Viking Energy Partnership

Viking Wind Farm

Technical Appendix 14.7
Framework Site Waste Management Plan

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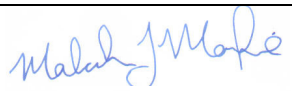
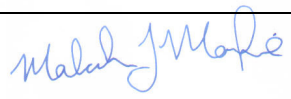
Checked by	Malcolm Macfie		24/02/09
Approved by	Malcolm Macfie		24/02/09

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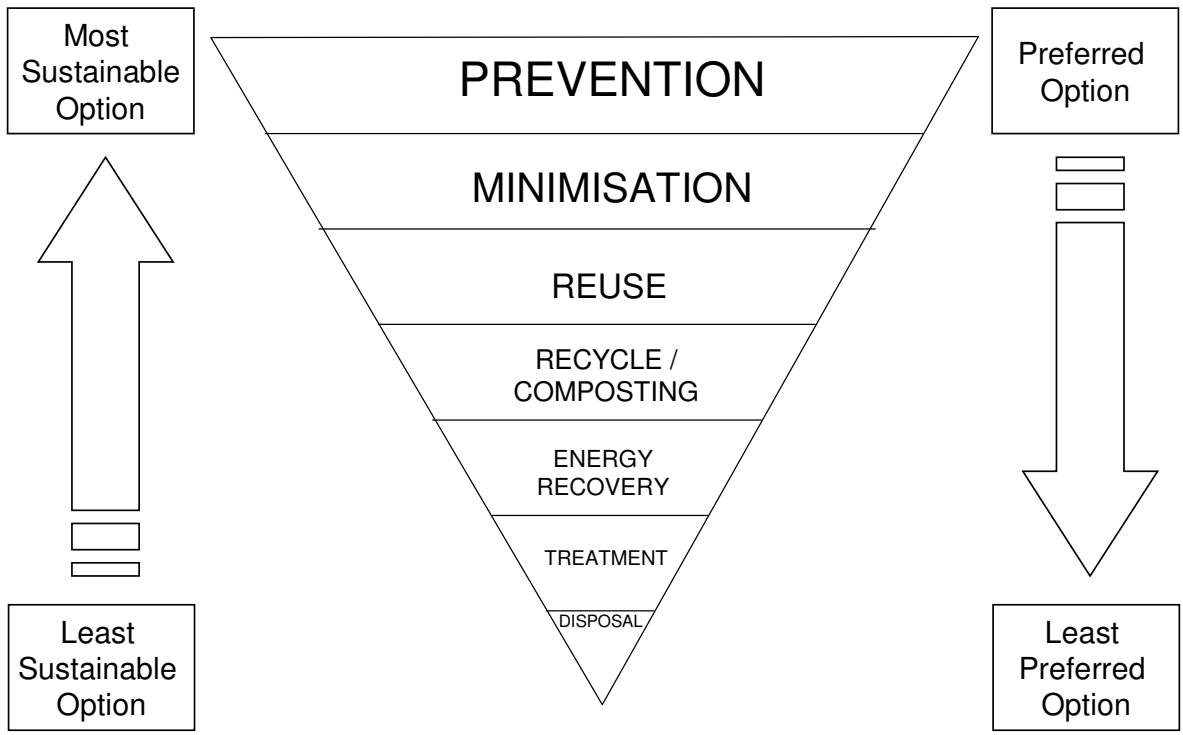
1 INTRODUCTION

This report forms a Technical Appendix to Chapter 14 (Soil and Water) of the Environmental Statement for Viking Wind Farm (Mouchel, 2009a) and should be read with reference to this chapter. This document should also be read in conjunction with the related Technical Appendix 14.6, Framework Environmental Management Plan / Pollution Prevention Plan (Mouchel, 2009b).

