile cranes. Other main plant items include the fuel feed systems, flue gas treatment facilities, the flue gas pipework and stack, steam turbines and cooling towers. These items would also be modularised as far as possible to reduce the amount of work on the main site. Following the erection of the main plant items, connecting pipework, conveyors and cabling would be installed followed by the control systems.

Site Finishes

3.97 Where possible, some planting would be put in place early in the construction phase following site clearance.

Temporary Services

3.98 Temporary supplies of electrical power and water would be required for domestic and construction purposes. Domestic effluent would be disposed of by tanker. Where necessary, surface water would be collected and treated prior to discharge into the existing drains.

Environmental Measures Forming Part of the Project

3.99 Measures adopted as part of the project in order to minimise or reduce its environmental effects are summarised in Tables 3.4 and 3.5 below. Additionally, a number of topic assessments make recommendations for Further Mitigation Measures over and above the proposed scheme and these are set out in the topic chapters as appropriate.

3.100 A Construction Environmental Management Plan (CEMP) would be prepared before the construction phase of the project to ensure that best practice is employed. The CEMP would, amongst other matters, include method statements to address the risk of contaminated land, for the proposed development itself and a pollution control and contingency plan. The CEMP would include a range of specific measures, including those set out in Table 3.4 below.

Table 3.4: Measures Adopted to Reduce or Avoid Adverse Environmental Effects: Construction Phase

Schedule of Design Measures to Reduce or Avoid Adverse Environmental Effects
Traffic
Construction operations would generally take place between 07.00 and 18.00 Monday to Friday and 07.00 and 13.00 Saturday. No construction works would take place on Sundays or Public Holidays. Intrusive work outside of these hours would be by prior agreement of the Local Planning Authority, except in the case of any emergency.
Construction working hours would allow traffic to avoid peak traffic periods. All contractors would be encouraged to adopt green travel policies, such as car sharing or the use of mini buses.
Construction heavy goods vehicles would access the site using existing established routes from the motorway and A road network.
Air Quality
The London Best Practice Guide provides best practice mitigation and monitoring measures for dust at construction sites. A range of measures would be adopted for the project site as set out in Chapter 7, including measures associated with demolition works, site planning/activities and construction traffic.
Landscape and Visual Effects
Construction site lighting would be selected and positioned in order to minimise light pollution and energy use, but also to ensure good working conditions, safety to personnel and worksite security.
All works on site near trees to be retained would be to British Standard BS 5837: 2005 (Trees in Relation to Construction - Recommendations) and managed during the construction period to ensure they remain safe i.e. tree protective fencing to BS 5837: 2005 specifications.
Ecology and Nature Conservation
Where required, further species surveys would be undertaken prior to construction as set out in Chapter 9. Where protected species are present, these would be protected during construction and protected species licenses would be obtained if required. Further details are provided in Chapter 9.
In order to avoid conflict with nesting birds all vegetation clearance and building demolition would be undertaken outside of the bird-nesting season where practicable (mid February to mid September inclusive). If this is not possible, an ecologist would resurvey the areas to be removed / demolished and advise if nesting birds are present. If active nests are recorded, no vegetation clearance or building demolition would proceed until the young have left the nest.
Works would be undertaken following standard good practice guidelines to minimise disturbance. Appropriate mitigation measures would be incorporated such as siting construction compounds away from more sensitive areas along the grid connection route.
Any of the wood from trees felled would be retained on site and hibernacula created in suitable locations to benefit herpetofauna.

