New England Resource Recovery Centre
Nr Ivybridge, Devon

Environmental Permit (EP) Application
Non-Technical Summary

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1.0 INTRODUCTION

SLR Consulting Limited (SLR) has been instructed by Viridor to prepare an Environmental Permit (EP) application to operate a non hazardous Resource Recovery Centre (RRC) at New England Quarry, Devon.

The RRC will include an Energy from Waste (EfW) facility and non hazardous landfill. The proposed EfW facility will incorporate modern reliable and well understood technologies and will be designed in accordance with the requirements of the Waste Incineration Directive 89/76/EEC (WID) and will employ Best Available Techniques (BAT). The landfill will be fully engineered and contained in accordance with the Landfill Directive and Environmental Permitting (England and Wales) Regulations, 2007, which implements the Directive.

The information contained within this non technical summary is informed by the Environment Agency's explanatory notes on the Application Form Part B, which dictates that the Non Technical Summary should explain clearly what is being applied for, gives a summary of the regulated facilities and of the relevant key technical standards and control measures relating to the site.

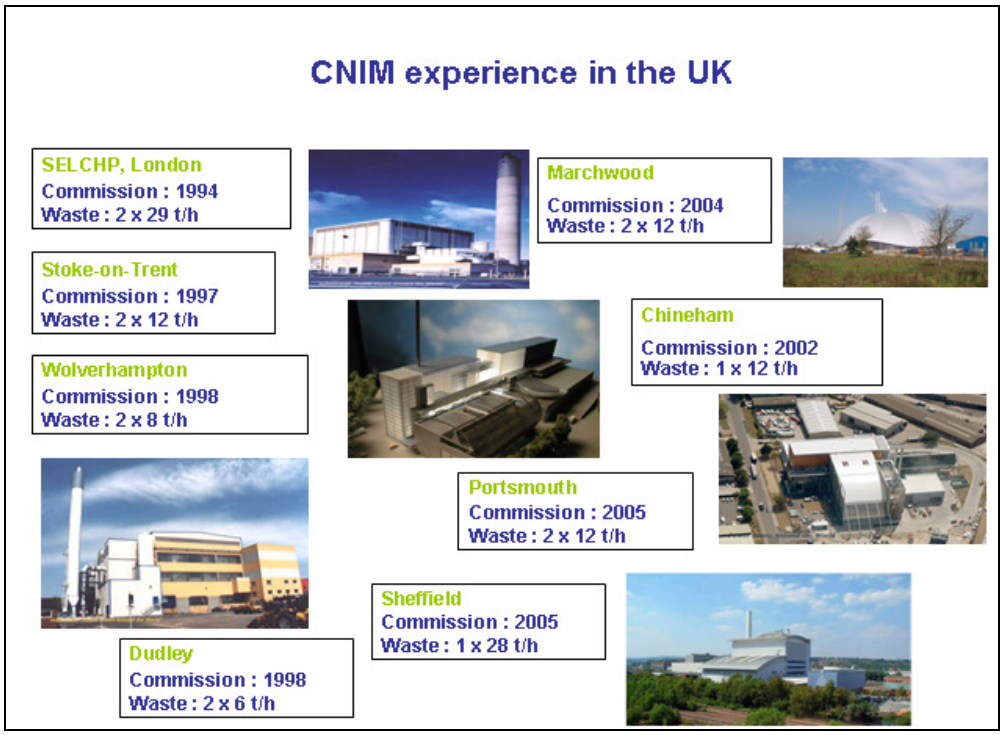
2.0 OVERVIEW OF DEVELOPMENT

Viridor propose to construct and operate a RRC facility comprising an EfW facility and a non-hazardous Landfill. The EfW facility is designed to accept up to 275,000 tonnes per annum (tpa) of residual municipal solid waste (rMSW), commercial and industrial (C&I) wastes. Reception and treatment of all wastes will take place within the EfW building. The non-hazardous landfill will accept approximately 33,000tpa (to a maximum of 60,000tpa) of wastes not suitable for the EfW facility. In addition, the landfill would accept all wastes destined for the EfW in the instance that both lines are closed for maintenance.

