Widnes 3MG Biomass Combined Heat & Power (CHP) Plant

Widnes, Halton

Burmeister and Wain Scandinavian Contractor A/S (BWSC)

Environmental Statement
Chapter 4
Development Proposals
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Chapter 4 Appendices (See Volume 2)

There are no associated Appendices
4 Development Proposals

4.1 Introduction

4.1.1 Under Schedule 4 of the Town and Country Planning (England and Wales) (Environmental Impact Assessment) Regulations 2011 an Environmental Statement should provide a description of the development. This chapter describes the development for which planning permission is sought and sets the basis against which the Environmental Impact Assessment has been conducted.

4.1.2 The development proposals have been formulated following a thorough investigation and assessment of the environmental impacts arising from the scheme.

4.1.3 In summary, permission is sought for the development of a renewable biomass Combined Heat and Power (CHP) plant fuelled by virgin and recycled wood (“wood fuel”). The development is located within the Mersey Multi Modal Gateway site (3MG).

4.2 Background to the proposal

4.2.1 The UK Government has a target of securing 15% of the UK’s energy consumption from renewable sources by 2020. As set out in the Renewable Energy Road Map (Dept for Energy and Climate Change) 2011, biomass used for electricity and heat generation is seen as one of the key technologies capable of delivering this target. The government considers that bio-energy could deliver around half of the total generation needed to meet our 2020 renewable target.

4.2.2 The Climate Change Act established a legally binding target to reduce the UK’s greenhouse gas emissions by at least 34% by 2020 and 50% by 2027.

4.2.3 Local policy both in the adopted Halton Unitary Development Plan (UDP) and emerging Halton Core Strategy are both supportive of renewable CHP schemes to assist with reducing CO2 emissions.

4.2.4 The combined production of heat and electricity through CHP improves energy efficiency helping to reduce CO2 emissions further and utilises heat which would otherwise be discharged to the atmosphere.

4.2.5 The Biomass CHP plant will therefore make an important contribution towards renewable energy and CO2 emission reduction targets. It is ideally placed to integrate with the wider 3MG/Stobart Park development, with the potential to provide heat to existing and proposed future heat consumers as well as receive fuel it needs to produce the heat and power by road or rail network.

4.3 Summary of Operations

4.3.1 The proposed development is for a biomass Combined Heat and Power Plant which will generate renewable electricity and heat by combustion of wood fuel. The annual throughput of the facility would be approximately 147,000 tonnes per annum for a plant that will produce about 20MW of net electrical output. Work is progressing to determine the most efficient and reliable boilers which are available. This may result in some changes to the final annual throughput and electrical output. It is also proposed to supply heat to nearby businesses.
**Fuel Source and Throughput**

4.3.2 The plant will use virgin and recycled wood as a fuel source to generate energy. Utilising wood in this way provides a carbon neutral substitute for fossil fuels. Wood combustion does not contribute to global warming or the greenhouse effect as it only returns to the atmosphere the CO2 that has been taken from it by growing trees. In addition, recovering energy from wood which would otherwise be landfilled avoids methane emissions that would be generated from its decay in landfill and therefore results in significant savings in greenhouse gas emissions. This provides additional sustainability benefits over using other types of biomass.

4.3.3 The proposed scheme is a biomass CHP and not a Energy from Waste plant. This is evidenced from the definition of biomass as compared to EFW within the Renewables Obligations Order 2009 (ROO). The Renewables Obligation is designed to encourage electricity generation from eligible renewable sources in the UK. Suppliers can meet this obligation by presenting evidence of sourcing from renewable generators, known as Renewable Obligation Certificates (ROCs). Under the ROO the proposed wood fuel is classed as biomass as it has at least 90% of its energy content derived from plant matter, i.e. recycled wood.

4.3.4 The Wood Recyclers Association (WRA) categorise various grades of recovered wood based on their quality and this forms the starting point for the development of recovered wood standard specifications. Based on this classification the plant will be able to take the following types of recycled wood fuel:

- Grade A: Clean recycled wood - material produced from cuttings, shavings from solid wood in a natural state and pallets and secondary manufacturing;
- Grade B: Industrial feedstock grade - Grade A material plus material from construction and demolition waste; and
- Grade C: Fuel grade – All of the above material plus that from municipal collections and civic amenity sites. This material includes kitchen refurbishments, discarded furniture and other wooden fixtures and fittings. It can include chipboard and MDF.

4.3.5 The plant will not receive Grade D; hazardous waste e.g. treated fencing or railway sleepers.

**Process Description**

4.3.6 Thermal Processing of materials such as biomass involves its conversion into gases, liquids and solids with the associated release of thermal energy. Thermal processes are generally categorized on the basis of their oxygen requirements (irrespective of whether the oxygen is supplied in air, steam, or as pure oxygen).

