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# Construction Waste Management Plan

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**Table 1: Solid Waste Management Hierarchy**

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**Figure 4.1: A diagrammatic representative of the structure of waste management**

## 1. INTRODUCTION

NRGE Ltd. has prepared a Construction Waste Management Plan for the development of a biogas plant consisting of 2 no Digester Tanks, 2 no Validation Tanks, 1 no Homogenising Tank, 3 no Geo-Membrane Lined Manure Storage Tanks, 1 no Fibre Store, 1 no Feed Tank, Reception Building, Plant Building, Pasteurisation Tanks, Weighbridge and associated site works including an Integrated Constructed Wetlands to produce renewable energy and fertiliser at Barryshall, Timoleague, Co. Cork by Timoleague Agri Gen Ltd. The purpose of this CWMP is to ensure that wastes arising from the proposed construction works on the proposed Biogas Plant are managed, reused, recovered or disposed of by a method that ensures the provisions of the Waste Management Acts 1996-2007 and associated regulations are complied with. It also ensures that the optimum levels of waste reduction, re-use and recycling are achieved.

Waste management priorities of this project are based on the principal of the EU waste management hierarchy as illustrated in the figure 1 below.

**Table 1: Solid Waste Management Hierarchy**

Source Reduction and Reuse Recycling/Composting	Most preferred
Combustion with Energy Recovery	
Land-filling and Incineration without energy recovery	Least Preferred

In accordance with the EU Waste Hierarchy, the following waste management priorities have been established with respect to this facility:

1. Prevent material wastage
2. Minimise the quantity of waste
3. Reuse of site materials
4. Recycling of waste
5. Energy recovery
6. Disposal

## **2. C & D WASTE MANAGEMENT IN IRELAND**

### **2.1 National Level**

The Government issued a Policy Statement in September 1998, known as *Changing Our Ways*, which identifies objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this strategy was to recycle at least 50% of C&D waste within a five year period (by 2003), with a progressive increase to at least 85% over fifteen years (by 2013). In response to the *Changing Our Ways* report, a task force (Task Force 84) representing the waste sector of the already established forum for the construction industry, released a report entitled *Recycling of Construction and Demolition generated in Ireland*, including a large portion of recovery from landfill. The recovery of C&D waste, other than soils and stones, has increased to 44%.

### **2.2 Regional Level**

The proposed development is located in the Local Authority area of Cork County Council. Cork County Council has produced a current Regional Waste Management Plan for the period. Government waste policy was set out in 1998 in the policy document *Changing Our Ways*.

The document set a target of 85% recovery for C&D waste by 2013. Policy 15.5 of the Cork Waste Management Plan states that "*the overall objective is to maximise the reuse and recycling of C&D waste through the implementation of the voluntary NCDWC initiative.*"

## **3. DESCRIPTION OF THE PROJECT**

### **3.1 Location, Size and Scale of the Development**

The proposed development is to be undertaken on 3.67ha agricultural site consisting of a greenfield site. It involves the construction of a biogas plant on the green field consisting of 2 no digester tanks, 2 no validation tanks, 1 no homogenising tank, 3 no geo-membrane lined manure storage tanks, 1 no fibre store, 1 no feed tank, reception building, plant building, pasteurisation tanks, weighbridge and associated site works including an Integrated Constructed Wetlands to produce renewable energy and fertiliser.

### **3.2 Details of the wastes to be produced**

#### **3.2.1 Construction Phase**

During the construction phase there will be a surplus of materials such as off-cuts from timber and broken concrete blocks, tiles and bricks. Waste from packaging and over supply of materials will also be generated. Subsoil will be required to create burms for planting on the site.

Other wastes that will arise from the construction phase of the development will be from the site compound i.e. canteen waste and temporary W/C utilities.

### 3.3 Main C&D Waste Categories

The main non-hazardous and hazardous waste streams that will be generated by the construction activities at a typical site are shown in Table 3.1. The European Waste Code (EWC) classification for each waste stream is also shown.

**Table 2: European Waste Codes**

Waste Description	EWC Code
Soil and stone	17 05 04
Concrete etc	17 05 07
Wood	17 02 01
Bituminous mixtures	17 03 02
Gypsum	17 08 02
Iron and steel	17 04 05
Insulation materials	17 06 04
Canteen waste	20 03 01

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It is the responsibility of all personnel on site including Contractors, Sub-Contractors and their Employees to ensure compliance with this C&D WMP.