The EfW plant will be designed in order to comply with the requirements of the Waste Incineration Directive (WID) (200/76/EC) and the management system will be accredited to ISO14001. Process controls and operating techniques that are being proposed are considered to represent Best Available Techniques (BAT).

The proposed facility will incorporate modern reliable and well understood technologies. Examples of facilities which employ the CNIM design philosophy used elsewhere in the UK are shown in Figure 2-1.

Figure 2-1 CNIM Experience in the UK



2.1 Waste Reception Building

The proposed waste reception building will occupy the north-eastern part of the site. The building will enable the separation of rMSW and C&I wastes to ensure more operations.

The reception facility will consist of an enclosed building on the eastern edge of the EfW building.

2.2 Energy from Waste Facility

2.2.1 The Building

The proposed EfW facility will be totally enclosed within a purpose-built building that has been appropriately designed for its surroundings.

The operational element of the EfW will be contained within a single building. The only external elements will be the weighbridge/gatehouse and the air control condensers. It is important to stress that all wastes will be deposited within the building, and there will be no external storage, handling or processing of any combustible wastes.

The building is effectively circular with a gross diameter of 125m, and a net surface area of almost 46,000m^2. The building will be constructed on a development level of 60m AOD, and the external height of the building is 40m above ground level.

A key element of the building is the two stacks, the tops of which will be 90m above the ground level (of 60mAOD). The design of the stacks has been an important part of the design process: their width of 1.6m minimise their impact on the landscape.

Also included within the EfW building are offices, workshops, and a visitor centre.

2.2.2 The Process

With the exception of scheduled maintenance periods, the facility will operate on a 24-hour basis throughout the year, with the majority of the deliveries taking place between 7 a.m. and 5 p.m.

A simplified flow diagram of the EfW process is illustrated below as Figure 2-2.

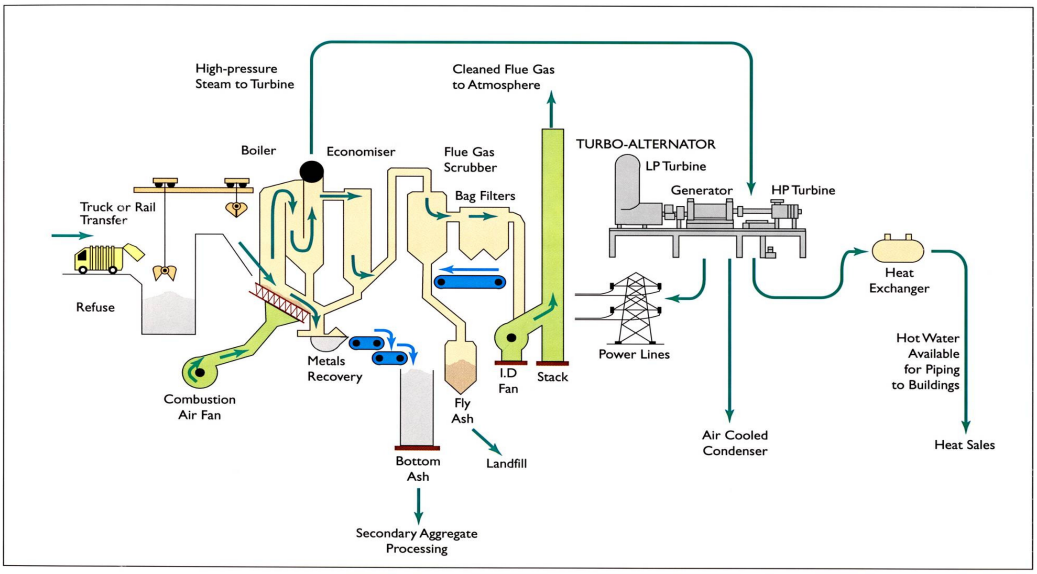
The operation of an EfW plant consists of five key elements that are described below:

1. Waste reception;
2. Combustion;
3. Energy Recovery;
4. Flue Gas Treatment;
5. Residue Handling.

2.2.3 Waste Reception

Up to 275,000 tonnes of rMSW and C&I waste will be delivered per year to the facility using bulk transfer and street refuse collection vehicles. All vehicles using the site will be covered to ensure that waste and odour are not released to the environment in the journey to the site.

