16.0 MATERIAL ASSETS

16.1 INTRODUCTION

This chapter evaluates the impacts, if any, which the development will have on material assets. In the EPA advice notes on current practice in the preparation of Environmental Impact Assessments, 2003, material assets are defined as '*resources that are valued and that are intrinsic to specific places, they may be either human or natural origin and the value may arise for either economic or cultural reasons*'. Table 16.1 outlines the recommended objectives which the EPA recommended should be assessed as part of the material assets study.

Table 16.1 Material Assets – EPA Recommended Assessment Objectives

Asset Type	Natural Origin	Human Origin
Economic Asset	- assimilative capacity (air &water) - non renewable resources	- settlements - transportation infrastructure - major utilities - ownership and access
Cultural Asset	- archaeology - architecture - settlements - monuments, features, landmarks - historic sites and structures - geological heritage	- language and dialects - folklore and tradition - religion and belief - literary and artistic association

The assessment of cultural heritage is discussed under Section 15.1 Archaeological and Cultural Heritage, and therefore this section evaluates the economic assets only.

16.2 OWNERSHIP AND ACCESS

As outlined in Section 1, the proposed development consists of the construction of a power plant at an 11 hectare brownfield site in Lumcloon, Co. Offaly. The proposed facility will include a building to house the power plant, gas turbines, heat recovery steam generators and steam turbine generators, administration / control building, raw and fire water storage, demineralisation water treatment plant, warehouse / stores building and internal roads and parking. Lumcloon Energy is applying for full planning permission for this development. There

will be no severance of land as a result of the proposed development or loss of rights of ways or amenities or rezoning of land required.

16.3 WATER SUPPLY AND USAGE

16.3.1 Process Water

Water for use in the process will be pumped from the existing on site well which served the former peat burning power plant and cooling towers. Raw water will be stored on site in a tank of approximately 3,500m^3 for the process. Water will be pumped from the raw water storage tank to the water demineralisation treatment plant for use in the power generation process as high purity water is required to prevent degradation to plant components and maintain the integrity and performance of the power plant. Figure 2.10 contained in Chapter 2, illustrates the water and wastewater flows at the proposed development.

The water treatment process will consist of filtration, and either a resin based or a Reverse Osmosis and Electro De-ionisation (EDI) based treatment system. pH adjustment will be provided by acid (sulphuric) or alkali (sodium hydroxide) addition as required. Additional equipment may be applied to the system if the water quality warrants it. This equipment may include an optional decarbonator and a softener, if required.

Oxygen scavenging and thermal de-aeration will be combined to remove dissolved oxygen from the boiler water, which again prohibits corrosion. It is expected that demineralisation water consumption (losses and blow-down) will be in the range of 0.5 to 1.0% of the maximum steam flow from HRSGs to compensate for boiler blow down for a condensing plant without process extractions. A 0.5% flow would equate to a need for approximately 1m^3 of water per hour per HRSG, which equates to approximately 96m^3 per day (approximately one litre per second). Deviations may appear during unusual conditions and as a result requirement may at times be in the range of 3% of the HRSG steaming rate. The figure will also be influenced by raw water quality and the selected method of water treatment.

The capacity of the demineralised water storage tank will be sized following consideration of the volume required for filling up of the steam/water system. At this stage it is estimated that the volume required to fill system from empty will be approximately 420m^3. Therefore it is proposed to install two 300m^3 water tanks to supply the HRSG system.

16.3.1.1 Process Wastewater Treatment

Process wastewater will consist of wastewater from the demineralisation plant and wastewater generated from boiler blow-down. Wastewater from the demineralisation plant will comprise water containing the salts removed from the raw water or neutralised backwash of the resins from the demineralisation process. Boiler blow-down is water which has been circulating in the water/steam cycle of the process. Process wastewater will be continuously generated from the plant while in combined cycle operation mode. There will be little wastewater generated while in open cycle mode. Typical normal wastewater volumes generated will be approximately $96m^3$ per day.

Steam generated in the HRSGs will be used to drive the steam turbine generators. The steam will then be condensed back to water via the air cooled condensers for reuse in the process. Therefore, no cooling waters will be discharged. Process effluents from the plant will be routed via the on-site process wastewater treatment plant to effluent drainage system. The process wastewater treatment plant will comprise a below-ground concrete structure containing a number of chambers, which will allow agitating and pH and temperature correction. Continuous monitoring will be undertaken in the final chamber for dissolved oxygen, pH, conductivity and temperature. Treated process wastewater will then be discharged via the wastewater collection system to the Silver River via the discharge point located in the north eastern corner of the site.

An automatic sampler will also be positioned at the discharge point which will sample water discharges on a continuous basis over a given period as prescribed by the Integrated Pollution Prevention and Control (IPPC) licence. An on site laboratory will also be provided to facilitate monitoring of specific parameters on site.