### 3.4 Anticipated Hazardous Waste Arising

Soil tests should be carried out on excavated soil if deemed appropriate when excavations are undertaken. Fuels stored on site that will be used during the construction phase are classed as hazardous. There will be fuel stored on site for machinery and construction vehicles. All fuel tanks and draw off points will be bunded. If the fuel is correctly contained and bunded, it is not expected that there will be any fuel wastage at the site.

## 4. ESTIMATED WASTE ARISING

### 4.1 Construction Waste Generation

If any contaminated material is encountered during the construction works, this will increase the disposal rate. Any potentially contaminated material encountered will have to

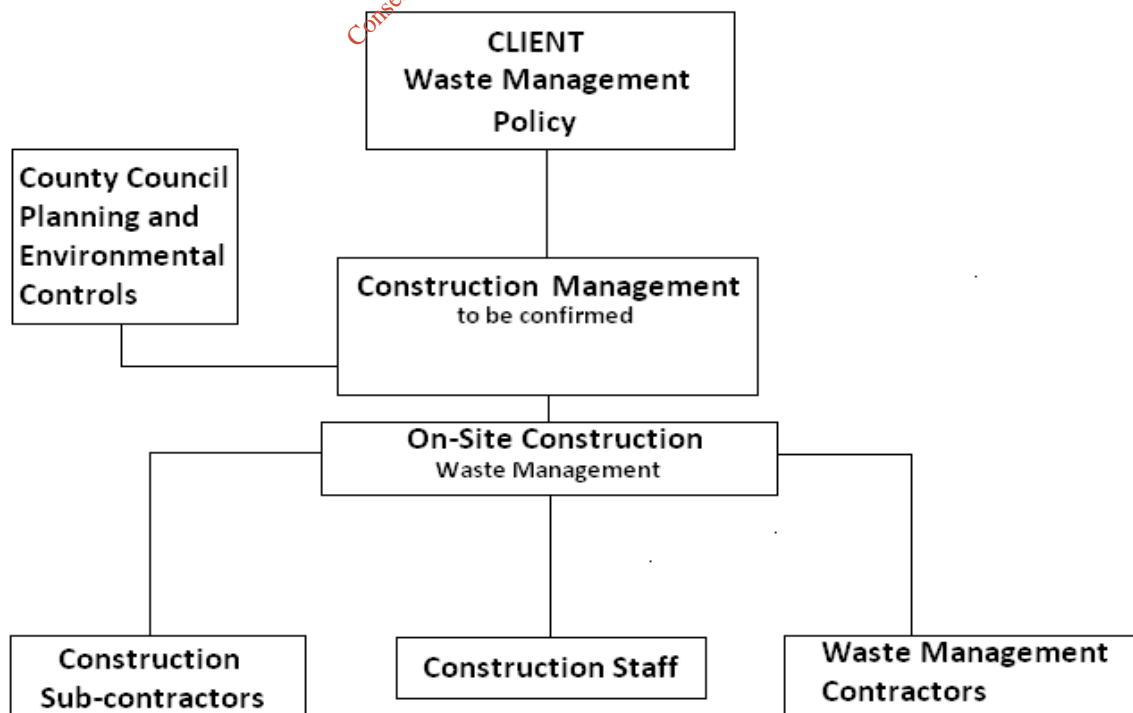
be classified and disposed of in accordance with Council Decision 2003/33/EC10, which establishes criteria for the acceptance of waste at landfills, and in accordance with Cork County Council directions. Cork County Council and the EPA are to be notified if hazardous waste is uncovered.

#### 4.2 Proposed Waste Management Options

Waste will be segregated on site. See **Figure 4.1** for an indicative representation of the C&D Waste Storage Area (WSA). The C&D WSA will have skips and receptacles for all recyclable wastes. The appointed waste contractor will collect and transfer the recyclable wastes as receptacles are filled. The non-recyclable waste will be transferred by an authorised waste collector to an appropriate facility. Numerous waste contractors in the Cork region carry out this operation.

A successful C&D Waste Management Plan is largely dependent on how readily it can be integrated in to normal site operations by the person responsible. It is recognised that the plan should not be obstructive to site operations and the construction programme by placing the responsibility of construction waste management with the Manager, all reuse, recycling, wastage and necessary disposal can be monitored as close to the source as possible. An Environmental Representative from each Works Sub-Contractor will also be nominated responsible for all waste management in their own operations. In this way, it is possible to identify where the greatest material wastage occurs, with a view to implementing better management both in this and future projects.

