A Non-Technical Summary

Composting is nature's way of recycling biodegradable organic wastes and it not only reduces the volume of waste going to landfill for disposal but produces a material that is a natural fertiliser and soil amendment product. North Tipperary is part of the Midlands Waste Management Area and the Regional Management Plan for this area is inline with the Irish Government's policy Statement on Waste Management (Oct 1998) which aims for :

- Diversion of 50% of overall household waste away from landfill
- Minimum of 65% reduction in biodegradable waste consigned to landfill.

More recently the Draft Strategy Report on the National Strategy on Biodegradable Waste (Department of Environment Heritage and Local Government, April 2004) and Landfill Directive (1999/31/EC) aim to reduce landfilling of biodegradable municipal waste to 75% of 1995 levels by 2006 (with subsequent targets of 50% by 2009 and 35% by 2016).

The development of the Shannon Vermicomposting Limited composting facility at Coolross would make a significant contribution on a regional scale to the fulfilment of the these objectives. Vermicomposting is a very efficient method of waste reclamation, i.e. 1 tonne of organic waste is reduced to 100 kg of worm cast compost by the combination of aeration composting and vermicomposting that will be undertaken at the site. 50 kg of the worm cast compost produced will be re-used as an amendment material in the initial mixing of the organic wastes in the waste reception area and the other 50% will be used for growing mushrooms or as a soil amendment material.

Shannon Vermicomposting has been composting biodegradable organic wastes at this site in Coolross, Rathcabbin, Co. Tipperary since 1998. The site is a small 2.7 hectare area located 1.8 km north of the village of Rathcabbin. Initially the activity was conducted on a very small scale and the composting was primarily for research of different methods and materials. In 2002, the company was granted planning permission (PLC/24499) to develop 20 tunnels at the site. A waste permit (WP TN 08) to compost biodegradable waste per annum was also granted to the company in 2002. The 20 tunnels will be used for the composting of the wastes and for growing mushrooms. Construction at the site is progressing and a second planning application was lodged with North Tipperary Co. Council in June 2004. This new application will not increase the capacity of the site because there was sufficient capacity in the original planning permission to build 20 tunnels to compost in excess of 20,000 tonnes per annum but it will improve the operational and environmental protection facilities at the site. The waste permit that was obtained in 2002 was acquired to permit the staged development of the vermicomposting capacity of the facility. The company is making this Waste Application to the EPA in order to acquire a licence to fully utilise the facilities at the site by receiving up to 20,000 tonnes of biodegradable organic wastes per

annum. The waste recovery activities at the site are defined in the Fourth Schedule, Waste Recovery Activities of the Waste Management Act, 1996 as Class 2, Class 11 and Class 13 with Class 2 being the principal activity.

The raw materials for the facility will comprise 10,800 tonnes of household green waste provided from waste transfer stations, 2,700 tonnes of sewage sludge, 4,500 tonnes of commercial green organic wastes and 2,000 tonnes of wood chippings. The energy requirements for the facility will be supplied by a three-phase electricity supply and up to 24,000 litres of diesel will be used on an annual basis to power machinery and back-up generators. Water will be supplied by an on-site well and underground storage tanks. The available storage capacity for 23,000 gallons.

The vermicomposting operation is a 5-stage process that converts biodegradable organic waste materials into a quality compost product. The five stages of the process comprise:

1. Waste reception
2. Pre-vermicomposting aeration
3. Screening
4. Vermicomposting
5. Product utilisation

A flow diagram summarizing the overall process is attached.

In summary the process comprises;

1. Waste reception: At the waste reception, the incoming biodegradable organic waste will be tipped and the material passed by a FAN Separator that will separate the solid and liquid fractions. The liquid fraction will be collected in one of two pasteurization tanks and pasteurized by heating it to a temperature of 70^0C for 1-hour. The pasteurised liquid fraction will be consumed and processed by the worms at a later stage of the process. The solid fraction will be moved to one of the mixing bays where amendment material comprising wood chippings and mature compost is mixed with it before it is moved to the aeration tunnels.

2. Pre-vermicomposting aeration: In the tunnels, four forced aeration pipes located in the floor of the tunel blows air through the composting pile. The aim of this stage of the process is to achieve the total elimination of all pathogens by the heat generated by the composting and the stabilization of the compost prior to the vermicomposting stage. The compost will be turned every four days during this phase and an overhead sprinkler system will keep the compost sufficiently moist. Each tunnel is fitted with an underground leachate collection tank. All the collected leachate is sprinkled

back onto the compost to keep it moist and to ensure that the system is sealed. A separate supply of leachate or water will be available for each tank if extra liquid is required.

