Non Technical Summary

Introduction

Anglian Water (AWS) are in the process of upgrading their Sludge Treatment Centre (STC) at Whitlingham Wastewater Treatment Works (WwTW), Norwich. The upgrade includes the installation of a hydrolytic thermal pre-treatment plant, upstream of the existing anaerobic digesters. This process hydrolyses and pasteurises the sludge, maximising the pathogen kill and breaking down the organic content. As a result, the final cake product can be dried to achieve a higher percentage concentration of dried solids. The improved quality of the cake will allow a wider range of agricultural outlets, securing disposal for the foreseeable future. This improved sludge treatment stream has been sized to allow for expected growth within the WwTW catchment, in addition to increases in imported untreated sludge from satellite WwTWs within the area.

A major benefit of the improved anaerobic sludge digestion is the increased production of biogas, a valuable renewable energy resource with a high calorific value. The existing sludge digestion plant already produces biogas, which is used to generate power and heat, via a Combined Heat and Power Engine (CHP). The increased production of biogas will necessitate an additional CHP engine, effectively doubling the current onsite power generation. All the above works have been granted planning permission.

However, one consequence of the STC will be production of a more concentrated liquid effluent (known as a liquor) from the dewatering the digested sludge. Therefore, a means of treating the high strength soluble ammoniacal nitrogen (Amm N) and total phosphorus (TP) loads within the liquors will be required. Such treatment is not included in the development described above and which already has planning approval.

During the project preparation various treatment strategies were considered, the viable options included:

- tankering a percentage (approximately 60%) of the liquors to another local WwTW for treatment (i.e. Lowestoft), or
- providing a dedicated treatment process to individually treat the high strength ammoniacal nitrogen and total phosphorus in the digested sludge liquor stream.

The options to do nothing and/or upsize the existing biological wastewater treatment process were not considered in detail. This was because any attempt to process the substantially high ammoniacal nitrogen concentrations present in the new return liquor would produce high levels of nitrates in the main wastewater treatment stream; such levels would inhibit the level of phosphorus removal in the main treatment process. If this occurred the works would fail to meet the final effluent discharge consent standard, with respect to these parameters.

To do nothing or upsize the existing wastewater treatment facility were therefore discounted..

Following detailed analysis of the liquor treatment options, the most effective methods of treatment are to remove the phosphorus and ammoniacal nitrogen via separate processes. Ferric chloride dosing of the sludge would be adopted to treat the phosphorus; the facilities and structures required to implement this process does not form part of this assessment as it will be the subject of a separate planning application. However, the benefits arising from the ferric chloride dosing are taken into account when assessing the potential odour impacts as it is difficult to differentiate how one treatment process might affect odour risks from the other.

It is proposed that the ammoniacal nitrogen treatment will be a via a SHARON (Stable High Rate Ammonia Over Nitrite) plant and it is this treatment process which is assessed in this environmental statement, and for which a planning application is being submitted.

The improved STC, currently under construction, will commence operation by September 2008 and high strength liquor will be generated from this time onwards. In the short term, until a dedicated plant to treat the liquor is on stream, a proportion of the liquor will need to be tankered to Lowestoft WwTW for treatment, resulting in an additional vehicle tanker movements per day to and from the site.

Legislation, Policy and Planning

A range of European and UK legislative requirements have relevance to this project, In addition there are many policies adopted by local authorities which also affect the proposed development and which have to be accounted for in the planning process.

The proposed treatment of the liquor would meet the objectives of the relevant legislation, policies and guidelines as it will ensure a more sustainable treatment of sewage arising from the area. It will also ensure that the WwTW continues to meet the obligations and conditions imposed on AWS by pollution control legislation and the discharge consent for the works.

Air Quality During Construction

There will be a minimal amount of dust and vehicle exhaust fumes during the construction of the SHARON plant. The likelihood of dust is minor and would only be expected as a result of the excavation, foundation construction and landscaping operations. This would be reduced if construction takes place during the autumn or winter months. Mitigation methods with respect to construction are addressed by the Contractor (Black and Veatch) within their Project Environmental Plan and Project Environmental Risk Assessment.