**Figure 4.1: A diagrammatic representative of the structure of waste management**



The site Construction Manager will be designated as the Responsible Person and have overall responsibility for the implementation of the on-site C&D WMP. The Responsible Person will be assigned the authority to instruct all site personnel to comply with the specific provisions of the plan. At the operational level, a nominated Environmental Representative from each sub-contractor company on the site shall be assigned the direct responsibility to ensure that the discrete operations stated in the C&D WMP are performed on an on-going basis.

### Bedrock, Blocks and Concrete

The majority of the C&D waste will be clean, inert material and it is proposed to reuse it for construction purposes where possible. If bedrock is encountered during excavations, it will either be crushed on-site and used for infill during construction or be removed from the site by appropriately permitted waste collectors. Rock recovered from the site will be recovered at an authorised site locally.

### Soil/Subsoil

Excess inert soils and sub-soils excavated that is not required for use as fill on site will be recovered off-site. Soil will only be removed by authorised waste collectors to an authorised site. Any fill material excavated at the site, which is deemed to be contaminated (i.e. non-hazardous or hazardous) will be stored separately to the inert material, sampled and tested, in order to appropriately classify the material as non-hazardous or hazardous in accordance with Council Decision 2003/33/EC10, which establishes the criteria for the acceptance of waste at landfills before being transported to an appropriately authorised facility by permitted contractors.

### Plastic

As plastic is now considered a highly recyclable material, much of the plastic generated during construction will be diverted from landfill and recycled. The plastic will be segregated at source and kept as clean as possible and stored in a dedicated skip.

### Timber

There will be timber waste generated from the construction work as off-cuts or damaged pieces of timber or from the demolished buildings. Timber that is uncontaminated i.e. free from paints, preservatives, glues etc, will all be recycled. It will be collected on-site in a designated area, and collected by a timber recycling company, or a recycling company that will pass it on to a timber recycling company. Such companies shred the timber and use it in energy recovery or for manufacture of wood products or for landscaping woodchips etc.

### Scrap Metal

Steel is a highly recyclable material and there are numerous companies that will accept waste steel and other scrap metals. A segregated skip will be available for steel/metal storage on-site pending recycling.

### Cardboard Packaging

Cardboard packaging can also be recycled. Card board will be flattened and placed in a covered skip to prevent it getting wet.

### Plasterboard

Waste gypsum can be recycled into new plasterboard. A skip will be provided for the separate collection of waste plasterboard and collected as necessary.

### Hazardous Wastes

On-site storage of any hazardous wastes produced will be minimised with off-site removal organised on a regular basis. Appropriate storage of all hazardous wastes on-site will be undertaken including bunding of fuels, lubricants etc so as to minimise exposure to on-site personnel (and the public) and to also minimise potential for environmental impacts. Hazardous wastes will be recovered wherever possible and failing this, disposed of appropriately.

### Canteen Wastes / W/C utilities Wastes

Regular housekeeping of the temporary canteen/W/C areas will be carried out. Removal of domestic waste from the construction compound will be carried out by a permitted waste contractor. Any temporary W/C utilities used on site during the construction phase will be maintained by an approved and permitted contractor.

## **4.3 Tracking and documentation procedures for off-site waste**

The Waste Manager will maintain a copy of all waste collection permits. If waste (soil & stone) is being accepted on-site, a waste docket must be issued to the collector. If the waste is being transported to another site, a copy of the waste permit or EPA Waste Licence for that site must be provided to the waste manager. If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) document must be obtained from Dublin City Council (as this is the relevant authority on behalf of all authorities in Ireland) and kept on-site along with details of the final destination (permits, licences etc). As well as a waste collection docket, a receipt from the final destination of the material will be kept as part of the on-site waste management records. All information will be entered in a waste management system to be maintained on-site.



#### **4.4 Disposal of C&D Waste**

There will be a general skip or receptacle for C&D waste not suitable for reuse or recovery. This skip will include general wet waste (mixed food waste and food packaging), contaminated cardboard, contaminated plastic etc. Workers on the site will be encouraged to recycle as much municipal waste as possible i.e. cardboard, plastic, metals and glass. Prior to removal, the municipal waste receptacle will be examined by either the foreperson or a member of his/her team to determine if recyclable materials have been placed in there. If this is the case, effort will be made to determine the cause of the waste not being segregated correctly.

#### **5. ESTIMATED COST OF WASTE MANAGEMENT**

The cost of waste management is difficult to estimate at this stage of the development for a number of reasons:

Firstly, waste costs have changed significantly over the past few years and are set to keep changing as regional waste management plans are implanted fully and the emphasis of reduce reuse recycle increases. In addition, the changing economic climate has significantly reduced waste management costs.