Viking Energy Partnership is currently progressing proposals for a wind farm on North Mainland in the Shetland Islands. The proposed wind farm site is located approximately 27km north of Lerwick and is roughly centred on the settlement of Voe (grid reference HU 4077 6320). The area of interest is divided into four quadrants, with two quadrants to either side of the main A970/A968 route which runs north–south across the island. The quadrants are known as; Delting, Collafirth, Kergord and Nesting. All four quadrants of the proposed 150-turbine wind farm comprise areas of open moorland used mainly for rough grazing.

Under the *Environmental Protection Act 1990*, producers of waste have a 'Duty of Care' to ensure that waste is properly managed. The 'waste hierarchy' (Scottish Environment Protection Agency, 2006a) identifies preferred to least preferred options as shown in Figure 1 below. As in all matters concerning waste, the legislative requirements and the 'waste hierarchy' have been used as the primary benchmarks when considering options for dealing with construction waste.

Figure 1: Waste Hierarchy



This is designed as a framework document providing a general outline of the contents and matters to be addressed by the final plan. The framework Site Waste Management Plan

(SWMP) will be made available to those tendering for the construction works, with the appointed principal contractor providing input and methods for implementation of the principles identified herein at the detailed design stage and producing the construction waste management plan. It is proposed that contractual documents include items relating to waste management, following similar guidelines to those applied by SEPA for environmental management (Scottish Environment Protection Agency, 2006b). All appointed sub-contractors will be fully briefed regarding the general site waste management strategy and applicable site-specific waste management measures.

As with any large scale construction project, the generation of waste from wind farm development is inevitable. However, the types and quantities of waste produced will be dependant on the local conditions and scale and type of development. Waste minimisation and disposal of generated waste, will be dependant on the location of the development and access to disposal facilities. Excavated material, such as peat and spoil from borrow pits can often be used for reinstatement and restoration, minimising the quantities of waste material and reducing the need for imported material to carry out reinstatement. There are now a significant number of wind farms in Scotland which have made their way through the planning process and are under construction or in operation. As a result, many of the issues regarding waste have been thoroughly debated and the best practicable environmental option (BPEO) for waste management identified.

Although, at present, SWMPs are not required in Scotland, since 2008 these have become a legal requirement in England and Wales for projects of the scale of Viking wind farm and the development and use of these plans is regarded as 'best practice' (Institute of Environmental Management and Assessment, 2008).

At this stage, the SWMP takes a strategic approach, identifying the major waste streams associated with the development and identifying appropriate routes for disposal. Note that estimated quantities of waste materials to be produced would be determined at the later detailed design stage, where sufficient information is available to facilitate this. Each contractor's waste management plan will be consistent with the strategy outlined in this document and will consider three elements as discussed in sections 1.1 to 1.3 below.

Following detailed design and prior to construction a wind farm SWMP will be produced. The SWMP will be submitted to the planning authorities, SEPA and other appropriate bodies for comment prior to implementation. Additional sections may be added following these consultations.

An Environmental Manager will be appointed pre-construction, the remit of this role will include waste management.

Information sources used for the development of this framework SWMP include:

- SEPA (jointly with Environment Agency and Northern Ireland Environment Agency) Pollution Prevention Guidelines (PPG);
    - PPG02 Above ground oil storage tanks
    - PPG04 Treatment and disposal of sewage where no foul sewer is available
    - PPG08 Safe storage and disposal of used oils
- IEMA Practitioner Series No.11: Waste Management: A Guide for Business in the UK.

1.1 Waste minimisation

Minimisation of waste can only be achieved by fostering a "waste aware" culture on site. To this end, appropriate training of all staff in the requirements of the waste management plan will be carried out. This training should also provide guidance to site staff on site tidiness, storage on site (including segregation, storage facilities and protection from the elements) and correct handling procedures.

A 'just in time' procurement philosophy for all materials to be used on site should be encouraged, as materials stored on site often are damaged or deteriorate, creating additional waste for disposal.

This approach can equally be applied to the contractor supply chain to ensure minimisation of packaging delivered to site and return of supplier's packaging materials in unloaded delivery vehicles.