3. Screening: After the aeration process, the compost is screened through an electric screener to produce an even sized material for the vermicomposting process. The oversized components, which generally comprises wood chippings are returned to the reception building to be re-mixed with new wastes and any inorganic material is moved to the rejection bay.

4. Vermicomposting: The compost is then moved to the vermicomposting tunnels where it is placed on the worm beds. The compost is spread in layers up to 150mm at a time. In the right conditions, 1 tonne of worms can consume their equivalent weight of composted material and liquid in a 24-hour period. The parameters that influence the rate at which the vermicomposting is progresses are:

Worm bed temperature

Population / density of the worm stock per square foot

Moisture levels

The pH of the bed.

The temperature of the worm bed can be regulated by the flow rate of air through the bed. Warm air from the aeration tunnels will be circulated through the worm beds to keep these at the required temperature. The extracted air from the vermicomposting tunnels will be fed back through the aeration tunnels to maintain a balanced air system. The other factor that is related to the temperature is the moisture content of the bed. The optimum moisture level is maintained by the in-tunnel sprinkler system which uses liquid from the pasteurization tank plus liquid from the tunnel's leachate collection tank.

5. Product Utilisation: Shannon Vermicomposting currently produces compost that is used as a feed for the worm population or an amendment material added at the start of the composting process. When the vermicomposting tunnels are operational, the facility will produce a top quality worm cast compost. This will be used, in part for growing mushrooms, in part as an amendment material for composting and as a soil amendment material to be mixed with sand for use on parts of golf courses.

The vermicomposting process produces no significant waste material. The operation of the site will produce a limited volume of wastes and arrangements will be made with licensed waste contractors for the removal and disposal of these wastes. These include:

- Spent oil and oil filters from the vehicle maintenance plus oil gathered from the interceptor will be disposed off by Atlas Oil Ltd.
- Sediment from the wheel wash plus normal office wastes will be collected by a licensed waste contractor.

When the facility is fully operational, the waste reception/mixing and the composting processes will be conducted indoors. All these buildings have concrete floors with underground leachate collection tanks. There is therefore be no discharge or leakages to the groundwater from the process. There is also be three interceptor tanks to collect oil run-off from the bunded fuelling area or the wheelwash and also to collect dirty water from the wheelwash. There is also no direct surface run-off to external drains from the site. The groundwater will also be protected by the installation at the site of a Puroflo proprietary mechanical aeration system plus percolation trenches to treat the effluent from the staff toilets, canteen and offices. Potential odours from the initial composting of the organic wastes are eliminated by piping the extracted air from the aeration tunnels to the vermicomposting tunnels where the worm beds act as biofilters. The air that passes through the worm bed is then treated by ozone disinfection defusers before it is extracted from these tunnels and passed through a second biofilter. A risk assessment study was completed by an independent expert to appraise potential dust and bioaerosol concentrations from the site. The study concluded that if effective management of the site and the compost is maintained, the risk to sensitive receptors remains very small.

Emergency procedures and facilities in place at the site to prevent unexpected emissions from the site include the provision of an adequate supply of fire water, back-up diesel generators in the event of a loss of mains electric power, the provision of excess capacity within the tunnels plus the ability to alter the composting process when circumstances require. In the event of a serious incident at the facility, no additional organic waste would be accepted until the problem had been fully dealt with.

The site at Coolross will not have a negative impact on the environment in the case of a shut down of the facility and there will be no residual environmental impacts post closure. In the event of a shut down of the facility, Shannon Vermicomposting would immediately cease to receive any additional organic wastes at the site. The composting of the wastes present at the site at that time would be completed and the finished compost would be utilised as a soil amendment.

The fuel tanks at the site would be emptied over the closing period and the tanks would be returned to a fuel depot. All the machinery that is used at the facility is either agricultural or industrial and these would be sold.

The tunnels and waste reception building would be retained. These are agricultural buildings, comparable with other buildings that occur in a rural area. These could be used for a variety of other possible agricultural uses, including mushroom growing or storage uses.

After close-down of the site an environmental monitoring programme will continue to monitor groundwater and air quality for a specified period to be agreed with the EPA.

Flow diagram summarizing the overall process at Shannon Vermicomposting Ltd.