Figure 2-2 EfW Flow Diagram



The reception building has been designed to enable the separate reception of rMSW and C&I wastes to enable the more efficient processing, shredding and recovery (where appropriate). Waste materials will be delivered into the building and deposited within designated tipping areas. Most material will then be taken to the EfW for processing, although over-sized elements will be shredded.

All vehicles delivering residual waste will be weighed when entering the site and proceed to the waste reception building. From here waste is transferred to the waste reception hall which operates at negative air pressure. The air is used in the waste combustion process which helps control odours arising in this area. This reception area is enclosed with access doors to manage traffic and air movements.

2.2.4 Combustion

Combustion takes place in two stages, with primary combustion undertaken on a moving mechanical grate to promote the mixing of burning/unburnt wastes. The combustion gas from the primary stage is heated further in the secondary combustion chamber to reach the specified minimum temperature of 850^0C for a minimum of two seconds. The burnt waste from primary combustion on the moving grate is removed as an ash, known as incinerator bottom ash (IBA).

2.2.5 Energy Recovery

Heat from waste combustion will be recovered in a waste heat recovery boiler to provide high pressure 60bar steam used in a steam turbo-generator to produce approximately 23.5MW_e gross. A proportion of site generated electricity will be used within the facility but the majority estimated at 22MW_e when fully operational will be exported to the National Grid.

An alternative use for this energy is that it can be passed out from the turbine and used to heat a local water network i.e. Combined Heat and Power (CHP). This is a more efficient use of the fuel source than electricity generation: surplus heat is not wasted as in conventional power generation, it is used where heat would have otherwise been generated using other fuels, such as fossil fuels.

In order to consider the potential for the use of heat, Viridor has contacted companies, operators, developers, landowners, facility managers and amenity providers within a 5km radius of New England.

The results of this exercise have demonstrated that there is some potential for existing and future development to utilise the excess heat generated by the plant. With the facility designed to allow the removal of the heat, Viridor is hopeful that by the time the facility is fully operational (2014) the contracts and infrastructure may be in place to utilise this important source of renewable energy.

2.2.6 Flue Gas Treatment

The air pollution control system forms an integral part of the plant and will treat all flue gas prior to emission to ensure that emissions meet the stringent EU Waste Incineration Directive (WID) (2000/76/EC) standards.

The flue gas treatment in the proposed facility will be a “dry” system, which will operate by injecting hydrated lime and activated carbon into the flue gases to control the pollutants. The gases are then filtered through a bag type filter, which removes the fly ash, reaction products and excess reagents from them. The treatment will also involve a process called “Selective non-catalytic reduction” (SNCR) to control the release of Nitrogen Oxide (NOx) gases. The process is a proven and widely used system of pollution abatement and will reduce the emissions from the facility to well within the stringent European emission limits.

2.2.7 Residue Handling

The EfW process generates three main waste residues:

- Incinerator Bottom Ash;
- Fly Ash; and
- Metals.

Incinerator Bottom Ash (IBA)

IBA is generated from the grate combustion unit, and amounts to approximately 22% of input material (approximately 60,500 tonnes per annum at New England) The inert material can be used in concrete and concrete block construction, replacing up to 50% of the aggregate traditionally used.

It is proposed that IBA will be treated and recycled to produce aggregate material at an on-site plant adjoining the EfW. The material will be moved from the EfW via a covered conveyor to the bottom ash facility.

The proposed incinerator bottom ash recycling facility is 130m long and 57m wide and will provide processing and storage capacity for the recyclable aggregate.

Fly Ash

Fly ash is the residue of combustion removed from the flue gases of the furnace prior to release into the atmosphere. This ash consists mostly of carbon dust, along with some pollutants, organic compounds and heavy metals. These are removed from the flue gases so that the emissions from the facility are clean prior to release, preventing pollution to the environment. Fly ash represents only about 3-5% by mass of the waste feedstock and is disposed of safely (by enclosed tanker) to a designated hazardous waste landfill. There is no facility of this nature within Devon and it is likely that the fly ash from New England will be disposed of at a licensed facility in Gloucestershire.