*Stoichiometric Combustion*

4.3.7 Combustion with the exact amount of oxygen needed for complete combustion, i.e. the complete reaction of all the organic material (hydrocarbons), is “stoichiometric combustion”. In practice, this never takes place. Combustion with more oxygen present than is needed for stoichiometric combustion is “excess air combustion”. As all combustion systems in practice need excess oxygen, this is what is meant when the term “combustion” is used. There are many different types of combustion systems that could be applied to the biomass materials to be processed in the Widnes Biomass CHP. These are all defined by the method used to move the material through the combustion unit and how that material is supplied with combustion air. Stoker firing comprises many variants of the technique such as static grate, travelling grate, stepped grate, roller grate and pulsed grate. Other techniques include variants of fluidized bed combustion and rotary kilns, rocking kilns, or plasma arcs. Each has its advantages and disadvantages.

4.3.8 A combustion process is considered to be the most appropriate technology for treating the biomass materials to be processed by the Widnes Biomass CHP. The preferred technology for the solid biomass CHP plant is push stoker firing using a stepped grate for combustion. Stoker firing has been applied to solid fuel combustion for more than a century and offers a high level of control of combustion conditions and the associated environmental performance.
Principal Components of the Solid Biomass CHP plant

4.3.9 The main process steps in the solid biomass combustion system proposed for the solid biomass CHP plant are illustrated schematically in Figure 1.

Figure 4.1 Solid Biomass CHP Process

4.3.10 The proposed solid biomass CHP plant comprises the following principal components:

- Biomass reception, storage and handling. Chipping may also be carried out;
- Primary combustion chamber and directly associated secondary combustion chamber;
- Energy recovery system (steam boiler and associated turbine generator);
- Pollution control system (Particulates, acid gases and oxides of nitrogen);
- Stack;
- Residue storage, handling and (possibly) treatment – (the bottom ash is expected to be utilised locally); and
- Fire detection and protection system including fire water storage tanks

4.3.11 Each section of the process is fully instrumented and is controlled by a local control panel, overseen by a central process control unit situated in the control room.

4.3.12 The contractors supplying the stoker-fired combustion system and its associated energy recovery and power generation systems will be selected on the basis of installation quality, experience and track record, as well as efficiency of production and cost.

4.3.13 The activities to be carried out within the solid biomass CHP plant include:

- Acceptance of chipped or unchipped wood fuel and storage;
- Wood chipping plant;
- Energy recovery via combustion and power generation via steam cycle;
• Abatement of emissions (acid gases, oxides of nitrogen and particulates) to atmosphere; and
• Collection of solid residues arising and transport to an appropriately licensed off site recycling/disposal facility.

4.3.14 The solid biomass CHP plant is designed to process approximately 147,000 tpa of biomass and comprises four main areas within and adjacent to the new building:
• Area for the reception, storage and handling of biomass (internal);
• Main building housing the combustion facility and its ancillary energy recovery and power generation equipment;
• Fluegas filtration plant (external); and
• Air cooled condenser (external).

Electricity and Heat Outputs

4.3.15 The proposed solid biomass CHP plant will incorporate combustion and power generation technology, producing a total of approximately 20MWe net of renewable electricity which will be exported off-site. It is expected that up to 3.5MW(th) of thermal energy will also be available to local industry although discussions are ongoing that may increase the amount of heat used. The use of heat for the local community is also under discussion with the local authority.

4.3.16 Low grade heat could be made available to local industry and, possibly, the local community. The amount of this low grade heat that is used does not necessarily affect the amount of electricity that the biomass CHP plant generates. Discussions are underway with a local business for supply of high grade heat but this will be at the cost of electrical output of the biomass CHP plant.

4.3.17 The planning application includes a heat connection route to PDM’s (Grannox) Rendering Plant to allow for the possible supply of high grade heat.

4.3.18 The Biomass CHP will be connected to the national grid via underground cable which, in turn, will be connected into the existing 33kV underground network owned and operated by SP Manweb. Permission for the grid connection is not sought as part of this application as this will dealt with by SP Manweb either through their permitted development rights or planning application as appropriate.

4.3.19 The application boundary plan JER5336-002 indicates the potential routes for power/heat connection.

Remediation

4.3.20 The application currently comprises contaminated land and will therefore require significant remediation work to be made suitable for development to address contamination on site. Remediation will be in accordance with the remediation approach which is being developed for the expansion of the surrounding Stobart Park/3MG. A remediation strategy has been prepared and submitted with the application (See Appendix 12.1).