1.2 Separation of waste at source

Storage facilities for wastes produced 'at source' (e.g. where packaging is unwrapped) will be designed to facilitate, where practical, the segregation of wastes to maximise the opportunities for reuse or recycling.

1.3 Appropriate storage and disposal

Storage facilities for waste will be consistent with legislative requirements and design criteria included in guidance. Disposal will be carried out using the best environmental option available. Disposal routes will be agreed in consultation with SEPA.

2 MANAGEMENT SYSTEMS AND ENVIRONMENTAL STANDARDS

Construction activities will either directly or indirectly result in the generation of waste materials. In line with the philosophy of the waste hierarchy, the preferred option is the prevention or minimisation of waste during this process. Other options such as reuse and recycling of waste need only then be considered for residual waste materials. Proper management of this process is critical in terms of ensuring that the quantity of waste generated is minimised, that the best option is identified for dealing with waste, and that the storage, handling, treatment and disposal of waste is managed in an environmentally responsible manner by everyone involved in the construction process.

It is widely recognised that the use of an environmental Management System (EMS), accredited to or meeting the requirements of ISO 14001:2004 demonstrates that an organisation has processes and systems in place to enable it to effectively manage its impact on the environment. It is expected that major contractors, particularly those engaged in environmentally sensitive operations, will be able to demonstrate effective environmental management through use of an EMS. Although evidence of an accredited EMS would be preferred, contractors who do not have an accredited system may be engaged subject to a satisfactory audit of their systems by Viking Energy Partnership or their nominated representative.

Contractors shall prepare an appropriate waste management plan, derived from the information produced in the ES and appropriate technical appendices and consistent with the strategy adopted in this document. These will be approved by Viking Energy and SEPA prior to commencement of work.

3 MANAGEMENT OF PEAT

During the construction process for the wind farm, significant volumes of peat will be extracted to facilitate construction of access tracks, compounds, turbine bases and hard standing areas. An estimate of the volume of peat to be extracted and potential reuse has been made and is described in detail in Technical Appendix 14.4 Peat Excavation and Potential Reuse (Mouchel, 2009c). While it is envisaged that surplus peat generated from the construction activities will be utilised for restoration, should this not be practical, waste management options will be discussed and agreed by Viking Energy and SEPA.

4 MANAGEMENT OF SILT AND SEDIMENT

The excavations required for turbine bases, and to a lesser extent road construction, will result in infiltration from direct rainfall, surface runoff and seepage. This infiltration will undoubtedly have entrained fine particles of peat and other fine particulate materials. This issue is considered in both Chapter 14 of the ES (Mouchel, 2009a) and in Technical Appendix 14.6 Framework Site Environmental Management Plan / Pollution Prevention Planning (Mouchel, 2009b). Appropriate control measures are recommended in these documents.

5 MANAGEMENT OF DOMESTIC WASTE

Although the site will not encompass any domestic properties, some waste materials generated at welfare facilities, will be consistent with those from of domestic properties. These types of waste can be considered as two distinct streams; domestic refuse and sewage.

5.1 Domestic refuse

This will primarily be food waste, paper, plastics, glass and other typically domestic refuse. All such waste will be stored in an appropriate location, protected from wind, rain and wild animals. Facilities will be provided to segregate waste into appropriate waste streams and minimise volumes of material stored (e.g. for cardboard waste; folding and/or use of balers). All waste will be transported from site at an appropriate frequency by a registered waste carrier to prevent overfilling of waste containment facilities and will be reused/recycled where practical.

5.2 Sewage

Disposal of sewage from the site will be carried out by methods recommended in PPG4. Further details are provided in Technical Appendix 14.6 (Mouchel, 2009b)

6 MANAGEMENT OF CONCRETE WASTE

As stated in Technical Appendix 14.6 (Mouchel, 2009b); a settlement and re-circulation system for water reuse will be considered for water used in concrete batching. Should this not be practical, waste water from concrete batching will be adequately treated to deal with suspended solids and high alkalinity before discharge.

