Development of Waste Treatment Facility, comprising Reception and Recycling Hall; Mechanical Biological Treatment (MBT) Facility; Advanced Conversion Technology (ACT) Facility; Power Generation and Export Facility; Education and Office Accommodation; Landscaping and, Access.

Sinfin Lane, Derby

Resource Recovery Solutions (Derbyshire) Ltd

Environmental Statement

Chapter 16:

Summary of Effects

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16 Summary of Effects

16.1 Introduction

16.1.1 This concluding section of the Environmental Statement draws together the results of the foregoing assessment. It describes the disciplines addressed, summarised how they have been assessed, summarises further mitigation measures required and recommended, and identifies the likely significant residual effects which conclude with the choice of the proposed Waste Treatment Facility (WTF) comprising Erection of Waste Treatment Facility, Reception and Recycling Hall; Mechanical Biological Treatment (MBT) Facility; Advanced Conversion Technology (ACT) Facility; Power Generation and export facility; Education and Office Accommodation; Landscaping; and Access within the administrative boundary of Derby City Council.

16.2 Traffic and Transportation

16.2.1 The traffic and transportation chapter contains an assessment of the Scheme upon the highway network and of the overall impact of traffic related to the development during its construction and operation.

16.2.2 The Sinfin WTFis located to the east of Sinfin Lane, which is a wide urban single carriageway road subject to a 30mph speed restriction along its length. Approximately 500m to the north of the site is a four armed signal controlled crossroads where Sinfin Lane forms the southern arm with the A5111 (east and west) and Balaclava Road. The A5111 varies between a single and dual carriageway route which routes east to west and provides a link between the A52 and the A6 to the east and the A38 to the west. It has street lighting and footways along its length. The A5111 is subject to a speed restriction of 40 mph within the vicinity of Sinfin Lane.

16.2.3 The existing traffic flows have been obtained for the length of Sinfin Lane between the A5111 and south of Wilmore Road. Four traffic surveys have been undertaken and an Automatic Traffic Count (ATC) has been obtained from DCC. The flows establish a baseline position against which the proposed development traffic can be assessed. A full summary of the traffic flows, including the peak hours, are set out in the appended Transport Assessment.

16.2.4 The proposed WTF has capacity to receive 200,000 tonnes of waste per annum with 190,000 tonnes per annum being residual waste. For a worst case assessment the trip generation has been based upon the 2011/2012 total waste projection data as enclosed in the appended Transport Assessment. The total waste inputs for 2011/2012 are estimated at 126,018 tonnes per annum. This includes 11,860 tonnes of bulker deliveries. The Waste Collection Authority

delivers the highest level of waste at 114,158 tonnes during this opening year of the proposed WTF compared with the following four years and therefore the site generates the highest level of traffic movements during this period.

16.2.5 The proposed WTF generates export vehicles resulting from the Advanced Conversion Technology (ACT) process. The process involves converting the imported waste to generate gas and renewable energy and therefore the volume of outputs is lower than the level of inputs. The proposed WTF generates export vehicles associated with the ACT relating to Recyclates. The waste projection data has been used to estimate the total number of waste vehicles for a typical day generated by the site.

16.2.6 Traffic Officers at Derby City Council identified Highfields Farm, Boulton Moor and Stenson Field as contributors to future year traffic flows the following three residential sites were recently granted consent at Public Inquiry. However, the full effects of the likely traffic flows on the adjacent highway network are not fully known and the Derby Area Transport Model is currently being re-run to include these three developments. Furthermore, Transport Officers at Derby City Council have advised that although these three developments are planned to come forward they are unlikely to start before the proposed opening year of this proposal (2011/12) and indeed, there is no guarantee will actually come forward at all.

16.2.7 The proposed WTF could generate approximately 118 vehicles on a typical day associated with waste inputs to the site; 54 of which would be HGVs and the remaining being small to mid sized vans and street sweepers. The exportation of recyclate or unaccepted waste from the WTF could generate 38 vehicles all of which are HGVs. On a typical day the proposed WTF could generate 368 two-way vehicle movements with 292 of these trips being HGV's with the maximum number of HGV trips being made between 1300hrs and 1400hrs. In terms of employee movements (factored up to include trips generated by visitors) 38 vehicle movements could be generated.

16.2.8 Operational assessments have been undertaken at the signal controlled junctions of Sinfin Lane/Wilmore Road and Sinfin Lane/A5111/Balaclava Road. These show that the proposed WTF generated traffic would have a negligible impact on the operation of the junctions in comparison to base flows during the network peak hours. In addition the proposed site access operates with the maximum recommended capacity. The site is located within an industrial area and is accessible via the principal road network and preferred HGV routes. The site is accessible for employees and visitors by sustainable modes of travel in particular by public transport and cycling. Personal Injury Accident (PIA) data demonstrates that there are no road safety issues within the vicinity of the site access.

16.2.9 The effect of road traffic as a result of the proposed WTF, or construction of, is not predicted to have any perceptible environmental effect. This is based on the assessment guidelines set out by the IEMA in their 'Guidance Note No. 1: Guidelines for the Assessment of Road Traffic'.

16.2.10 In light of IEMA Guidelines, the generated traffic would be of negligible significance and there is no need for any further mitigation measures. Notwithstanding this, this does not obviate the need for onsite management of HGV's existing the site, in particular in relation to dust and dirt. On site procedures such as washing down of wheels will prevent the occurrence of dust and dirt spreading from the site onto the adjoining road network. Such procedures will be undertaken on site and will remove the possibility of dust and dirt impacting upon the surrounding road network.

16.2.11 The assessments undertaken have demonstrated that the proposals would increase daily traffic flows along Sinfin Lane by only 2.2%.

16.2.12 In accordance with the IEMA guidelines, further more detailed assessments were undertaken and established that such increases are unlikely to create any perceptible effect upon the road network.

16.2.13 It is considered there will no perceptible environmental effect as a result of the proposed WTF

16.3 Air Quality

16.3.1 An assessment of the air quality effects associated with the Scheme has been undertaken. The assessment includes a description of the legislation and policy framework relating to air quality issues associated with waste facilities of this type. It also establishes the current air quality conditions within the study area and describes the methodology used to assess the air quality effects of the proposed facility.