4.3.21 The proposed levels following remediation are shown on Figure 4.1 Proposed Isopachyte Layout (Drawing 80962-PC-2200)

4.4 Site Layout, Buildings and Structure

4.4.1 The facility comprises a number of principle buildings and structures. These are shown on Figure 4.2 (Drawing 3424 3424-D2-001-201 Site Layout), Figure 4.3 (Drawing 3424-D2-011-201 Layout elevation - looking N and S ) and Figure 4.4 (3424-D2-012-201 Layout elevation - looking E and W). The approximate dimensions of these are set out in the table below.
Table 4.1 Approximate dimensions of buildings and structures

<table>
<thead>
<tr>
<th>Building</th>
<th>Height (m)</th>
<th>Width (m)</th>
<th>Length (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoppers</td>
<td>3</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>Chipping Plant Building</td>
<td>7</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Weighing and Sampling Station</td>
<td>5</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Reception Wood Chips</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Fuel Store</td>
<td>30</td>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td>Boiler Building</td>
<td>30</td>
<td>22</td>
<td>33</td>
</tr>
<tr>
<td>Filter</td>
<td>19</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>ID Fan &amp; Flue Gas Silencer</td>
<td>3</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Stack</td>
<td>59</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Fly Ash Silo</td>
<td>15</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Bottom Ash</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Turbine Building</td>
<td>17</td>
<td>17</td>
<td>28</td>
</tr>
<tr>
<td>Air Cooled Condenser</td>
<td>17</td>
<td>15</td>
<td>41</td>
</tr>
<tr>
<td>Service/Administration and Control Room Building</td>
<td>17</td>
<td>15</td>
<td>23</td>
</tr>
<tr>
<td>Substation Building</td>
<td>5</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Step up transformer</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Bigbag units</td>
<td>4</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Lime/Activated Carbon</td>
<td>-</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Urea Storage Tank</td>
<td>6</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Demineral Water Tank</td>
<td>6</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Fire/Service Water Tank</td>
<td>8</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Firewater/storm Water pit</td>
<td>-</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Diesel oil tank</td>
<td>6</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Effluent Pit</td>
<td>-</td>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>

**Materials**

4.4.2 The following materials have been proposed:

- Vertical cladding in Goosewing Grey;
- Horizontal cladding in (Goosewing Grey);
- Shutter steel doors powder coated in black;
- Entrance and fire steel doors powder coated in black;
- Aluminium double glazed windows with full glass (tinted) front in similar size as façade modules;
- Steel rain water down pipes and cladding trims powder coated in Wedgewood (Goosewing Grey);
- Roof cladding in black;
- Asphalt roads and brushed concrete Service Yards;
• Concrete footpaths; and,
• Palisade security fence to development.

4.4.3 The use of neutral colours such as white, grey and black seek to integrate the new development into the surrounding environment.

Access

4.4.4 The site will be accessed from a new private access road that also forms part of the planning application for the expansion of Stobart Park/3MG development, which will link with the roundabout to the north west from Desoto Road East and the A533 Queensway. The application site therefore includes part of the proposed access road and roundabout to the west.

4.5 Other Infrastructure Provision

Car parking

4.5.1 The proposed development will include 14 parking spaces for staff and visitors including 2 disabled parking spaces.

Lighting

4.5.2 The lighting design will be based on the use of appropriate lighting to provide safe working conditions in all areas of the site, whilst minimising light pollution and the visual impact on the local environment.

4.5.3 The external lighting scheme will be designed in accordance with Guidance Notes for the Reduction of Light Pollution published by the Institute of Lighting Engineers.

Internal

4.5.4 Within the internal process areas and outside of normal working hours, operators will be in the control room and thus lighting will generally remain switched off with the exception of emergency and escape route lighting. The lighting will be controlled locally and from the control room and lighting groups will be switched on only as and when necessary.

4.5.5 Lighting will generally be installed along the walkways and stairways around the process equipment to provide illumination for safe access and operational tasks, and at night will only be switched on when operators need access to a specific level and where appropriate for health and safety reasons.

4.5.6 The turbine and boiler building lighting will be switched on permanently as feeding of fuel from the bunker to the feed hopper are essential for the 24-hour operation of the facility. The Boiler building is covered with solid cladding, which will minimise fugitive light emissions from this area.

4.5.7 For the administration/visitors’ area, lighting will generally be switched off outside of normal working hours, unless nightshift operators need specific access to the offices or mess facilities.

CCTV

4.5.8 A Closed Circuit Television system for process monitoring and security will be installed on site and will include IP-server/recorder-unit, LCD Monitors, high-performance speed dome cameras (360° endless panning, PTZ) and ¼” colour high-resolution day/night zoom cameras.

4.5.9 The camera locations will be determined at the detailed design stage. All camera footage will be recorded and retained for a minimum of 90 days.
4.5.10 PTZ cameras will be capable of rotating vertically and horizontally through a sufficient angle to cover the areas of interest and of zooming in on areas of interest.

4.5.11 The CCTV system will generate a label for each image indicating the location and identity of the camera which has produced the image. For security purposes, cameras monitoring external areas will be installed with motion detection and alarms for automatic activation outside normal daytime working hours.

4.5.12 The CCTV system will have the functionality to record, view and store images from different locations all around the plant.

**Drainage**

4.5.13 The proposed biomass CHP plant will be served by a kerb/slot drain system discharging to the below ground pipe infrastructure. Flows collected from the internal roadway, associated hardstanding areas e.g. car parking and chipping areas will be passed through a Class 1 Bypass Separator compliant with the Environment Agency’s pollution guidance documentation.