7 MANAGEMENT OF WASTE OILS

Storage of waste oils will undertaken in line with guidance in PPG2 and PPG8. Liquid wastes will be removed at an appropriate frequency for disposal off site. Further details are provided in Technical Appendix 14.6 (Mouchel, 2009b). In particular, storage will be remote from water sources and supplies and suitable secondary containment will be provided. Plans will be developed and communicated for dealing with any potential spill.

8 MISCELLANEOUS WASTES

During the construction process, there will be a number of smaller waste streams. These may change in importance and occurrence during the construction process. The main streams to be considered include:

8.1 Packaging materials

These will include paper, plastics and wood used for packaging the turbine blades, motors and towers, cement, reinforcing rods and other raw materials. It is expected that these materials will be recyclable. Indeed, it is likely that these materials will have some commercial value (and may not therefore be classed as 'waste').

8.2 Waste metals

There is likely to be a quantity of scrap metal generated from items such as steel reinforcing rods for concrete. Again, these materials are expected to be recycled and to have some commercial value.

8.3 Cleaning Activities

Cleaning activities (e.g. for plant, vehicles) can produce volumes of polluted water. All cleaning activities must therefore be carried out in an appropriate enclosed area and waste water captured for treatment and appropriate disposal. Where practical, recycled water (sometimes known as 'grey water') should be used for cleaning purposes.

9 INSPECTION AND MAINTENANCE

A critical aspect in waste management is ensuring that the systems and facilities put in place for the management of waste function as designed and continue to do so throughout the life of the project. This can only be ensured by putting in place a programme of routine maintenance and inspection for storage facilities, pipework and pollution prevention systems. These will include:

- Waste storage areas and containers;
- Effluent treatment facilities;
- Oil separator systems;
- Bunds;
- Pipework;
- Notices.

It is recommended that a formal audit system is implemented to include all of the above items and also to confirm that procedures for dealing with waste are being followed by all site

personnel. To ensure that contractors adhere to their commitments, periodic site waste audits will be undertaken by the Environmental Manager (or appropriate delegated person) throughout the construction process.

10 RECOMMENDATIONS

This framework document provides guidance on the main issues to be dealt with during construction and operation. With decommissioning activities likely to be closely related to construction activities, the document will also provide a framework for waste management for decommissioning activities.

It is recommended that contract documentation explicitly includes a requirement for contractors to develop and implement best practice solutions for waste management in line with this SWMP.

During development of the SWMP, contact should be made with local waste management stakeholders including SEPA, Shetland Islands Council and Waste Aware Scotland to gain advice on best practice and local schemes. This consultation will enable the discussion and inclusion of additional features within the SWMP, as practicable.

11 REFERENCES

Institute of Environmental Management and Assessment (IEMA) (2008) – *Practitioner Series No.11 Waste Management: A Guide for Business in the UK*. Published by IEMA 2008.

Mouchel (2009a), *Viking Wind Farm Environmental Statement - Soil and Water (Chapter 14)*

Mouchel (2009b), *Viking Wind Farm Environmental Statement - Soil and Water (Chapter 14)*; *Technical Appendix 14.6 Framework Site Environmental Management Plan / Pollution Prevention Planning.*

Mouchel (2009c), *Viking Wind Farm Environmental Statement - Soil and Water (Chapter 14)*; *Technical Appendix 14.4 Estimated Peat Extraction and Potential Reuse*.

Scottish Environment Protection Agency (2006a), *The Waste Hierarchy* - http://www.sepa.org.uk/waste/moving_towards_zero_waste/waste_hierarchy.aspx (accessed *January 2009).*

Scottish Environment Protection Agency (2006b), *Prevention of Pollution from Civil Engineering Contracts: Special Requirements (and related Guidance document) - www.sepa.org.uk/water/water_regulation/guidance/engineering.aspx (accessed January 2009).*

We have used our reasonable endeavours to provide information that is correct and accurate and have discussed above the reasonable conclusions that can be reached on the basis of the information available.