16.3.2 There is the potential for air quality effects to arise from the construction of the scheme including construction-related traffic movements; and from the operation of the proposed facility, including traffic movements.

16.3.3 The Scheme will be designed to minimise pollutant emissions using the Best Available Techniques (BAT) and to ensure air quality effects from residual emissions are minimised by release through a stack of an appropriate height. The resulting likely effects on sensitive communities and ecological receptors have been assessed utilising dispersion modelling techniques in accordance with good practice. The effect of development related traffic

emissions on air quality has also been assessed, together with an assessment of the effects of odour.

16.3.4 Emissions from the proposed WTF have been assessed through detailed dispersion modelling following the Environment Agency's good practice guidelines. The assessment has been undertaken assuming a number of worst-case assumptions. This is likely to result in an over-estimate of the contributions that will arise in practice from the proposed WTF

16.3.5 The results of dispersion modelling reported in this assessment indicate that predicted contributions and resultant environmental concentrations of all pollutants considered are within the relevant air quality objectives and limit values.

16.3.6 With the stack emissions based on the worst-case, being at 100% of the EU Directive emission limit values, the assessment has shown that the combined with the traffic-related contributions the resulting ground-level annual mean PM_{10} concentrations are below the objective of 40 $\mu g.m^{-3}$ and do not lead to an increment that exceeds that of 1 $\mu g.m^{-3}$ recommended by DCC in its Supplementary Planning Guidance. For NO_2, the combined increase under theses worst-case conditions of 1.41 $\mu g.m^{-3}$ does exceed the 1 $\mu g.m^{-3}$ increment recommended by DCC, but in practice the increase is likely to be less than 1 $\mu g.m^{-3}$ as the Energos gasification process releases NO_x at about 40% of the EU Directive emission limit values. Overall, none of the objectives were exceeded.

16.3.7 Predicted concentrations of odour, bioaerosols, NH_3 and H_2S concentrations were all below their relevant air quality criteria and are unlikely to lead to significant effects.

16.3.8 Contaminants of potential concern (COPC) concentrations in the different receiving media were calculated from the particle-phase and vapour deposition to the soil. The estimated concentrations were based on a number of conservative assumptions to ensure that worst-case scenarios were assessed. Despite the numerous highly conservative assumptions, as discussed above, all hazard indices and cancer risks are well below their target levels. It is therefore unlikely that exposure to emission from the facility would cause an adverse health risk.

16.3.9 Overall the effects of the WTF are considered to be negligible to slight-adverse.

16.4 Landscape and Visual Impact

16.4.1 An assessment has been completed to identify the significance of the effect of the proposed facility on:

- The character of the landscape and its component features; and
- Views of the landscape that people experience.

16.4.2 The significance of a landscape or visual effect is a function of the sensitivity of the affected landscape and visual receptors, the magnitude of change that they will experience and the nature of the effect. Each development is evaluated in accordance to the proposals and the landscape and visual setting.

16.4.3 The significance of the landscape and visual impacts is determined by cross referencing the sensitivity of the landscape or visual receptor with the magnitude of change brought about by the proposals. Landscape and visual effects have been recorded as adverse, neutral or beneficial. Where the beneficial elements of the development offset the adverse elements, or where a significant change in the view is neither adverse or beneficial, the overall effect has been recorded as neutral. In determining the significance of residual effects all mitigation measures are taken into account.

16.4.4 The landscape assessment of the proposed development has shown that there will be no long term impact on the character of the area around the site. The proposals do not conflict with the character in either local or regional terms and have been shown to have little impact on the wider townscape.

16.4.5 The main factors affecting the visual assessment are the reintroduction of built form within the site and the impact of the development on the existing screening vegetation. The site has been shown to be visually contained by the high level of boundary vegetation and the urban context of the site itself. Many of the surrounding views are limited to upstairs windows due to garden vegetation and boundary fences screening ground floor living areas. This boundary vegetation helps to soften and filter views throughout the year.

16.4.6 The scheme introduces new built form and structures into an area of previously derelict land use.

16.4.7 The main impacts are:

- New main Waste Facility building;
- New Visitor/Education Centre;
- New site entrance off Sinfin Lane;
- Vehicle and pedestrian movement;
- New green areas for outdoor education and seating space;
- Enhanced boundary vegetation;
- New acoustic bund acting also as a screening divide.

16.4.8 Mitigating factors include Site design and landscape arrangements that will help screen closer range views, building design and appearance, distance of sensitive views from the development.

16.4.9 There will be an impact on the site vegetation due to changes in level and the need to create a new development platform for the proposals. Much of the boundary vegetation is associated with the adjacent railway cuttings and will be unaffected by the proposals. The site vegetation falls into two main types namely a herb layer, with intermittent scrub and small trees, and unmanaged self seeded trees and undergrowth. The main impact will be the removal of individual trees and areas of scrub within the site. The impacts are expected to range from No Effect on landform to Moderate Adverse on the existing site vegetation.

16.4.10 The development proposals will not impact on the wider character area of JCA 69: *Trent Valley Washlands.* The scheme is not anticipated to have a major impact on local character and has been assessed as having an impact of Slight Adverse in Year 1 reflecting the changes to Sinfin Lane and the character of the site itself in the short term.

16.4.11 It is anticipated that after 15 years there will be a range of impacts from No Effect to Moderate Beneficial resulting from the site boundary improvements and the opportunities for enhancement of the site through the landscape proposals. There will be 'No effect' on landscape character resulting from the proposals.

16.4.12 The visual effects of the proposals on Key Viewpoints and individual receptors are described within the Landscape and Visual Impact Tables contained within the Appendix. It must be noted that the selection of Key Viewpoints seeks to represent the views experienced by a range of visual receptor groups at specific locations from which the site is visible. The visual effects of the proposals are such that the resulting ZVI covers a high proportion of highly sensitive receptors such as residential areas and few lower sensitivity receptors such as places of work. The actual magnitude of change experienced by a given receptor group will determine the assessment at different locations and includes the numbers of viewers affected. The visual assessment necessarily under-represents those receptor groups of lower sensitivity, and those locations from which views of the site are to a large extent restricted.