4.5.14 Roof surface water run-off from the central building will be routed to the surface water piped system, for disposal with other treated run-off.

4.5.15 The surface water will be directed to an attenuation pond at the eastern end of the site. The pond will provide attenuation storage for rainfall events to allow reduced run-off rates.

4.5.16 The pond will also allow sequestering for storage of Fire Water (estimated at 450m³) to allow water quality testing of the water in the event of a fire on site. Once the impounded Fire Water has been tested it can either be discharged to the Foul Water system or in the event of contamination removed from site by tanker.

4.5.17 The receptor for the surface water discharge will be the main sewer buried below the proposed roadway south of the development site. Stobart (who will be providing the main sewer as part of their development and initially own the surface water and foul water drainage system on the 3MG Stobart Park until it is adopted by United Utilities) can accept surface water rates of up to 75l/s into their sewer system from the biomass site. Flows from the proposed development site will be restricted by a commercial available flow restriction device (e.g. Hydrobrake).

4.5.18 The surface water will be discharging into a tidal system. Due to the height of the site above the modelled flood levels (see Appendix D) the drainage network will not become tide-locked and so will be able to discharge into Steward’s Brook for all flood events up to and including the 1 in 1000 year fluvial/tidal event. Therefore, on site attenuation is not required for tide locking.

**Landscaping**

4.5.19 By virtue of the intrinsic nature of the proposal and setting, there is limited scope to introduce a broad integrated landscaping scheme as the site will be built on a bed of stabilised galligu effectively creating a concrete finish across the whole site. However, localised soft landscaping, including grassland and shrubs, will be provided where appropriate. Further detail is provided in Chapter 10.

**Fencing**

4.5.20 The site perimeter will be fenced with 1.8 m high steel palisade fencing.

**Retaining Structure adjacent to Steward’s Brook embankment**

4.5.21 This proposed will include the installation of steel sheet piling with a concrete cap as a retaining structure adjacent to the embankment to Steward’s Brook as shown on Figure 4.5.
Detailed Description of Process Operations

Biomass Reception

4.6.1 The fuel for the solid biomass CHP plant will comprise virgin and recycled wood, some of which will be sourced from the surrounding area. The wood fuels will be delivered to site in vehicles into their respective storage areas within the Fuel Store. Provision for chipping the solid wood fuel is provided on site.

4.6.2 Ready chipped wood fuel will be offloaded directly into the fuel unloading pit for automatic transport to the fuel storage facility.

4.6.3 The wood fuels will be transferred to an intermediate fuel storage facility and fed into the inlet of fuel feed system. The total storage capacity within the Fuel Store will be approximately 6,000 m³ which is sufficient to enable the solid biomass CHP plant to operate for about 3-5 days.

Combustion

4.6.4 The operation of the plant will be subject to the requirements of the Industrial Emissions Directive (IED) (2010/75/EU) which will replace the Waste Incineration Directive (200/76/EC) for new plants from 6th January 2013. The solid biomass CHP plant incorporates a single, moving grate stoker-fired combustion unit, rated at approximately 70MWth, with a dedicated secondary combustion chamber to provide a residence time of at least two seconds at a temperature greater than 850°C.

Energy Recovery and Electricity Generation

4.6.5 A high pressure boiler, incorporating preheater and economizer functions and an exhaust gas scrubbing unit will be connected to the exit of the combustion process. Steam generated within the boiler will be utilised to drive a turbine generator set capable of producing approximately 22MWe of electricity, with approximately 20MWe available for export to the distribution network.

4.6.6 Sufficient renewable electricity will be supplied by the solid biomass CHP plant as a whole to supply in the region of 49,000 residential properties within the Widnes area, using estimated annual household electricity consumption figures provided by Ofgem. The generated electricity will be distributed to local users and the local grid network via an underground cable from the site. It is expected that up to 3.5 MW(th) of thermal energy generated by the process will also be utilised within the 3MG Stobart Park.

Chemical Storage

4.6.7 In addition to the wood fuel stored on site within the designated area, there will be small quantities of chemicals stored on site. These additional materials are listed in Table 1 with their approximate annual usage. The bulk of the material is for use within the pollution control system.

4.6.8 The materials will all be stored in accordance with the Control of Substances Hazardous to Health Regulations (1988 and subsequent amendments). All storage areas will be enclosed within the proposed building and will be bunded to prevent loss of liquid material should an incident occur resulting in containment failure.