##### **5.1 Reuse**

By re-using materials on-site, there will be a reduction in transport and disposal costs for a waste contractor taking the material away.

#### **6. TRAINING PROVISIONS FOR WASTE MANAGER AND SITE CREW**

A waste manager will be appointed to ensure commitment, operational efficiency and accountability during the C&D phase.

##### **6.1 Site Manager Training and Responsibility**

The waste manager will be given responsibility and authority to select a waste team if required i.e. members of the site crew that will aid him in the organisation, operation and recording the waste management system implemented on-site. The waste manager will have overall responsibility to oversee record and provide feedback to the client on everyday waste management at the site. Authority will be given to the waste manager to delegate responsibility to sub-contractors where necessary and to co-ordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and salvage. The waste manager will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for waste management on-site. He will also be trained in the best method for segregation and storage of recyclable materials, have information on the materials that can be reused on-site and know how to implement the C&D WMP.

## **6.2 Site Crew Waste Management Training**

Training of the site crew is the responsibility of the waste manager and as such, a waste training program should be organised. A basic awareness course will be held for all crew to outline the C&D WMP and to detail the segregation of waste at source. This may be incorporated with other training needs (e.g. general site induction, safety training etc). This basic course will describe the materials to be segregated, the storage methods and the location of the waste storage areas. A subsection on hazardous wastes will be incorporated and the particular dangers of each hazardous waste will be explained.

## **7. RECORD KEEPING**

Records will be kept for each waste material which leaves the site, whether for reuse on another site, recovery, recycling or disposal. A system will be put in place to record the construction waste arising on-site.

The waste manager or delegate will record the following:

1. Waste taken off-site for reuse
2. Waste taken off-site for recovery
3. Waste taken off-site for recycling
4. Waste taken off-site for disposal
5. Waste (soil & stone) accepted on-site for recovery

For each movement of waste off-site, a signed waste collection docket will be obtained by the waste manager (or delegate) from the contractor. This will be carried out for each material type. This system will also be linked with the delivery records.

A signed waste acceptance docket will be issued for each movement of waste on-site.

## **8. OUTLINE WASTE AUDIT PROCEDURE**

### **8.1 Responsibility for Waste Audit**

The appointed waste manager will be responsible for conducting a waste audit at the site during the C&D phase of the development.

### **8.2 Review of Records and Identification of Corrective Actions**

A review of all the records for the waste generated and transported off-site, as well as waste accepted, should be undertaken mid-way through the C&D phase. If waste movements are not accounted for, the reasons for this should be established in order to see if and why the record keeping system has not been maintained. Each material type will be examined in order to see where the largest percentage waste generation is occurring. The waste

management methods for each material type will be reviewed in order to highlight how the targets can be achieved. Waste management costs will also be reviewed. Upon completion of the C&D phase a final report will be prepared summarising the outcomes of waste management processes adopted and the total recycling/reuse/recovery figures for the development.

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## 9. CONSULTATION WITH RELEVANT BODIES

### 9.1 Local Authority

Mayo County Council will be consulted as required throughout the C&D phase in order to ensure that all available waste reduction, re-use and recycling opportunities are identified and utilised. In addition, the local authority will be consulted when required under the relevant legislation.

### 9.2 Recycling/Salvage Companies

Companies that specialise in C&D waste management will be contacted to determine their suitability for engagement. If used, each company will be audited in order to ensure that relevant and up-to-date waste collection permits and/or licence are held. In addition, information regarding individual C&D materials will be obtained including the feasibility of recycling each material, the costs of recycling/reclamation and the means by which the wastes will be collected and transported off-site, and the recycling/reclamation process each material will undergo off-site.

A breakdown of the anticipated waste streams arising and waste management options to be used are described in the table below.

**Table 3: Anticipated Waste Streams**

Waste Item	Waste Category	On-site Storage/Treatment Method	Off-site Treatment/Disposal Method	Anticipated Waste Removal Contractors
General (mixed)	I	Segregated Bin/Skip	Recovery/Disposal	To be appointed
Surplus Excavated Material	III	Stockpiling Topsoil, fractions to be in separate	Majority to be re-used on-site. Possible beneficial reuse off-site	To be appointed
Timber	III	Segregate/Bin/Skip Reuse on-site where possible	Reuse or energy recovery	To be appointed
Plastic	III	Segregated Bin/Skip	Return to supplier, recycling or disposal	To be appointed
Metal	III	Segregated Bin/Skip	Deliver to metals merchant	To be appointed