16.4.13 In the first year (winter) it is anticipated that there will be a range of visual impacts resulting from the development. Viewpoints 4 and 7 will experience a Moderate/Slight adverse impact whereas the remaining viewpoints will experience a Slight adverse visual impact. The residential properties located in surrounding streets are predicted to experience a range of impacts from Slight to Moderate adverse. The properties expected to experience a Moderate

adverse impact are those located close to the site (Railway Cottages) or in an elevated location with open ground floor views in Osmaston Park Road, Victory Road and Dryden Street. Impacts of Moderate to Slight adverse are predicted from other public locations with the most significant being the predicted impact of Moderate Adverse from the allotments on Sinfin Lane. Local roads are anticipated to experience either a Slight adverse effect or No Effect.

16.4.14 It is anticipated that after 15 years the visual impact of the development will be significantly reduced by the proposed mitigation measures. By Year 15 the selected viewpoints will experience either No Effect or a Slight Adverse effect which is expected to reduce over time as the vegetation matures. Following mitigation all of the residential properties are predicted to experience an impact of Slight adverse although this is expected to reduce over time as the vegetation matures and the buildings become a familiar part of the overall townscape. Local roads are predicted to have no residual impacts.

16.4.15 In summary, the proposed development has been shown to have low residual townscape and visual impacts.

16.4.16 The landscape proposals are in accordance with the local landscape planning framework in terms of mitigation of the scheme and enhancement of the existing situation. The scheme does not have impacts on any townscape designations.

16.4.17 In visual terms, the site has been shown to be well screened and largely appropriate to the local visual context due to the extensive boundary vegetation screening and the scale of development directly adjacent to the site boundaries. The site can absorb a degree of change due to the well-developed northern site boundary vegetation, the local topography and the existing redundant commercial land use. The proposals utilise elements of the existing site, including topography and boundary vegetation, to integrate the scheme into the surrounding urban context without significant visual impacts other than on site boundaries in the short term.

16.5 Ecology and Nature Conservation

16.5.1 The method used for assessing the potential impacts on features of nature conservation build on those set out in the Institute of Ecology and Environmental Management (IEEM) Guidelines for Ecological Impact Assessment in the United Kingdom (IEEM, 2006). The ecological baseline conditions are first described and evaluated. The potential implications of the Scheme proposals to ecology and features of nature conservation importance are then outlined, and their significance assessed. Appropriate mitigation measures are recommended

where practicable to avoid or offset potential adverse impacts of the proposals. Additional enhancement measures are also described that would benefit nature conservation.

16.5.2 To inform the ecological evaluation of the Site and to determine what impacts the proposed WTF may have on the ecological value of the Site and its surroundings, a desk study, Phase 1 Habitat Survey and Protected Species Audit were undertaken between May 2007 and January 2009.

16.5.3 Relevant statutory and non-statutory organisations were contacted in January 2009 for information on designated sites of nature conservation importance, and habitats and species for importance to nature conservation. The aim of this exercise was to supplement the field survey results by collating and reviewing ecological information relevant to the site and the local area.

16.5.4 Impacts on the ecology and nature conservation value of the sites associated with the development can be divided into two main types: direct and indirect.

16.5.5 Direct impacts occur when a habitat or species is affected by the development itself, and any effects can be attributed to the development in a straightforward way. For example, actual damage or habitat loss, or similarly injury or mortality of a species caused by development works would constitute a direct impact. The removal of vegetation to accommodate the energy from waste recovery plant will constitute a direct impact.

16.5.6 Indirect impacts may occur when habitats or species are remotely affected, or when factors that relate to the development, but are not actually part of the development itself, influence ecology or features of nature conservation value. An example would be increased disturbance to animals during the construction phase or effects of air quality on nearby designated sites.

16.5.7 The proposed development will result in the loss of the majority of the terrestrial habitat present within the proposed site with only small areas of boundary scrub able to be retained. The residual impacts of both the construction and operational phases are set out in Chapter 9, Table 9.3. The significance of identified impacts on individual habitats is generally at site level, but the loss of habitats in combination is considered to of minor significant in a local context.

16.5.8 Off-site there is an extensive area of dense scrub habitat on the railway embankment beyond the northern site boundary which will be retained and protected during construction with only a localised loss of a few edge shrubs that encroach into the application site. Impacts on species and species groups during the construction phase (primarily relating to habitat loss) have been

predicted to be of significance at the level of the site only (Minor significance). Identified mitigation measures (Chapter 9, Table 9.2) will be undertaken at both construction and operational stages to avoid any adverse impacts.

16.5.9 Mitigation measures include: the protection of the Local Wildlife Site during construction phase through the implementation of a temporary surface water intercept system and good working practices including fencing to avoid disturbance of habitats outside the application boundary. Other mitigation measures include the protection of retained habitat and avoidance of clearance works at sensitive times of year (bird nesting season). Systematic vegetation clearance will be undertaken to allow the dispersal of mobile species at the outset of construction.

16.5.10 Compensation for the unavoidable habitat loss will be achieved through new structural tree and shrub planting on the northern and southern boundaries of the application site and through the creation of wildflower rich grassland. The new habitats will comprise native tree species by a range of shrub species that are appropriate for the soil type and location which will significantly increase the diversity of woody species.

16.5.11 In terms of enhancement hedgerows will be created on the southern and eastern site boundaries to provide an additional resource and provide connectivity around the perimeter of the site which will continue to be able to function as a corridor for the movement of wildlife.

16.5.12 The site has been subject to an infestation of Japanese knotweed, a highly invasive non-native plant species. A programme of herbicide treatment will be completed with the short term objective of eradication of the plant from the site and the immediate surroundings.

16.5.13 Artificial boxes will be provided for nesting birds, roosting bats and invertebrates will be provided in and adjoining the application site to help bring about biodiversity benefits as a result of the development.

16.5.14 The protection of the railway embankment scrub will maintain an existing wildlife corridor alongside the development and reduce potential impacts on species that move through the existing site and surrounds.

16.6 Hydrology and Flood Risk

16.6.1 As a matter of best practice, this assessment has been undertaken based on the relevant guidance on hydrology and flood risk assessment. This includes:

- Planning Policy Statement 25 (PPS25): Development and Flood Risk.
- East Midlands Regional Plan (March 2009).
- Derby County Council Plan 2005-09 and 2008-2009; and
- City of Derby Local Plan Review.