Table 4.1 Raw material usage

<table>
<thead>
<tr>
<th>Substance/Materials</th>
<th>Process Area</th>
<th>Approx. Preliminary Annual Quantity</th>
</tr>
</thead>
</table>

Table 4.1 Raw material usage

<table>
<thead>
<tr>
<th>Substance/Materials</th>
<th>Process Area</th>
<th>Approx. Preliminary Annual Quantity</th>
</tr>
</thead>
</table>

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RPS
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4.7 Utilities

Water Supply

4.7.1 Water supply will be drawn from the town water supply within the proposed new access road.

Foul Water

4.7.2 This will be discharged via a new foul sewer being constructed along the new access road to the south.

4.8 Emissions and Residues

Atmospheric Emissions

4.8.1 Details of the atmospheric emissions from the proposed facility are provided in chapter 7 of the Environmental Statement.

Solid Waste Residues

4.8.2 The biomass CHP plant will produce two solid residues as a consequence of the energy recovery process. This will be in the form of coarse bottom ash and a fine fly ash/Air Pollution Control (APC) residue.

4.8.3 BWSC estimates that bottom ash would arise at a rate of about 0.5 t/h, and fly ash would arise at a rate of about 0.2 t/h. This would yield approximately 4,000 tpa of bottom ash and approximately 1,600 tpa of APC residue/fly ash.

4.8.4 The bottom ash and fly ash/APC residues will be collected separately. The bottom ash is suitable for incorporation as an inert filler in construction materials such as aggregates, breeze blocks, etc. The fly ash/APC is different due to the addition of chemicals to control emissions of acid gases and oxides of nitrogen in the flue gas, which may make its utilisation less certain. Opportunities are being explored for utilisation of the fly ash/APC residue stream in preference to disposal to landfill.

Effluent

4.8.5 Process effluent from the solid biomass CHP plant will be made up primarily of blow down water from the main boiler. This will be treated for pH and temperature, prior to discharge to the foul sewer. The estimated foul water effluent generated by the site including process water and toilets etc is 17 m³/day.

4.9 Traffic and Parking

Vehicle Numbers - Operational
4.9.1 It is expected that the chipped biomass material will be delivered to the site by trucks fitted with walking floors. Each truck will be capable of delivering approximately 28 tonnes of ready chipped recycled wood fuel. Discussions are ongoing with the fuel suppliers to determine the capacity and frequency of delivery.

4.9.2 Bottom ash and fly ash/APC residue will be dispatched from the site in sealed skips (for fly ash) and covered skips (for bottom ash). Ash will be removed from the site by truck approximately 3 times per week (6 truck movements per week).

4.9.3 The operational traffic to the site will be approximately 2 lorries per hour (4 movements) from 7.00 am to 6.00pm during week days and 7.00 am to 12 (midday) on Saturdays.

Vehicle Parking

4.9.4 The proposed development will include 14 parking spaces for staff and visitors including 2 disabled parking spaces.

4.10 Staffing

4.10.1 The facility will employ about 21 staff operating on a 5-shift cycle. There will be 2 operational staff on site at any one time per shift plus 10-11 staff dedicated to administration, fuel and maintenance during the day. The staff will be split approximately 1/3 professional/managerial (e.g. engineers), 1/3 skilled (e.g. electricians), 1/3 unskilled labour. A number of indirect jobs are supported in the transportation of biomass to the site.

4.11 Hours of Operation

4.11.1 The normal operational hours of the facility will be 24 hours a day 365 days a year.

4.11.2 The hours for reception of biomass/export of ash will be:
- 07:00 to 18.00 hrs Monday to Friday
- 07:00 to 12.00 Saturdays

4.11.3 There will be no reception of biomass/export of ash on Sundays or Bank Holidays

4.12 Monitoring

4.12.1 The proposed monitoring arrangements are summarised below. These will be agreed in detail through the Environmental Permitting process administered by the EA.

Bottom Ash Sampling

4.12.2 Ash samples will be analysed for carbon in ash, heavy metals, dioxins and other prescribed substances with the aim of ensuring that these are at acceptable levels and that the combustion process is operating correctly. Samples will be taken and tested by an independent accredited laboratory.

Flue Gases

4.12.3 Flue gases will be analysed upstream of the FGT system as well as following FGT, which will allow optimal control over emissions and materials dosed into the FGT system. The monitoring of flue gases will be accomplished through the use of a continuous emissions monitoring systems (CEMS) comprising a sample
handling system, analyser unit and logging/reporting equipment. These systems use various analytical technologies to determine the gas composition on a continuous basis.

4.12.4 The components measured will, as a minimum, be those stipulated by current legislation, together with others required for process control purposes and will comprise particulate, HCl, SO2, NO, NO2, VOC, NH3, CO and O2. The gases to be monitored will be specified in the Environmental Permit and data will be available to the EA in real time. The system will have an emergency electrical supply with sufficient capacity to maintain the system for at least 30 minutes in the event of a power failure. All monitoring instruments will be regularly calibrated.

4.12.5 A continuously operating standby emissions control system will also be in operation in the event of a problem with the duty systems or whilst maintenance on the duty system is taking place.

4.12.6 Dioxin/furan and heavy metal sampling will be undertaken in accordance with the Environmental Permit. The sampling will be carried out by an independent company/laboratory and is expected to be supplemented by tests carried out by the EA.