Viridor is currently considering alternative off-site options for re-use of the fly ash.

Metal Recovery

Following the combustion process, both ferrous and non ferrous metals are separated from the IBA to recover valuable metals for recycling. The quantity of metal that can be recovered from the IBA is generally about 5% depending on the waste feedstock, and thus represents a useful opportunity for significant amounts of metals recovery. All metals will be recycled and Viridor is currently in discussions with local recovery companies to carry this out.

2.3 The Landfill

The proposed landfill operation at New England Quarry will accept some 33,000 tpa of non-hazardous waste (to a maximum of 60,000tpa), which will ensure that the landfill is available for the proposed contract life of the EfW. The landfill will accept rejects from the EfW facility and any IBA that cannot be recovered, as well as all wastes destined for the EfW in the instance that both lines are closed for maintenance.

The engineering and tipping of waste will be completed on a phased basis, where by the engineering/ lining of each phase is completed whilst the previous phase is being filled with waste.

The phase by phase tipping of waste will advance up to the proposed pre-settlement top of waste profile. As each phase reaches the proposed landform levels, they will be progressively capped and restored with a 1.5m thickness of restoration materials.

Once pre-settlement levels have been achieved, the waste will be capped and restored as soon as possible.

3.0 TECHNICAL STANDARDS

Key technical standards laid out in the following documents will govern the design and operation of the RRC;

- The European Community (EC) Directive 2000/76/EC on the incineration of waste i.e. the 'Waste Incineration Directive' (WID);
- The Environmental Permitting (England and Wales) Regulations 2007;
- Relevant reference Environment Agency Guidance e.g. Environmental Permitting Guidance, TGN M1 and M2;
- EPR 5.01 The Incineration of Waste (March 2009); and
- EPR 5.02 Landfill (March 2009).

4.0 PROCESS CONTROLS

The RRC will be designed in order to ensure compliance with the requirements of WID and the Landfill Directive.

A range of process variables will be monitored throughout the EfW plant via the Distributed Control System (DCS) enabling automatic adjustment to achieve optimal performance. Continuous emissions monitoring (CEM) equipment includes measurements at both the front end combustion stage and the back end air pollution control stage.

The CEM equipment will be interlinked with the DCS for waste feeding, combustion and the air pollution control system to provide alarms / shut down for non compliant conditions and to enable the operator to safely shut down and start up the plant.

Operational management procedures will ensure that:

- the risks that the activities pose to the environment are identified;
- the measures that are required to minimise the risks are identified;
- the activities are managed in accordance with the management system;
- performance against the management system is audited at regular intervals; and
- the Environmental Permit is complied with.

The proposed landfill will be fully engineered and contained in accordance with the Landfill Directive and Environmental Permitting (England and Wales) Regulations, 2007, which implements the Directive.

The engineering and tipping of waste will be completed on a phased basis, where by the engineering/ lining of each phase is completed whilst the pre-curser phase is being filled with waste.

The phase by phase tipping of waste would advance up to the proposed pre-settlement top of waste profile. As each phase reaches the proposed landform levels, they would be progressively capped and restored.

Operations at the landfill will be under the control of a technically competent person who holds the relevant Certificate of Technical Competence (COTC) under the Waste Management Industry Training and Advisory Board (WAMITAB) scheme.

The installation of all elements of the landfill lining system will be subject to construction quality assurance (CQA). The CQA process ensures and documents, that the works are carried out in accordance with the specification. Prior to each stage of construction, a CQA Plan will be submitted for approval by the EA. This plan will present the specification for the works, and details the CQA activities and testing to be undertaken by the CQA engineer for each element of the works. Upon completion of the works a certification report shall be submitted to the EA, demonstrating that the construction works and CQA activities have been carried out in accordance with the CQA Plan.

5.0 POTENTIAL EMISSIONS AND CONTROLS

5.1 Energy from Waste

The proposed air pollution control equipment technology will be a combination of the four following processes;

- SNCR process into the furnace for Non Catalytic Reduction of NOx;
- neutralization of acid gases by injection of hydrated lime in a dry process;
- dioxin reduction by injection of activated carbon; and
- dust removal through a fabric bag filter.