16.6.2 An assessment of the baseline conditions on Hydrology and Flood Risk has been undertaken for the proposed development of the assessment site. This assessment has been based on a review of available and collated information, and consultation with regulatory authorities. This includes a review of the Flood Risk Assessment completed for the Assessment Site.

16.6.3 Three main effects have been considered in the assessment – that on surface water quality, on surface water and flood risk and on water resources. Committed enhancement measures are outlined to reduce the impact from these effects. These include reference to a conceptual surface water drainage strategy for the attenuation of runoff rates from the site and also including measures to prevent an adverse impact on surface water quality. Reducing the significance of these effects would require further liaison with the Environment Agency and Severn Trent Water, notably with the detailed design of the conceptual surface water drainage strategy.

16.6.4 The identification and evaluation of likely significant effects after incorporation of enhancement measures have also been outlined. The significance of the effect on surface water quality was found to be minor in the local area, although moderate to minor in the surrounding catchment. The duration of effects under normal circumstances are not likely to be more than short to medium-term and of a temporary nature. The significance of the effect on surface water and flood risk was found to be minor in the local area and in the surrounding catchment. The duration of effects under normal circumstances are not likely to be more than short-term and of a temporary nature. It was assumed that the existing water supply, surface and foul water infrastructure can be used, and that it is adequate for the proposed development, no incorporated enhancement water resources measures are required to reduce the significance.

16.6.5 Additional mitigation measures are provided for surface water quality and surface water and flood risk, notably during the construction phase through the introduction of a Construction Environmental Management Plan and during the operation phase with a Management Plan for the surface water drainage strategy. The residual impact after inclusion of these mitigation measures was assessed, with all effects reduced to negligible – except the possibility of a

minor significance effect on surface water quality in the rare event of a major accidental spillage.

16.7 Hydrogeology and Ground Contamination

16.7.1 An assessment has then been undertaken to ascertain whether, and to what extent, the proposed development, site users and the environment will be impacted by ground conditions, most notably contamination resulting from historical, current or the proposed land-use.

16.7.2 The significance of contamination identified on site is assessed by identifying pollutant linkages using a Source-Pathway-Receptor approach, an approach underpinned by current UK Guidance, notably Part IIA of the Environmental Protection Act 1990.

16.7.3 The nature and significance of potential impacts are assessed against pre-determined baseline conditions for the site (Chapter 11, Sections 11.3 & 11.4). The assessment largely relies on the available published results of previous investigations and assessments that pertain to the site.

16.7.4 Impacts associated with the operation of the proposed facility were also considered and assessed. The potential impacts identified include vehicle spillage and the onsite storage of chemicals. The assessment concluded that subject to the implementation of appropriate mitigation measures and controls, the development proposals do not represent an unacceptable contamination risk.

16.7.5 The project includes a range of measures to avoid adverse effects during construction including the adoption of human health risk assessments (HHRA), earthworks methodology and construction management plan. This will ensure that effects are minimised during the construction phase. It is considered that there will be no significant impact upon the geology or hydrogeology once the facility is operational.

16.8 Noise and Vibration

16.8.1 There is the potential for noise and vibration effects to arise from the construction of the Scheme, together with construction-related traffic movements and noise effects from the operation of the proposed facility including traffic movements. There are a number of potential noise sensitive receptors (NSRs) in the area. Properties on Sinfin Lane, Caxton Street, Dryden Street, Kitchener Avenue, Victory Road, Thackeray Street and Osmaston Park Road are all located within 350 metres of the proposed WTF.

16.8.2 The noise assessment methodology requires a comparison to be made between the existing daytime and night-time noise environments at the noise sensitive receptors NSRs and the future noise levels that would be expected to occur, at these locations, with the facility being constructed and then operated. Existing noise levels were determined by a field study.

16.8.3 Planning Policy Guidance (PPG) 24 cites the use of BS 4142 to assess noise from proposed industrial and commercial premises affecting residential areas. BS 4142 requires a *'representative background noise level'* to be adopted for the assessment of noise effects during the operation of the facility. The approach adopted for this project, was to use the average L_{A90} for the daytime period between 07:00 and 23:00 hours and the night-time period between 23:00 and 07:00 hours, i.e. the arithmetic mean of the 15-minute data from the long term surveys within the appropriate time period.

16.8.4 The assessment also considered the changes in ambient ($L_{Aeq,T}$) noise levels during the construction and operation of the facility. These assessments have used the logarithmic average of the 15-minute L_{Aeq} between 07.00 and 19.00 hours, 07.00 and 23.00 hours and 23.00 and 07.00 hours for the assessments of noise during construction, daytime operation and night-time operation, respectively.

16.8.5 Only data measured when the wind speeds were at or less than 5 m/s were included in the datasets used to derive the baseline noise levels. BS 4142 implies that measurements can be taken in wind speeds up to 5 m/s, i.e. it states *'For the purposes of this standard, windshields are generally effective up to wind speeds of 5 m/s*'. It was considered that, by only using data obtained when wind speeds are at or less than 5 m/s, data will be obtained that is robust and valid in accordance with BS 4142.

16.8.6 Noise levels due to the construction phase have been predicted using SoundPLAN noise modelling software, which implements the methodology contained with BS 5228-1 [9], with the source terms obtained from BS 5228-1 on a list of plant provided by the client. Noise levels arising from the operation of the facility were predicted using SoundPLAN noise modelling software, implementing the methodology contained within ISO 9613-2 [11], with the source terms for the most significant items of external plant provided by Energos and Entsorga. The operational effects of static sources has been assessed using the methodology contained within BS 4142, which states that if the rating level from a facility exceeds the background noise level by 5 dB then this is of 'marginal significance'. Consideration has been given to sleep disturbance criteria as contained within 'Guidelines for Community Noise Levels' (GCN) [12], which states:

'If negative effects on sleep are to be avoided the equivalent sound pressure level should not exceed 30 dBA indoors for continuous noise'; and

'It should be noted that it should be possible to sleep with a bedroom window slightly open (a reduction from outside to inside of 15 dB).'

16.8.7 Vibration levels arising from the construction phase have been predicted using methods contained within BS 5228-2 [10]. Significant operational vibration effects are unlikely and, therefore, a quantitative assessment was not required.

16.8.8 Significant construction activities are proposed to be undertaken during the daytime. The construction of the development may require a concrete pour associated with the construction of the foundations that may require 24 hour working. Earth working, piling, night-time concrete poring and building works during the construction phase that are representative of the periods for which there is the greatest potential for significant noise effects to occur and have been considered quantitatively.