4.13 Process Control

4.13.1 The operation of the biomass CHP plant will be managed through a central Distributed Control System (DCS) which will control all processes associated with its operation. It will ensure that fuel cannot be loaded into the combustion units until all of the required operational parameters are met (correct temperature, sufficient residence time, cooling capacity, etc).

4.13.2 The power generation plant will be linked directly to the central DCS from which the appropriate parameters will be monitored to maintain the performance of the generating equipment. This will be a fully automated system with appropriate controls in place to maintain the integrity of the plant and to ensure that the connection to the electricity distribution network is maintained.

4.13.3 The emissions from the power plant will be monitored by an IED compliant Continuous Emissions Monitoring System (CEMS).

4.14 Development Phases

Construction Phase

4.14.1 Construction is expected to commence in early 2013.

Operational Phase

4.14.2 The facility is anticipated to be operational in early 2015.

Decommissioning Phase

4.14.3 Planning permission is sought for permanent development on the site and therefore it is not considered necessary to consider the impacts of decommissioning within this Environmental Statement

4.15 Hazard Prevention and Environmental Controls

Fire
4.15.1 Comprehensive fire protection and detection systems will be installed within the plant to prevent fires occurring. In addition to these systems, standard health and safety procedures will be put in place. These will include measures such as the prohibition of smoking. Flammable liquids and chemicals will be kept in sealed containers/tanks within bunded storage areas.

4.15.2 Fire water holding tanks, sprinkler systems, hose reels, extinguisher points and a “hot load” bay will also be included to meet appropriate Fire Regulation standards.

Environmental Controls

Environmental Permit

4.15.3 The plant cannot be operated until an Environmental Permit is obtained from the Environment Agency. Subsequent operation of the plant will be subject to the requirements of this Environmental Permit. Environmental controls will be included in the Permit governing the day to day operation of the facility and emissions to air, water and soil. The Environmental Permit will be the main method of ensuring operational controls are implemented. An Environmental Permit application has been prepared in parallel with the Planning Application and will be submitted to the Environment Agency prior to any planning determination.

Spillages of Additives

4.15.4 Additives and chemicals will be stored in sealed tanks within bunded storage areas with a capability of containing up to 110% of the capacity of the storage tank. Additives and reagents including lime and activated carbon will be fed into the process automatically and there should be no requirement for human intervention in this process. The delivery of all additives will follow standard health and safety, and Control of Substances Hazardous to Health (COSHH) procedures. In the event of a spillage, the bunds will retain all liquids; these will then be pumped into tankers and removed from the site.

Emissions to Air

4.15.5 The potential impacts of the plant emissions to the atmosphere are discussed in Chapter 7: Air Quality.

Odour and Dust Suppression

4.15.6 Odour, dust and other environmental impacts from the facility will be controlled in accordance with the requirements of the EA Environmental Permitting guidance and are also considered in more detail in Chapter 7: Air Quality.

Noise

4.15.7 The potential impacts of noise emissions are discussed in Chapter 9: Noise and Vibration

Plant Maintenance and Shutdown

4.15.8 The plant is expected to operate continuously throughout the year with the exception of maintenance periods. Typically there will be a single week and a two week shutdown planned each year. During these time inspections, cleaning and planned maintenance work is carried out.

Abnormal Operating Conditions

Failure of a Bag Filter

4.15.9 Failure of a filter bag is an irregular event, which would be detected by the monitoring equipment, which sends a warning to the operators in the control room. The bag filters are then tested to locate the faulty bag
and this section of the filter is isolated, shut down and the bag replaced. Individual bag failure will not result in an exceedance of the Environmental Permit limits.

**Failure of FGT System**

4.15.10 There are various standby items (e.g., a standby atomiser) which can readily be installed to enable the plant to remain operational. If a lime injection system failure were to occur then unspent lime on the filter bags will ensure that the combustion conditions and emissions comply with the Environmental Permit during an emergency shutdown.

**Failure of Other Systems**

4.15.11 The plant has been designed with stand-by systems and redundancy in equipment and this, together with a comprehensive planned maintenance programme, ensures the plant will remain operational and in compliance with the Environmental Permit.

**Emergency Shutdown**

4.15.12 If any incident endangers or is likely to endanger personnel, or there is a risk of serious damage to the facility, then an emergency shutdown will be necessary. Prior to the plant becoming operational, precise operating procedures will be adopted for the various possible scenarios according to the likelihood of incidents in the facility, the safety of personnel and the equipment in place.

### 4.16 Construction

**Construction Programme and Activities**

4.16.1 The construction programme is expected to take 24 months. The key construction activities and approximate dates are set out below:

- Site preparation, Q1-2013
- Earthworks, Q2-Q3-2013
- The importation of fill material is required in order to raise overall site floor level to an appropriate level in relation to the surrounding Stobart Park development. The proposed remediation measure involves the use of galligus from the adjacent Stobart Park site to be stabilised and used as fill at the site. This is discussed in further detail in Chapter 12 and Appendix 12.1
- Piling Q2-Q3-2013
- Concrete works Q3-Q4-2013
- Plant construction Q1-Q3-2014
- Commissioning and operation Q3 2014 - Q1 2015

4.16.2 Figure 4.6 Construction Plan (Drawing 3424-D2004101) shows the location of key on site activities during construction.