A more detailed description of the plant's process effluent streams is provided in Chapter 2, Project Description.

16.3.2 Potable Water

Potable water will be obtained from the Leabeg – Leamore Group Water Scheme. It is estimated that a maximum of $3.5m^3$ per day of potable water will be required for use at the facility, i.e. canteen, washing facilities, etc. It is proposed to source *'grey'* water i.e. that required for flushing toilets and other service use, from the on site well via the raw water storage tank.

16.3.3 Fire Water/ Water Storage Tank

Raw water will be stored on site in a tank of approximately 3,500m^3 for the process. This raw water storage tank will also serve as a reservoir for fire fighting purposes. In case of fire the applied fire fighting water will be drained into those parts of the plants effluent system which drain the affected areas and the resulting streams will finally be delivered to the facility's storm water drain or effluent drain.

16.3.4 Foul Wastewater

Foul wastewater, comprising wastewater other than process waste water and surface water, will be treated in a proprietary treatment system prior to discharge. Treated wastewater (from canteen and toilets) will be discharged to the Silver River via the stream which runs along the northern boundary. However the option of percolating to ground will also be considered at detailed design stage following completion of a site suitability assessment. This will require percolation testing to determine the suitability of the site for this purpose.

16.3.5 Surface Water

Surface water collected from roofed and paved areas will be delivered to the storm water drainage system. In order to ensure that uncontaminated surface water drains are not mixing with possibly oil contaminated surface water drains, 'oil risk areas' will discharge into a separate collection system. Surface water will be routed via an oil/water interceptor and be discharged through an attenuation tank (controlled discharge) to Silver River via the stream in the north eastern corner of the site. Large external areas/compounds at the site will be surfaced with stone to allow rainwater to percolate to the underlying soils.

During times when chemicals are handled, isolation valves will be closed. This is to ensure that accidently spilled chemicals do not enter the storm water drain. The isolation valves will only be opened again once it has been determined that contamination of the downstream system can be excluded.

General plant drainage consists of effluents produced by sample drains, equipment drains, equipment leakage, area wash-downs, etc. This effluent will be collected in a system of floor drains and sumps and routed to the condensate pit which represents the lowest drainage point in the plant. From there it will be delivered to the wastewater treatment plant via a water/oil separator

16.4 AIR

An assessment of the existing air quality and proposed impacts and mitigation measures are described in Section 11 Air Quality.

16.5 NON RENEWABLE RESOURCES

Non renewable resources are defined as resources that are not continuously replenished by nature, the most well know being fossil fuels including coal, oil etc. Details of the proposed raw materials including non renewable resources are described in Section 2, Project Description.

In so far as possible, non renewable construction materials will be sourced locally and all imported material that will be used on site will be from approved sources. Further details regarding the construction of the development are outlined in Chapter 3, Construction.

16.6 SETTLEMENTS (INCLUDING LANDUSE AND TOURISM)

The existing site is located approximately 5km south east of Ferbane. Other nearby settlements include:

- Athlone – located approximately 22km from the site
- Birr – located approximately 15km south of the site
- Tullamore – located approximately 20km from the site
- Ballinasloe – located approximately 33 km west of the site

The settlements in close proximity to the townland of Lumcloon, has been evaluated in detail in Section 4, Human Beings.

16.6.1 Landuse

Lumcloon Energy acquired the brownfield site in 2008 which was the site of the old Ferbane Power Plant. The plant was closed in 2000 and was decommissioned with the station building demolished in 2003. The site meets all the technical and financial requirements for the development of a modern Gas Turbine based thermal power plant. Prior to selling the site the ESB received planning permission in 2004 from Offaly County Council for a 100 MW Simple Gas Turbine power plant at the proposed site. The site has access to grid connection for a power plant in excess of 300MWs by confluence of four 110kv three phase transmission lines at the site. The site is well serviced with accessible roadways, water sources, waste disposal

facilities and other necessary amenities as existed during the construction and operation of the previous peat fired power plant located at the site.

The proposed facility will be located on an area of approximately 11 acres, as the proposed development will be constructed on Lumcloon Energy's lands only and not on any other agricultural lands

16.6.2 Tourism

Tourism is discussed under Section 4, Human Beings.

16.7 TRANSPORTATION INFRASTRUCTURE

Details regarding the road network are discussed under Section 14, Traffic.

16.8 WASTE MANAGEMENT

16.8.1 Waste Management: Construction Phase

Disposal of waste during the construction phase is described in Section 3, Construction.

16.8.2 Waste Management: Operational Phase

16.8.2.1 Process Waste

The treatment of process waste water is detailed in Section 16.2.1. This section describes the waste management process whereby all wastes produced by the proposed development will be properly collected, treated as necessary and disposed of.