16.8.9 The results of the assessment indicate that significant adverse noise effects are not expected to occur at the majority of NSRs during the construction of the proposed facility. The results of the assessment indicate that significant adverse noise effects may occur at Railway Cottages during the periods of earthworks and piling and at Kitchener Avenue during night-time concrete pouring. Operational noise effects are considered to be major adverse at Railway Cottages, Etla and Alma, Sinfin Lane; and at Caxton Street and not significant at the remainder of NSRs.

16.8.10 In order to reduce the overall noise and vibration impacts on NSRs from identified significant noise effects, a number of mitigation measures are proposed. On the basis that the recommended mitigation measures are incorporated and provided that the construction of the facility is undertaken in accordance with Best Practicable Means and the operational facility includes appropriate noise mitigation at source, significant adverse noise or vibration effects would not be expected to occur at sensitive receptors during either the construction or operational phases of the facility.

16.9 Socio Economic Impacts

16.9.1 The Environmental Statement has assessed the potential social and economic effects of the Scheme. It describes the potential community and social effects of the proposed Waste Treatment Facility. A full description of the site and the proposed development is included in Chapter 4. The assessment was carried out in accordance with the relevant guidance, using data from the 2001 Census and other sources.

16.9.2 The proposed development is typical of other WTF, and of many infrastructure projects generally, in having a high capital cost but only moderate benefits in terms of employment in the construction stage and slight benefits in terms of employment in the construction stage and slight benefits in the operational stage.

16.9.3 Social and economic effects are unlike most other topics addressed in environmental statements in that they deal to a great extent with matters of human behaviour where individual choice is exercised. It is not possible for example to predict with any degree of accuracy who will benefit from the likely employment created by the proposed development at either the construction or operational stage – whether jobs will be taken by people in the local area (represented here by Sinfin Ward) or whether the impact will be diffused over much of the District and the area around it.

16.9.4 It is concluded overall that the proposed development will have beneficial effects on the socio-economic structure of the Catchment Area and the Region, and as such there is no requirement for any mitigation measures.

16.10 Cultural Heritage

16.10.1 This chapter assesses the likely effect of the implementation of the proposed development on cultural heritage in terms of archaeology, built heritage and the historic landscape. The likely impacts are assessed during both the construction and operational phases of the proposed development.

16.10.2 The aims of this study are to assess the likelihood of the proposed development site and study area to contain remains of cultural heritage significance and to provide an indication of what, if any, further work may be required with regard to mitigation.

16.10.3 The objectives of the project have been:

- to identify and assess the relative importance of cultural heritage features likely to be affected by the proposed development;
- to protect those features through the avoidance of direct impacts where possible and to design mitigation measures to preserve those features by record where avoidance is not possible, and;
- to protect the setting of cultural heritage features though both the design of the layout of the scheme and through measures such as planting.

16.10.4 The effect, if any, of the proposed development on below ground archaeological remains within and immediately surrounding the proposed development area has been considered. In

addition, consideration was given to information on Scheduled Ancient Monuments, Registered Parks and Gardens and Registered Battlefields, Conservation Areas, Listed Buildings and historic landscapes from a wider area so that the effect, if any, of the proposed development on their setting could be considered. An iterative approach has been taken, based on any likely impact on their setting.

16.10.5 Available evidence suggests that the proposed development area is located in a landscape that has seen little activity until the mid-19th century. Since that time the ground surface over the entire site has been subject to medium to very high levels of disturbance, and more recently utilised as a landfill site.

16.10.6 It is concluded that the proposed development area has low potential for the survival of below-ground archaeological remains. It is recommended, therefore, that no other further action be taken with regard to below ground archaeology in connection with the proposed development.

16.10.7 There are no statutorily designated sites (e.g. Scheduled Monuments, Listed Buildings) within the application site, the closest statutorily protected cultural heritage receptors being three Grade II listed buildings situated along Village Street in Normanton, the settings of which will not be affected by the proposed development.

16.10.8 There will be no effect on any other listed building, or its setting. No registered parks and gardens, historic battlefields or conservation areas, or their settings, will be affected by the proposed development.

16.10.9 It is recommended that no further action need be taken with regard to below ground archaeology. Given that there will be no effect on the setting of any protected cultural heritage feature, there is no requirement for any specific mitigation. There will be no residual impacts with regard to archaeology and cultural heritage.

16.11 Amenity

16.11.1 The potential adverse impacts on the local amenity from litter, pests and vermin can be adequately mitigated using standard procedures associated with good waste management practice. These standard procedures will form part of the environmental management system for the application site.

16.11.2 The residual amenity impacts in relation to litter, pests, vermin and birds directly associated with the proposal site will be of minor significance.

16.11.3 In addition, the move to WTF will reduce the scope for litter, flies, rat and seagull nuisance to be caused at landfill sites within Derbyshire that are currently managing this waste stream. The proposed facility at Sinfin Lane will therefore have no more than slight (adverse) significance to the immediate environment and a minor beneficial effect within the Derbyshire area.

16.12 Summary of Residual Impacts

16.12.1 The following table (Table 16.1) summarises the residual environmental impacts that may result from the proposed development. The identification of impact, whether adverse or beneficial, of minor, moderate or major significance is a professional judgement based on the authors experience and knowledge and the guidelines relevant to assessment methodology for individual topics.