**Working Hours**

4.16.3 Normal hours of construction will be:

- 07.00-18.00 Monday – Friday
- 07:00 - 12:00 Saturday
• Indoor construction and test activities may take place 24/7

4.16.4 No outside construction work will take place on Sundays, Public or Bank Holidays

4.16.5 It may be necessary to receive abnormal (heavy) loads outside normal working hours or on Sundays, Public or Bank Holidays

Plant

4.16.6 Plant to be used during the construction phase will 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; and
• Piling Rigs

Staff

4.16.7 It is anticipated that, at peak, approximately 90 construction staff would be on site.

Access

4.16.8 The site would be accessed via the proposed Spine Road due to be constructed as part of the Phase 1 Infrastructure Works for Stobart Park.

Construction Traffic

4.16.9 This section provides an estimate of potential HGV movements during construction. The assessment takes account of the worst-case scenario which would involve the importation of clean fill material to raise site levels. This would generate HGV traffic on the public highway and these potential HGV movements have been taken account in the EIA. Under the preferred option stabilised galligu material would be used from the adjacent Stobart development site and this would not result in additional HGV movements on the public highway.

4.16.10 The quantity of fill material required is approximately 27,000m³. In the event that this comprises clean fill material imported from outside the Stobart development, it is estimated that assuming an average load of 9 m³, and a daily input of 400 m³, this would result in an average of 45 loads (90 movements) per day over a 67 day period. This will occur during the earthworks phase of construction.
4.16.11 In addition it is understood that there would be up to approximately 10 HGV movements (two way) per day involved in delivering materials to the site during the construction of the plant.

4.16.12 The peak HGV movements (two way) during construction is therefore likely to be approximately 10.

4.16.13 In addition, it is expected that the site would employ around 90 workers at its peak. It is anticipated that the majority of these (say 75%) would arrive on-site before 07.00 and either leave the site during the day or after 18.00.

4.16.14 Assuming then (as an absolute worst-case) that all of the employees arrive in his/her own vehicle during the AM peak hour, and depart during the PM peak hour (06.30-07.30 and 18.00-19.00), this would give rise to an estimated construction traffic generation of a maximum two way flow of 100 trips, including 10 HGV movements.

**Security**

4.16.15 The construction site boundary will be secured using a fencing system with gated access points onto site at the positions off the access road.

4.16.16 Site personnel access routes will be segregated from construction vehicular traffic.

**Storage of Construction Plant and Materials**

4.16.17 During construction, the construction area will be segregated into stores, fuelling area, plant parking and materials storage. General construction materials and overnight parking of plant will occur within the development site boundary which will be provided with 24 hour security/CCTV monitoring.

4.16.18 Stores will be positioned for easy access for small tools and plant will organised so fire fighting equipment and spill kits are easily accessible.

4.16.19 The storage area will be constructed with a clean stone platform/existing hardstanding and timbers/pallets available for the off-loading of materials to ensure that the materials remain clean and fit for use.

4.16.20 Materials in need of added protection from the elements will be sheeted when required, this will be assessed as part of the build contractor’s quality procedures and a materials management plan will be produced for all major items.

4.16.21 Most materials will be transported to the work area as required, but for major materials deliveries will be co-ordinated so they will be transported on site to the designated live work area and unloaded for immediate erection.

**Site Operative and Visitor Parking**

4.16.22 Directional signage for the building contractors will be placed, subject to agreement, in prominent positions off access roads directing construction/visitor’s traffic to the site compound off the main site access road.

4.16.23 Once entering the compound a defined route will be in place directing the personnel traffic into the site compound parking area.

4.16.24 Vehicular and pedestrian traffic will be separated wherever possible to mitigate risk of potential interface incidents. A defined route will be placed to direct the site personnel from the compound to the main construction site; this will be segregated to mitigate risk of collision between pedestrians and vehicles.

**Loading and Unloading of Plant and Materials**
4.16.25 Construction delivery and plant traffic will be directed by means of prominent signage into the site along the existing site haul road.

4.16.26 On entry to the site a check point, with gate man/security guard in attendance, will be placed with visible signage requesting delivery drivers to sign in and notify site personnel prior to entry into the construction work area.

4.16.27 All loads and tickets will be checked prior to the off loading of materials and plant on site, or within the designated materials laydown area.

4.16.28 All off loading activities will be carried out under a permit to work procedure.

**Wheel Wash facilities**

4.16.29 In the event that clean fill material is imported from outside the Stobart Park site wheel wash/vehicle wash down area will be located at the exit from the site and will be used during construction. The wheel wash is likely to comprise a drive on/off platform, complete with water hoses and a power washer hand lance.

