1. Introduction

This application relates to a substantial variation application for a bespoke installation bioresources treatment permit for the Alfreton Sewage Treatment Works, operated by Severn Trent Water Ltd.

The site is currently permitted for the import of non-hazardous wastes for treatment within the wider sewage works. This permit will be merged with the installation permit.

This substantial permit variation application relates to the addition of a listed activity to the site, that of biological treatment of waste under the Industrial Emissions Directive. It relates to the non-urban waste water treatment directive (UWWTD) treatment of indigenous UWWTD derived sludge and imported UWWTD sludges from other works and cess and septic tank imported material which is of a similar composition. Note that these operations are currently operated at the site, under the UWWTD and The Controlled Waste Regulations 2012 (paragraph 3 exclusion). The anaerobic digestion process will require an extension to the current site boundary.

The listed activity starts from the point of the separation of the sludge from the main UWWTD treatment stream, through to its storage on the site cake pad, prior to its recovery to land offsite. The additional aspects of the permit includes the biogas handling and treatment system as a directly associated activity, including a biogas fuelled gas engine and boilers, covered by the Medium Combustion Plant Directive.

A bespoke installation permit is required for this site due to the site not meeting the standard rules infrastructure requirements.

A number of other activities are undertaken at the site, outside of the scope of this permit, relating to the treatment of sewage derived materials through aerobic processes. These activities are covered by the UWWTD.

1.1 Non-Technical Summary

This application is for a substantial variation to environmental permit EPR/GP3690CH (EAWML43529) under the Environmental Permitting (England and Wales) Regulations 2016 (as amended), following a change of interpretation of the Urban Waste Water Treatment Directive by the Environment Agency.

The current older style waste management licence (now environmental permit) for the site covers the import of suitable wastes to the site for treatment through the sewage works. The existing permit has three separate import points listed, with a single EWC list applying to all three points.

The anaerobic digestion process treats sewage sludge arising from the indigenous treatment of UWWTD derived materials supplied to the site by the sewer network and from tanker imports of waste materials to the works that are similar in composition to UWWTD derived materials. Indigenous sludge is mixed with imports of waste sludges from other sewage treatment plants and subject to biological treatment via anaerobic digestion within one of two anaerobic primary digester tanks located on site. Previously, sewage treatment sites operated by sewerage undertakers importing sludges and liquids were only regulated for the import and treatment of these materials to the wider site and indigenous sludges arising from the treatment of sewage was not required to be included in a permit. It has now been determined that the treatment of indigenous sludges do need to be permitted as they fall outside of the Urban Waste Water Treatment Directive (UWWTD).

This variation application is:

- To incorporate the addition of a new listed activity to the permit, that of biological treatment by anaerobic digestion, to make this an installation permit;
- To include with the permit 1x CHP units and 3x boilers. The CHP is classified as a 'new plant' and the boilers as 'existing plant' under the medium combustion plant directive (MCPD);

- To increase the overall waste throughput of the site to include both imported and indigenous derived sewage and similar wastes;
- To update the existing waste import permit to modern standards; and
- To amend the site boundary to include the area of the anaerobic digestion plant and directly associated activities.

The installation covers the biological treatment of sewage sludge, both indigenous and imported from other waste water treatment sites, in a mixture with imported cess and septic tank derived wastes, by anaerobic digestion, with a capacity above the relevant threshold. There are a number of directly associated activities, including the operation of one biogas fuelled CHP unit for the generation of electricity and heat at the site, which is classified as 'new plant' under the Medium Combustion Plant Directive. There is a second listed activity at the site relating to the operation of a liquor treatment plant at the site, for the treatment of dewatering liquors.

The site is located in a rural setting to the north of Alfreton on the outskirts of the town. The Alfreton Brook runs to the north of the site across agricultural land.

The waste activity comprises an offloading coupling for tankers and cess vehicles to discharge through, located at the pre-digestion tanks. All tanker imports are passed through a logger to record the incoming volume and the company carrying out the import. The import is temporarily held in a sludge tanker import storage tank and passes through grit and rag removal screens. Once the tanker waste has mixed with the incoming UWWTD material, its treatment falls outside the scope of the Environmental Permitting Regulations.

The installation is for the biological treatment of non-hazardous wastes by means of anaerobic digestion. It also comprises an import point for cess and septic tank imported materials from third parties to join the UWWTD route for aerobic treatment. This material is transferred with the indigenous sludge separated from the main aerobic treatment flow.

Indigenous sludges from the UWWTD route come from three pre-digestion tanks and tankered sludge imports enter from the tankered import storage tank and the rag and grit removal screens, prior to transfer to one of the two primary anaerobic digesters located at the site. Both digesters are above ground tanks and manufactured of concrete. The digesters both have external steel insulating skins, and operate on a batch process basis, that is incoming sludge is added to the process as digested sludge is removed. Removed sludge is transferred to one of four, above ground, concrete, open topped, post-digestion tanks to ensure that the required level of digestion is achieved. Following this, fully digested sludge is transferred to site dewatering equipment, where, following the addition of polyelectrolyte based coagulant, it is dewatered by centrifuge and stored on the sites open cake pad. The site has a secondary cake pad to use as additional storage for cake. Treated cake is removed from the pad for landspreading under the Sludge Use in Agriculture Regulations 1989, in accordance with the Biosolids Assurance Scheme (BAS).

Biogas is captured from the primary anaerobic digesters and stored within a telescopic roof biogas storage holder. The above ground biogas transfer pipeline is equipped with condensate pots that capture entrained moisture from the generated biogas and allow it to be drained into the site drainage system for treatment. The biogas storage vessel is fitted with pressure release valves as a safety precaution in the event of over pressurising the system.

The biogas is taken from the storage vessel for combustion in a 1.6MWth CHP engine which is a 'new plant' under the medium combustion plant directive. It generates electricity for use within the site and heat to maintain primary digester temperature. Biogas can also be used in three dual fuelled auxiliary boilers. In the event there is excess biogas, i.e. more than the CHP can utilise, or in the event that the CHP is unavailable, there is an emergency flare. This is utilised under 10% of the year.