Landscape and Visual Impacts

The proposed facility has a design and size similar to facilities existing on the site and as such will blend in well with the existing landscape. The potential impact of the new facility on the overall character of the site and landscape is expected to be similar to that of the existing treatment works. Considering it as an extension, the effects on the direct landscape are assessed as minor negative to neutral, as the existing site already comprises a large number of very similar buildings and structures.

The impacts on the wider visual landscape are expected to be neutral because the structures themselves will not dominate the current site in number and volume but tie in with its design and existing structures. The neutral impact is ensured as the proposed development will be partly surrounded by a planted bund, the edge towards the surrounding undeveloped areas will be smoother and less abrupt.

It is expected that the SHARON plant will require some artificial lighting. If construction takes place during the winter months, lighting of the site will be required during the darker working hours. During operation, some artificial lighting during darkness hours will be required for safe access and security. This will be in the form of low level illumination mounted on access areas to the individual items of plant. On demand directional lighting will also be installed for operational and maintenance access to plant areas and chemical storage. The impact of lighting during construction will be temporary in nature and not significant.

Ecology

Norfolk County Council requested that features of ecological interest to be considered in the EIA being birds, bats and reptiles. These species may be present in the land adjacent to the construction site although they are not present on the actual development site itself; this land has already been cleared and the topsoil has been stripped. The clearance of the site was conducted between September 2007 and February 2008 which is outside the breeding bird season. The clearance was also carried out in stages to encourage any reptiles to move out of the area. It is considered that bats may be present in some mature trees adjacent to the site, but as this EIA has been carried out in winter it has not been possible to conduct surveys for bat movement.

During construction of the facility there will be some noise, but this is considered unlikely to disturb of the ecological features of interest. The existing WwTW already generates some noise and the construction activities would not greatly add to this. The main potential impact from construction would be to reptiles moving onto the construction site, and then being injured or killed by machinery. However, this will be prevented by avoiding the creation of areas attractive to reptiles, for example, rubble piles.

During operation of the facility there will also be some noise but this is considered unlikely to disturb the ecological features as they already would already have become accustomed to the noise from the existing STW. The main impact during operation would be on any bats feeding and roosting in the area as the facility will need external lighting, however, this impact will be minimised by sensitive directional lighting design.

Overall, there are not considered to be any significant impacts on birds, bats or reptiles as a result of this development.

Odour

The potential malodorous gas emissions from the liquor treatment plant would come from ammonium gas and hydrogen sulphide. Ammonia gas has a relatively high concentration detection threshold compared with other odorous gases, and it disperses quicker to atmosphere than other odorous gases.

The other potential malodorous gas is hydrogen sulphide. However, a beneficial effect of dosing the digested sludge with ferric chloride (to bind the residual phosphorus) is that hydrogen sulphide is also bound to the sludge which reduces the potential for emissions in the dewatered sludge liquor.

Odour dispersion models predict that at the nearest sensitive receptors odour from the liquor treatment process will be undetectable

Noise

Adrian James Accoustics Ltd carried out a baseline survey of the site area. Noise information made available by the manufacturers of various parts of the plant were used in the assessment of the predicted noise levels that could be reasonably expected from the operations on site.

The results of an assessment showed that the noise at the closest sensitive receptors is dominated by road traffic noise from the A47. Noise from the existing WwTW was not audible or measurable at any of the monitoring locations. Calculated noise levels from proposed SHARON plant within the WwTW were found to be significantly below the background noise levels. This was true for both the existing works and proposed SHARON plant during the daytime and the quietest night time periods. Consequently, the assessment indicates that complaints would be unlikely following the proposed development.

The assessment of noise against guideline noise levels defined by the World Health Organisation found that the existing background noise levels exceed the criteria for serious annoyance during the day and evening periods, and for sleep disturbance during the night. This is due to road traffic noise from A47. The proposed development of the WwTW would not affect this.

An assessment of the change in noise corresponding with operating the SHARON plant and the additional sludge conveyor continuously over a 24-hour period indicates that there would be a negligible impact during the quietest night time period at the closest sensitive receptor. This is because the noise from proposed is significantly lower than the background noise at the closest receptor - which is dominated by road traffic noise from the A47.

Emissions to Water and Land

There are no anticipated discharges to water or land.