### 4.17 Environmental Management

4.17.1 To control environmental issues during construction a Construction Environmental Management Plan (CEMP) will be produced. The CEMP forms part of the Project Management Plan (PMP) which integrates core arrangements for health and safety, quality and environmental management for the project. This integrated approach ensures that environmental aspects are considered at all stages of the design and construction process.

4.17.2 The likely environmental issues and management procedures to be addressed by the CEMP are discussed below.

#### Measures to Control the Emission of Dust and Dirt During Construction

4.17.3 Dust and dirt emissions will be monitored by the site engineer on a daily basis dependant on the weather conditions / elements and activities being carried out. To supplement the use of the wheel wash (which will prevent the majority of dust and dirt from being carried onto the public highway) dust will be managed by using dedicated haul roads, dust screens and damping down where appropriate. Vehicles and plant will be regularly maintained and inspected to ensure that emissions are within acceptable limits.

#### Pollution to Ground and Surface Water

4.17.4 All liquids and solids of a potentially hazardous nature (e.g. diesel fuel, oils, solvents) will be stored on surfaced areas, with bunding, to the satisfaction of the EA in accordance with current guidance.

4.17.5 All fuel and/or chemical storage tanks located on site will also be bunded in order to limit the impact of any leakages that occur. The containment area will be capable of holding 110% of the volume of the largest tank or 25% of the total volume likely to be stored for multiple containers, whichever is greater. Any fuel tankers entering the site will only be permitted to park in designated areas in order to reduce the potential for fuel to leak into watercourses or damage construction materials present on-site.

4.17.6 Storage areas will also be organised providing space for materials to be removed with ease when they are required. If heavy machinery is required to move materials, this will also be taken into account allowing space for machinery to manoeuvre.

4.17.7 The construction sub-contractor will take all practicable measures to prevent the mobilisation or migration of contaminants to surface water and groundwater during the works, primarily by the use of surface water...
control measures (grips, channels and containment tanks). In addition, the management plan for the prevention of pollution to ground and surface water will identify measures such as:

- Use of drip trays under static plant;
- Restrictions on fuelling and storage;
- Control of surface water run-off using grips, stilling ponds, settlement tanks;
- Assessment and use of materials; and
- Spill kits stored in appropriate locations and checked weekly for stock level.

**Noise**

4.17.8 During construction, good engineering and environmental practice will be used to reduce noise. This includes agreement of and adherence to site working hours, use of low noise producing plant and equipment, banning of unnecessary noise production and neighbourhood noise monitoring at sensitive boundaries and receptors (if required).

4.17.9 In advance of the works the number of residential and other noise sensitive properties likely to be affected by the works will be assessed.

**Vibration**

4.17.10 During construction, driven piling or vibratory piling activities will have the potential to give rise to vibration effects. Significant vibration effects due to HGVs are unlikely provided that the haul roads are well maintained (so as to not contain significant potholes or ruts).

4.17.11 It is anticipated that continuous flight auger (CFA) piling will be employed for the construction works on the application site. In comparison to other piling methods involving impact or vibratory driven piles, this method of piling is much quieter and produces negligible levels of ground vibration.

**Construction Traffic Impacts**

4.17.12 Construction of the proposed development will have associated construction traffic, comprising the construction vehicles, construction plant, and other diesel powered vehicles. This will result in emissions of nitrogen oxides, fine particles and other combustion related pollutants.

4.17.13 The construction phase will generate emissions from the exhausts of construction vehicles but it is considered that the effect of emissions during this phase will not be significant for the closest residents, assuming the implementation of mitigation measures in accordance with industry best practice.

4.17.14 A construction traffic management plan (CTMP) will be produced. The CTMP will include specific requirements, such as an optimal construction traffic route to the site to avoid key residential areas and Widnes and Runcorn town centres.

4.17.15 In order to minimise the potential impact to the local area and residents from traffic emanating from the site, the arrival and departure of HGVs will be controlled where practicable. Furthermore, the Contractors will also propose a suitable route which will be agreed with the relevant authorities (HBC, Highways Agency).

**Site Waste Management Plan (SWMP)**

4.17.16 A SWMP will be produced to address the segregation of site waste generated throughout construction. The plan will account for waste generated within the site compound and office set up which will be separated between general household type waste generated from the messing facilities and paper waste which will be disposed in designated paper recycling bins.
4.17.17 The waste generated from construction activities will be separated on site in general waste, timber waste and steel waste skips; this will be managed by the contractor and will be removed from site to an appropriate facility for processing.
**NOTES:**

1. Construction to the perimeter walls shared with Stewards Brook (north and west) will require Environment Agency review/consent, as the area falls within the flood zone to the top of the existing bank to Stewards Brook.
2. It has been calculated that the Biomass site will require approximately 70,000m³ of material to achieve a Proctor Level of 12.65m.
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