A combined emission stack, comprised of two flues (one from each line) at a height of 90m is proposed. Determination of stack height and the prediction of emissions from the stack has been undertaken as part of the Air Quality Atmospheric Dispersion Modelling Assessment (included as Appendix BAT1).

The assessment quantified and assessed the resultant impacts from the proposed EfW facility using Environment Agency approved techniques and then clarified the significance of these impacts against published standards for the protection of human health and sensitive ecological receptors. For all WID pollutants, predicted emissions from the EfW were not found to be significant when compared with relevant air quality criteria.

5.2 Non Hazardous Landfill

The potential emissions from the non hazardous landfill are primarily leachate and landfill gas. The landfill has been designed on the principle of containment and will comply with the Landfill Directive.

The landfill design incorporates the following:

- Groundwater management - granular underdrainage
- Surface water management – surface water attenuation ponds
- Leachate management - leachate drainage blanket and collection system
- Landfill gas management - regulating layer below cap and collection system

There are no statutory designated habitats sites within the application boundary or its immediate vicinity.

In order to mitigate surface water run-off various techniques have been applied to the design of the site that include sizing of lagoons, provision of cut off valves, filter drains etc.

Rainwater runoff from car parks and internal site roads will be collected via a system of drains and gullies, which will direct runoff through oil interceptor(s) prior to discharging the runoff to the proposed surface water attenuation ponds that will be provided for the development.

Discharge from the ponds will be to controlled waters, the River Yealm. There will be a foul water connection to the sewer, servicing domestic facilities. There will be no routine process water discharge from the RRC. There will be no point source emissions to groundwater from the EfW facility.

Potential fugitive emissions from the site have been addressed in the H1 Risk Assessment (Part 1) following the guidelines in Environment Agency Technical Guidance EPR – H1, Part 1 'Simple Assessment of Environmental Risk for Accidents, Odour, Noise and Fugitive Emissions'. In line with the guidance, the assessment reviewed odour, noise and vibration, fugitive emissions and environmental accidents.

Due to the implementation of mitigation and management measures, e.g. the provision of containment bunds and sealed drainage system, inspection, maintenance and monitoring procedures, provision of an accident management plan, the potential risks associated with the proposed activities at New England RRC are not likely to be significant.

6.0 MONITORING

Point source emissions to air will be monitored in accordance with the Environmental Permit and will be monitored continuously (unless otherwise stated), including during commissioning, start up and shut down.

The proposed monitoring regime, including the monitoring frequency and emission limit values for point source emissions to air is detailed in the Air Quality Atmospheric Dispersion Modelling Assessment.

The monitoring regime will enable Viridor to assess the performance of the abatement systems and facilitate early identification of any potential environmental impacts.

The Digital Control System (DCS) will enable process variables which could have an effect on performance of the facility and / or emissions to the environment to be monitored.

Operational procedures will be in place which will include routine olfactory and visual monitoring to ensure that the operations comply with the conditions of the Environmental Permit.

Environmental monitoring has been proposed for the landfill in the following risk assessments:

- Section 7: Operating Techniques
    - Appendix OT3 Surface Water Management Plan
- Section 8: Hydrogeological Risk Assessment
- Section 10: Landfill Gas Risk Assessment

7.0 OVERALL CONCLUSION

The overall conclusion from the comprehensive studies undertaken is that there is unlikely to be a significant environmental impact as a result of the activities proposed at New England RRC.

The facility will make a significant beneficial contribution to waste management in South West Devon, ensuring that residents and businesses meet their obligations to reduce the amount of waste that is sent to landfill. The proposed development is entirely in accordance with the prevailing development plan and will ensure that the policies included therein can be effectively implemented. The application of this technology is proven throughout the UK and Europe and will not compromise recycling rates.

The proposal is in compliance with the intentions of national and local authorities to promote sustainable methods of waste management and the Resource Recovery Facility proposed at New England will deliver the infrastructure required to drive forward sustainable waste management in South West Devon.

8.0 CLOSURE

This report has been prepared by SLR Consulting Limited with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

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