Schedule of Design Measures to Reduce or Avoid Adverse Environmental Effects
Hydrology
The CEMP will include best practice measures in relation to hydrology and pollution control and will include method statements for the proposed development and a pollution control and contingency plan. The CEMP will draw on the CIRIA document “Control of Water Pollution from Construction Sites” and the Environment Agency Pollution Prevention Guidelines to ensure protection of water resources including the nearby canal. A range of specific measures are set out in Chapter 10.
Ground Conditions
All fuel and chemical storage would be in accordance with the Environment Agency Pollution Prevention Guidelines and would be in bunded areas with an impermeable base, capable of providing at least 110% capacity of the storage tank.
Brunner Mond has procedures in place to respond to spillages both on and off Lostock Site. In addition, a project Spillage Response Plan would be developed for the construction of the SEP. It would set out systems to ensure that pollution effects upon people, flora, fauna, land, air and water are contained and minimised and that clean-up procedures and spill kits are in place to respond effectively in the event of an incident.
It is proposed that as far as practicable, the project would achieve an approximate cut/fill balance. However, where any excess material is required to be removed from the site, efforts would be made to identify a potential local opportunity for beneficial re-use of these materials, such as other construction projects in the area at the time. Disposal to landfill would be regarded as the final option.
Noise and Vibration
The CEMP will include details of measures to be undertaken to minimise the effects of construction noise and vibration in accordance with Best Practicable Means (BPM). Descriptions of measures that may be employed are provided within BS 5228-1 and include selection of appropriate plant and community liaison.
Social and Economic Effects
The CEMP would encourage contractors to make use of the local workforce wherever possible.

Table 3.5: Measures Adopted to Reduce or Avoid Adverse Environmental Effects: Operation and Design

Schedule of Design Measures to Reduce or Avoid Adverse Environmental Effects
Traffic
The use of the rail network for fuel deliveries would be encouraged. It is considered likely that approximately two thirds of fuel would be delivered by rail.
Air Quality
The stack height has been selected for the optimum dispersion of pollutants has been determined to be 90 m, based on the findings of the stack height determination presented in Air Quality Appendix 7.1.
Landscape
Landscape proposals have been designed as an integral part of the project to provide treatments for the perimeter and internal green spaces. The design has evolved with reference to key landscape features and qualities found within the surrounding landscape. Details are provided in Chapter 8.

Schedule of Design Measures to Reduce or Avoid Adverse Environmental Effects
Ecology and Nature Conservation
Bird and bat boxes would be incorporated into the development. The boxes would be erected in the retained mature trees on site and buildings in suitable areas i.e. unlit for bats. Peregrine falcons were identified immediately off site during the desk study consultation and recorded nesting on site during the extended Phase 1 Habitat Survey in 2010. A peregrine falcon platform would be provided as part of this mitigation. Bat bricks, ridge vents and tiles would also be incorporated into new buildings on site, where appropriate.
The project includes some landscape planting and measures for habitat creation and compensation as described in Chapters 8 and 9.
Detailed lighting specifications would be reviewed prior to installation with an ecologist to make sure they meet the needs of the variety of wildlife using the application site. Lighting would be sensitively designed to take into account the species of bats utilising the site.
Hydrology
A new dedicated drainage system would be included, incorporating pollution prevention measures to meet current requirements. The drainage system will have a long-term management plan for its upkeep, maintenance and operation.
The drainage scheme would include the provision of surface water attenuation storage on site where necessary.
The site would be operated under an Environmental Permit which would have conditions pertaining to surface water quality limits.
A management plan would be developed for the operation of the site, for control and prevention of pollution and an action plan identified should leakage or spillage occur.
Ground Conditions
Although not underlain by an important groundwater resource, measures would be adopted during the design and construction phases of the project to ensure the design of foundations would minimise the risk of pollution during construction.
Additional contamination investigations would be required once the detailed design of the facility is complete and it is envisaged that the scope of such investigations and reporting of the findings would be undertaken as a condition of planning consent to allow the Local Authority Contaminated Land Officer and Environment Agency the opportunity to review and comment ahead of any works being undertaken in order to minimise any risks to the environment.
Where areas of contamination are confirmed, excavation would be avoided where feasible within the design. However, where such avoidance is not possible, impacted materials will be re-used on site where possible or the options for on-site treatment of contaminated soils considered and/or disposal to a suitably licensed facility. Details of measures to be taken to protect personnel and the environment are provided in Chapter 11.
Noise and Vibration
Although the SEP would be operational on a 24 hour basis, the majority of fuel deliveries would occur during the daytime. This would reduce noise emissions from the operational facility during the night-time.
Delivery HGVs would manoeuvre within an enclosed area attached to the tipping hall. This would reduce the noise emissions from the operational facility and, in particular, the noise from HGV reversing signals.