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GENT FAIRHEAD & CO

RIVENHALL

CHP MANAGEMENT PLAN FOR PLUME ABATEMENT

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1 INTRODUCTION

1.1 Background

The original planning permission was granted on 02 March 2010 by the Secretary of State, following a Public Inquiry in September 2009, for an Integrated Waste Management Facility (IWMF) at Rivenhall Airfield, Essex, C5 9DF, in accordance with application reference ESS/37/08/BTE, dated 28 August 2008. This was subject to a number of conditions including condition 17 which states:

> "*No development shall commence until a management plan for the CHP plant to ensure there is no visible plume from the stack has been submitted to and approved in writing by the Waste Planning Authority. The development shall be implemented in accordance with the approved plan.*"

An amendment to the planning permission was granted on 26 March 2015 (ref: ESS/55/14/BTE). This included the same condition relating to the requirement to submit a management plan. This CHP Management Plan for Plume Abatement (referred to as the CHP Management Plan) has been developed to discharge the above planning condition.

The scheme has developed since the planning permission was originally granted with detailed work on the technological solution carried out. This Management Plan is based on the final technical solution which is the basis of an Environmental Permit application and the Section 73 application that has been recently submitted by Gent Fairhead & Co Limited to Essex County Council.

1.2 Objective

To develop a CHP Management Plan which would ensure that there would be no visible plume from the main stack of the Integrated Waste Management Facility to discharge condition 17 of the planning permission ref ESS/55/14/BTE.

2 MANAGEMENT PLAN

This CHP Management Plan has been developed as a tool for the operator to implement to ensure that there will be no visible plume from the main stack of the IWMF. The equipment needed to implement the procedures is contained in the design for the plant.

The measures proposed have been designed based on dispersion modelling using the ADMS model. Full details of the dispersion modelling results and justification that the proposed measures will prevent the formation of a visible plume can be found in the supporting technical report "Visible Plume Analysis".

2.1 Primary Measures

A feedforward mechanism will be used to adjust the temperature of the exhaust air from the pulp plant based on a set of meteorological parameters. A weather station will be installed which will automatically feed into the operating system. The following four operating conditions will be implemented for the emissions from the pulp plant:

(1) June to September – no additional heating – release at 30°C

(2) October to May – heating using low pressure steam – release at 130°C

(3) October to May – additional heating using high pressure steam – release at 210°C when the ambient temperatures is less than 4°C, wind speed is less than 9 m/s and the relative humidity is greater than 70%.

(4) October to May – additional heating using high pressure steam – release at 260°C when the ambient temperature is less than -1°C, wind speed is less than 8 m/s and the relative humidity is greater than 83%.

These four operating regimes provide a fairly coarse subdivision of the operating profile of the plume management system. This will be refined during the commissioning of the plant. The following table shows the number of residual plumes predicted to occur following the implementation of the above operating conditions.

Scenario	Average number of visible plumes per year	% of year a visible plume
Normal Operations	600	6.8%
Additional heating to 130°C – October to May	86	1.0%
Additional heating to 210°C – October to May when: Relative Humidity is greater than 70%; Temperature is less than 4°C; and Wind speed is less than 9m/s.	14.2	0.2%
Additional heating to 260°C – October to May when: Relative Humidity is greater than 77%; Temperature is less than -1°C; and Wind speed is less than 8m/s.	3.8	0.04%

2.2 Secondary Measures

Following implementation of the heating regimes listed above there may be a small number of visible plumes predicted to occur under certain weather conditions. The following table summarises the ambient conditions (which can be predicted and forecast) in which any residual visible plumes are likely to occur.

Table 2.1: Ambient conditions in which residual plumes may occur following heating to 260°C

	>0% chance of occurring	>50% chance of occurring
Phase 1 Only		
Temp <	-1°C	-9°C
Wind speed <	5 m/s	3 m/s
Relative humidity >	83%	83%
Number of hours over 5 years these conditions occur	965	15
% of time these conditions occur	2.20%	0.03%
Number of plume predicted to occur during these conditions	23	8

The greatest chance of a visible plume occurring for a set of meteorological conditions is when wind speeds are low and ambient temperatures are very low (sub zero). Following implementation of the heating of the exhaust air there is a greater than 50% chance of a visible plume occurring when temperatures are less than -9°C. However, the conditions only occur for 0.03% of the time and not in all years. Any residual plumes are predicted to occur between the hours of 1am and 1pm.

The probability analysis has shown that despite this reduced load residual plumes are predicted to occur when ambient temperatures are below -7°C, wind speeds are less than 1 m/s and the relative humidity is greater than 90%, between the hours of 1am and 1pm. Over the months of October to May (inclusive) the operator will analyse the 5 day weather forecast on a daily basis to determine if temperatures are predicted to fall below -7°C between the hours of 1am and 1pm. In the event that these conditions are forecast the operator will put in place the measures needed to bring dry fuel into the bunker. This dry fuel will then be fed into the bunker when the forecast predicts ambient temperatures are predicted to fall below -7°C.

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