16.8.2.2 Non-Hazardous Solid Waste

The operation and maintenance of the plant will generate non-hazardous solid waste typical for power generation facilities. This waste will include scrap metal and plastic, insulation material, paper, glass, empty containers and other miscellaneous solid wastes. These materials will be disposed of by means of contracted refuse collection and recycling services.

16.8.2.3 Hazardous Solid and Liquid Waste

The methods used to properly collect and dispose of any given hazardous solid or liquid waste generated by the plant will depend on the nature of the waste. Hazardous solid and liquid waste that will be generated by the plant includes;

- Spent lubrication oil filters
- Waste lubrication oil
- Fuel oil from failed start attempts acid and alkaline cleaning solutions used for pre-operational chemical cleaning of the HRSG pressure parts and steam cycle piping systems
- Acid cleaning solutions used for periodic chemical cleaning of the HRSG
- Boiler cleaning solution for periodic cleaning of the HRSG fire side

These wastes will be stored temporarily on-site and later disposed of by specialised licensed contractors.

16.9 SITE UTILITIES

16.9.1 Electricity / Gas Supply

The power plant will supply electricity via the regulated electricity market. Natural gas, supplied from the Bord Gais Network grid, will be the primary fuel source for the facility. Natural gas will be supplied at a pressure of 70 bar-g via a 450mm buried pipeline entering the site at its north west corner. At the above ground installation the pressure will be let down to 35 bar-g. It will then flow via a buried pipeline to the gas receiving area at the north west of the turbine buildings. From here the gas will pass into the turbine buildings and will flow into the gas turbine units. As discussed previously, the construction of gas pipeline from the gas network to the site is not part of this planning application.

To comply with the Commission for Energy Regulation, diesel will be used as backup fuel in the event of interruption to the natural gas supply. Five days running capacity of diesel will be stored on site, (approximately 5,000m^3) within a 110% capacity bund. The diesel oil will be limited to 0.1% sulphur in fuel as per the requirements of EU Directive 1999/32/EC (relating to a reduction in the sulphur content of certain liquid fuels). Connection to the National Grid will be the subject of a separate application, which will be conducted by the applicant in association with the Electricity Supply Board (ESB). The plant will consume approximately 15MW of power (house load) as part of its operation.

16.10 IMPACTS AND MITIGATION MEASURES

16.10.1 Ownership and Access

All lands within this application are currently brownfield. The proposed facility will not result in any significant environmental impacts relating to land severance or land access as the applicant owns all the lands relating to this application. The brownfield site which was once the site of the Ferbane power plant will be returned to a similar landuse. The impacts that the proposed development will have on the environment have been assessed in full in Chapters 3 to 15 and mitigation measures required to reduce significant impacts have been outlined.

16.10.2 Water Supply and Usage

Water for the site including process water and fire water will be supplied from an on site well. Section 8, Groundwater, has assessed the impacts that such a water demand will have on the sites aquifer and outlined the necessary mitigation measures to avoid any significant impacts on the environment.

The requirements to ensure prevention and control of fire will be addressed under a separate application to the Fire Authority. All mitigation measures required to ensure safety on site will be regulated by the Fire Authority.

The foul water generated on site will be treated to a standard as required by the EPA and Local Planning Authority. The foul wastewater treatment plant will be installed and maintained in accordance with the manufacturer's specification. During installation mitigation measures as outlined in Chapter 9, Hydrology, will be adhered to in order to prevent surface water contamination. Impacts and mitigation measures associated with surface water are detailed in full in Chapter 9.

16.10.3 Non Renewable Resources

The type and quantity of non renewable raw materials proposed to be used at the facility and during construction are outlined in Chapter 2, Project Description and Chapter 3, Construction. Where possible non renewable resources will be will be sourced from locally approved sources. Further impacts and mitigation measures are detailed in Chapter 2 and Chapter 3 respectively.

16.10.4 Settlements (including agriculture and tourism)

Impacts and mitigation measures associated with human beings and tourism are detailed in Chapter 4, (Human Beings) as outlined previously. No significant impacts on agriculture will result with respect to land take and land severance as the land holding is entirely owned by Lumcloon Energy.

16.10.5 Transportation Infrastructure

Impacts and mitigation measures associated with transportation are detailed in Chapter 14, (Roads and Traffic).

16.10.6 Site Utilities

As outlined in Chapter 16.9, connection to the National Grid will be the subject of a separate planning application. This will be conducted by the Electricity Supply Board (ESB). The ESB is the regulating body for electricity supply in Ireland. Therefore the ESB will ensure that any requirements necessary for this proposed development will be met by the applicant and that no impact on the existing electricity supply will result.

Natural gas will be delivered to the plant via a new below ground high pressure pipeline from the existing Bord Gais Network. This development of the pipeline form the gas network near Athlone to the site in Lumcloon is not covered under this planning application.

16.11 RESIDUAL IMPACTS

With the above mitigation measures in place, neither the construction nor operational phases of the proposed redevelopment will result in any significant negative impacts on the existing economic assets.