Table 16.1: Summary of Residual Impacts

Topic	Phase	Impact	Impact Type	Magnitude	Significance	Geographical Level of Importance of Issue				
						I	N	R	D	L
Traffic	Construction	Increase in Traffic Flows	Medium	Minor	Negligible					*
		Visual Effects	Medium	Minor	Negligible					*
		Severance	Medium	Minor	Negligible					*
		Driver Delay	Medium	Minor	Negligible					*
		Pedestrian Delay/Amenity	Medium	Minor	Negligible					*
		Accidents and Safety	Medium	Minor	Negligible					*
		Hazardous Loads	Medium	Minor	Negligible					*
		Dust and Dirt	Medium	Minor	Negligible					*
	Operation	Increase in Traffic Flows	Medium	Minor	Negligible					*
		Visual Effects	Medium	Minor	Negligible					*
		Severance	Medium	Minor	Negligible					*
		Driver Delay	Medium	Minor	Negligible					*
		Pedestrian Delay/Amenity	Medium	Minor	Negligible					*
		Accidents and Safety	Medium	Minor	Negligible					*
		Hazardous Loads	Medium	Minor	Negligible					*
		Dust and Dirt	Medium	Minor	Negligible					*
Air Quality	Construction	Construction Dust	Adverse	Extremely Small	Negligible					*

Topic	Phase	Impact	Impact Type	Magnitude	Significance	Geographical Level of Importance of Issue				
		Air Quality Effects from Construction Traffic	Medium	Extremely Small	Negligible					*
	Operation	Operational – Phase Stack Effects	Medium	Extremely Small - Small	Negligible – Slightly Adverse			*	*	*
		Operational-Phase Traffic Effects	Medium	Extremely Small	Negligible				*	*
		Operational-Phase Stack and Traffic Effects Combined	Medium	Extremely Small	Negligible				*	*
		Operational-Phase Stack and MBT Effects	Medium	Extremely Small	Negligible					*
		Operational Phase MBT Effects	Medium	Extremely Small	Negligible					*
Landscape and Visual Impact	Construction	Landscape	Adverse	Low-Medium	Slight-Moderate					*
		Visual Amenity	Adverse	High-Low	No effect-Substantial					*
	Operation Yr0	Landscape	Adverse	Negligible-Medium	No effect-moderate					
	Operation Yr0	Visual Amenity	Adverse	Low-High	Slight-Moderate					*
	Operation Yr15	Landscape	Beneficial	Negligible-Medium	No effect-moderate					*
	Operation Yr15	Visual Amenity	Adverse	Negligible-Medium	No effect-Slight					*
Ecology	Construction	Melbourne Junction LWS	Neutral	Negligible	Not significant					*
		Scrub and semi-mature trees	Adverse	Minor negative becoming neutral and minor positive	Both adverse and positive impacts are at a Site Level					*
		Neutral grassland	Adverse	Minor negative, becoming neutral with a potential long term positive	The adverse impact is at a local level and the positive impact also has the potential to be at the local level					*
		Tall ruderal and bramble	Adverse	Minor negative	Site Level					*

Topic	Phase	Impact	Impact Type	Magnitude	Significance	Geographical Level of Importance of Issue				
		Ephemeral vegetation	Neutral	Negligible	Not significant					*
		Off-site habitats (scrub)	Adverse	Minor negative	Site Level					*
		Bats (foraging)	Adverse	Minor negative	Site/Local					*
		Breeding birds	Adverse	Minor negative becoming negligible	Site Level					*
		Invertebrates	Adverse	Minor negative becoming negligible	Site Level					*
		Invasive weeds (Japanese knotweed)	Beneficial	Minor positive	Site – Local Level					*
	Operation	Melbourne Junction LWS	Positive	Minor – moderate positive	Local - County				*	
		Scrub and semi-mature trees	Neutral/ beneficial	Minor negative becoming neutral and minor positive	Both adverse and positive impacts are at a Site Level					*
		Neutral grassland	Neutral, potentially beneficial	Minor negative, becoming neutral with a potential long term positive	The adverse impact is at a local level and the positive impact also has the potential to be at the local level					*
		Tall ruderal and bramble	No additional impact							*
		Ephemeral vegetation	No additional impact	Minor negative						*
		Off-site habitats (scrub)	Adverse	Minor negative	Site level					*
		Bats (foraging)	Adverse	Minor negative	Site level/not significant following establishment of new habitats					*
		Breeding birds	Neutral	Minor negative becoming negligible	Not significant					*

Topic	Phase	Impact	Impact Type	Magnitude	Significance	Geographical Level of Importance of Issue				
		Invertebrates	Neutral	Minor negative becoming negligible	Not significant					*
		Invasive weeds (Japanese knotweed)	Beneficial	Minor positive	Site – Local Level					*
Hydrology	Construction	Surface Water Quality	Adverse	Low to Medium	Negligible - Minor				*	*
		Surface Water and Flood Risk	Adverse	Low	Negligible					*
		Water Resources	Adverse	Low	Negligible					*
	Operation	Surface Water Quality	Adverse	Low	Negligible					*
		Surface Water and Flood Risk	Adverse	Low	Negligible					*
		Water Resources	Adverse	Low	Negligible					*
Hydrogeology & Ground Conditions	Construction	Disturbance of residual soil / groundwater contamination, resulting in reduced water quality in perched waters in Made Ground	Adverse	Low	Negligible					*
		Impact on controlled waters by reduced water quality in perched waters in Made Ground as a result of disturbance of residual soil / groundwater contamination.	Adverse	Low	Minor					*
		Reduced water quality in controlled water by preferential pathways produced from foundation solution (i.e. piling)	Adverse	Low	Negligible Minor					*
		Impact on human health by short term exposure to contaminated waters in Made Ground.	Adverse	Medium	Minor					*
		Impact from accidental spillage of contaminants	Adverse	Low	Negligible Minor					*
		Impact on groundwater levels and flow resulting from building foundations, pavements and hard standing.	Adverse	Low	Negligible					*
	Operation	Impacts of potential vehicle spillage	Adverse	Low	Negligible					*
		Impacts of chemical storage	Adverse	Low	Minor					
		Impacts from buildings foundations, pavements and hard standing	Adverse	Low	Negligible					*
		Impacts of ground gas on site users	Adverse	Negligible	Negligible					*

Topic	Phase	Impact	Impact Type	Magnitude	Significance	Geographical Level of Importance of Issue				
		Impacts on groundwater flow	Adverse	Low	Negligible					*
Noise & Vibration	Construction	Noise	Adverse	Not significant	Neutral					*
		Vibration	Adverse	Not significant	Neutral					*
	Operation	Noise	Adverse	Not significant	Neutral					*
		Vibration	Adverse	Not significant	Neutral					*
Socio-Economic	Construction	Employment generation	Beneficial	Minor	Slight Beneficial				*	
	Operation	Employment generation	Beneficial	Minor	Slight beneficial				*	
		Economic Multiplier	Beneficial	Minor	Slight beneficial				*	
		Landfill Diversion	Beneficial	Minor	Slight beneficial			*	*	*
		Education Centre	Beneficial	Minor to Moderate	Slight beneficial				*	
		House prices	No Change	No change	Neutral					
Archaeology	Construction & Operation	Buried Archaeology Remains	Neutral	No Change	No Change			*	*	*
		Scheduled Ancient Monuments	Neutral	No Change	No Change		*			
		Historic Buildings	Neutral	No Change	No Change			*		
		Historic Landscapes	Neutral	No Change	No Change		*			
Amenity	Construction	Litter	Adverse	No Change to Negligible	Neutral to Slight Adverse					*
		Vermin and Other Pests	Adverse	No Change to Negligible	Neutral to Slight Adverse					*
		Mud Deposited on Highway	Adverse	No Change	Neutral to Slight Adverse					*
	Operation	Litter	Adverse	No Change	Neutral					*
		Vermin and Other Pests	Adverse	Negligible	Neutral					*
		Mud Deposited on Highway	Adverse	No Change	Neutral to Slight Adverse					*

Key: I: International N: National R: Regional D: District L: Local

16.13 Summary of Recommended Mitigation Measures

16.13.1 The following table (Table 16.2) summarises the mitigation measures (additional to those incorporated within the development proposals) recommended as a result of the impact assessments.

Table 16.2: Summary of Mitigation Measures

Topic	Phase	Detail	Recommended Mitigation
Traffic	Construction & Operation		None Required
Air Quality	Construction	Site Planning	Identify responsible person in charge
			Erect Solid Barriers to site boundary
			No bonfires
			Plan site layout - machinery and dust causing activities should be located away from sensitive receptors
			Hard surface site haul roads where practicable
		Demolition Works	Use water as dust suppressant
			Cutting equipment to use water as suppressant or local exhaust ventilation systems
			Securely cover skips and minimise drop heights
			Wrap buildings to be demolished
		Construction Traffic	All vehicles to switch off engines – no idling vehicles
			Effective vehicle cleaning and specific fixed wheel washing on leaving site
			All loads entering and leaving the site to be covered
			No site runoff of water or mud
			All non road mobile machinery (NRMM) to use ultra low sulphur tax exempt diesel (ULSD) where available
			On road vehicles to comply with set emission standards
			Hard surfacing and effective cleaning of haul routes, where practicable, and appropriate speed limit around site
		Site Activities	Minimise dust generating activities
			Use water as dust suppressant where applicable
			Enclose stockpiles or keep them securely sheeted
			If applicable, ensure concrete crusher or concrete batcher has a permit to operate
	Operation	Ground-level concentrations of pollutants	Ground-level concentrations of pollutants from the operational-phase of the Facility (stack and MBT) have been shown by the assessment to meet all the relevant air quality acceptance criteria. No further mitigation is required other than that incorporated into the design of the scheme. The operation of the facility will be strictly controlled though conditions attached to the Permit that will be required under the Environmental Permitting Regulations and will be enforced by the EA.
		Operational Traffic	No additional mitigation measures are necessary, although adoption of good practice is encouraged.

Topic	Phase	Detail	Recommended Mitigation
Landscape and Visual Impact	Construction & Operation	Strengthening of Boundary Planting	Boundary tree planting will be enhanced by the addition of new native trees to reinforce the boundary screening. Some existing trees along the boundary, mainly close to the railway embankment on the north side of the site will be retained and managed to achieve sufficient height to largely screen the waste facility buildings. The new planting will enhance this boundary screening by introducing trees which will create a screen at a domestic scale, replacing existing self seeded trees which have become 'drawn' as they compete for light and space against the other shrubs and scrub along the boundary. The existing screening will be maintained along the northern boundary which runs along the main railway line. On the southern boundary of the site, native boundary trees and shrubs will be planted with a native hedge mix, retaining all the mix planting against the boundary fence. The eastern boundary along the railway line has a native hedge mix with intermittent tree planting.
		Enhancement of Sinfin Lane Streetscape nr. Entrance	Planting will be introduced along the Sinfin Lane boundary. The screening is intended to soften the entrance area and to create an attractive green edge to the new development. A mix of trees and shrubs will be situated to screen the Education and Office building from view. As well as screening for travellers along Sinfin Lane, the green buffer will benefit residential properties and allotment users.
		Planting on the Acoustic Bund	Incorporating planting onto the bund creates extra height to act as screening as well as acting as an acoustic bund. The bund is to be 4m in height (1:25 slope) with a 15m wide structured planting mix with intermittent trees. The purpose for the bund is to mitigate potential views into the waste facility development from residential properties as well as a buffer between office employees in the new development and those travelling along Sinfin Lane. The bund also acts as a screen to make a separation between the Education and Office building and the main Waste Facility Building. This divide separates the more domestic scale of building near the entrance with the more substantial Waste facility building behind.
Ecology	Construction		
		Vegetation Clearance	Systematic clearance of vegetation at the outset of construction from south to north to prevent fauna becoming trapped in the centre of the site during site clearance.
		Breeding Birds	Time constraint on vegetation clearance outside the bird breeding season, (end of Feb to end of August) where possible, or inspection of trees/scrub to be cleared, in advance of clearance, to ensure no disturbance to active nests during site clearance.
	Operation	Melbourne Junction LWS	Enhancement of Melbourne Junction Local Wildlife Site through monitoring and targeted management
		Tree/Shrub Planting	Native tree and shrub planting to compensate for the loss of woody scrub and bramble and provide alternative habitat for wildlife in the operational development
		Hedgerows	Creation of native mixed species hedgerow as additional habitat to those affected by the development
		Habitat Creation	Provision of bat boxes, nest boxes and invertebrate habitat to provide features that are largely absent from the existing application site.
		Lighting	Installation of directional lighting to reduce light spill onto the railway embankment and new scrub habitats on the site boundaries.
		Formal Planting	Inclusion of fruiting and flowering species in formal planting areas around the education centre to provide a food source for invertebrates and birds.

Topic	Phase	Detail	Recommended Mitigation
Hydrology and Flood Risk	Construction	Surface Water Quality	A Construction Environmental Management Plan (CEMP) would be prepared before commencement of works to ensure that best practice is employed. The CEMP would include method statements for the Proposed Development, details of materials to be taken from and to the Assessment Site, and a pollution control and contingency plan. The CEMP is therefore of relevance to the removal of material with the excavation and construction of the subsurface storage cells. Although the CEMP would help protect surface water quality, it would also benefit other water resource aspects together also with associated areas of the environment. The potential effects identified in relation to surface water quality are applicable to most construction sites. The CEMP will be applied during construction of the Proposed Development to mitigate potential adverse effects on surface water quality. It is common practice for a local planning authority to impose planning conditions requiring a detailed CEMP to be submitted for approval prior to any development occurring on a site. The CEMP will draw on the CIRIA document "Control of Water Pollution from Construction Sites" and the Environment Agency guidance on Sustainable Drainage Systems (SUDS), together with the appropriate PPG documents. The specific measures for the protection of surface water quality during the demolition and construction activities will be included within the CEMP prepared for the Assessment Site (Chapter 10, Paragraph 10.7.3) The early phasing of the permanent surface water drainage strategy in the operation phase would help reduce potential impacts on surface water quality during the construction phase.
		Surface Water and Flood Risk	Temporary drainage facilities will be provided during the demolition and construction phase to ensure the controlled discharge of surface water run-off from the Assessment Site, until such a time as the permanent surface water drainage strategy is implemented. Early phasing of a part or the whole of the permanent surface water drainage strategy could also be facilitated. These surface water drainage facilities will limit ponding of water within the construction site and help minimise the risk of any localised flooding. Further detail on the incorporation and design of the surface water drainage strategy is included in the FRA in Appendix 10.1.
		Water Resources	Assuming the existing water, surface and foul water infrastructure is adequate for the operation of the Proposed Development, no impacts are anticipated and hence no mitigation required.
	Operation	Surface Water Quality	A management plan will be adhered to for the upkeep and long-term maintenance of the surface water drainage strategy. This would provide specific measures for the upkeep and maintenance of surface water quality interceptors and/or sumps, and for the means of isolation fitted within the infrastructure. The management plan would outline an emergency procedure to be followed in the event of a spillage or event that could impact on surface water quality. The management plan would also outline responsibilities for the operation of the surface water drainage strategy, including the required training programme for staff members.

Topic	Phase	Detail	Recommended Mitigation
		Surface Water and Flood Risk	A management plan will be adhered to for the upkeep and long-term maintenance of the surface water drainage strategy. The management plan would outline an emergency procedure to be followed in the event of a failure of the drainage strategy or with an extreme rain event. The management plan would also outline responsibilities for the operation of the surface water drainage strategy, including the required training programme for staff members. In addition to those outline in the Construction Phase, reference should be made to the relevant Pollution Prevention Guidelines (PPG) – notably to PPG8 (Safe Storage and Disposal of Used Oils), PPG20 (Dewatering of Underground Ducts and Chambers), PPG21 (Pollution Incident Response Planning).
		Water Resources	Measures to improve the sustainability of the scheme could be incorporated, with efforts to reduce the consumption of water and reduce the release of surface and foul water. This might include measures to promote the re-use and recycling of water within the Proposed Development so as to reduce overall demand – with rainwater harvesting and grey water re-use options for this. Measures to reduce the consumption and discharge of water from the Proposed Development should also be encouraged, such as low water consumption fixtures (e.g. toilets, taps) fitted with water efficiency and cut-off features
Hydrogeology & Ground Conditions	Construction	Dust Generation	Minimised by covering and damping down dusty surfaces during dry weather
			Wheel washing of vehicles exiting the site
			Any temporary storage of materials will incorporate appropriate risk control measures.
		Hydrogeological Regime	A review of the controlled waters risk assessment shall be undertaken should the finalised foundation design result in significant change in the hydrogeological regime be identified.
		Health & Safety	Precautionary measures will be put in place to protect construction workers involved in earthworks, by way of an earthworks methodology / construction management plan. This plan shall be designed to mitigate risks relating to the disturbance of residual soil or groundwater contamination, identification removal and validation of contamination hotspots and all statutory requirements associated with the earthworks such as discharge consents spoil generation handling and where appropriate off site disposal where required. This plan shall also include the groundwater management plan referred to earlier.
		Human Health	The quantitative human health risk assessments (HHRA) shall be revisited in line the final design for the proposed development, to confirm, or otherwise, the current low risk posed to human health through exposure to near surface contamination.
			Should residual risks be identified from the updated HHRA, appropriate remediation measures shall be agreed and included within the earthworks methodology / construction management plan.

Topic	Phase	Detail	Recommended Mitigation
	Operation	Gas Survey	Should a decision be made not to over-engineer the development design at this stage, a more robust ground gas investigation will be required. This new gas survey will enable the risk from ground gas to be assessed, most notably in the vicinity of the infilled ponds, and gas protection measures to be identified.
Noise	Construction	Noise	None required
		Vibration	None required
		Traffic	None Required
	Operation	Noise	None required
		Vibration	None Required
		Traffic	None Required
Amenity	Construction	Litter	During this phase there is almost no prospect of any generation of litter other than packaging associated building materials, etc. Should some litter become airborne it will be unlikely to escape from the site due to the effectiveness of the boundary treatment as a barrier.
		Vermin & Other Pests	None Required
		Mud Deposits	Wheel washing and regular road sweeping
	Operation	Litter	Should some litter escape form the building it will be unlikely to escape form the site due to the effectiveness of the boundary treatment as a barrier. Furthermore, there will be regular litter picking activities within the site
		Vermin & Other Pests	Enclosed building with fast acting doors inaccessible to vermin. The operation will include regular pest control inspections.
		Mud Deposits	None required
Archaeology	Pre-Construction And Operation	Archaeological Investigation and Preservation	None Required
Socio-Economic	Construction & Operation		None Required

16.14 Conclusion

16.14.1 The Environmental Impact Assessment has considered the likelihood of significant environmental effects occurring from the development of the Waste Treatment Facility (WTF) and associated development at Sinfin Lane. The environmental issues addressed as part of the scheme have been identified through consultation with the Council, its consultees and other stakeholder organisations. With mitigation measures incorporated, the significance of effects are at an acceptable level.

16.14.2 This Environmental Statement has shown that the proposed development will result in beneficial environmental effects by diverting waste from landfill, creating employment and by using waste as a resource through the recovery of energy. The development will provide facilities which may be used for education purposes. It is concluded that the choice of development is that described within this Environmental Statement.