
Burntwood Road, Grimethorpe

**Proposals for
agricultural and
ecological
improvement**

For

DTS (Environmental) Ltd

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LAND AT BURNTWOOD ROAD, GRIMETHORPE, BARNSELY

PROPOSALS FOR AGRICULTURAL AND ECOLOGICAL IMPROVEMENT

APPLICATION BY DTS ENVIRONMENTAL LTD

1.0 Introduction

The proposal is to import inert material residues from recycling activities from the applicants' inert waste recycling centre at Shaw Lane Carlton in order to modify the contours across a parcel of land located at Burntwood Road, Grimethorpe.

Inert waste is processed at the applicants yard at Shaw Lane, Carlton, Barnsley and it is proposed to reuse the residues from the recycling activities and soil forming material which are separated from the incoming waste to improve the agricultural value of the land. All materials will be clean, uncontaminated excavation material which would consist of typically, mudstones, sandstones and shales and any inert materials which cannot be recycled and used for secondary aggregate.

This land is used for agriculture but suffers specific impediments to agriculture including:

- Generally difficult north facing gradients at between 1 in 7 to 1 in 10.
- Specific gradients as steep as 1 in 2
- Thin soils due to loss down the steep slopes
- Loss of soil nutrients through rapid leaching down the steep slopes. Refer to the soils report and provisional agricultural land classification assessment which has been appended to this statement.

Therefore, planning permission is being sought to import residues from DTS recycling operations in order to modify the contours. Please refer to the restoration drawing DTS/BWR/09 to show the restoration proposals. The operation will first remove the topsoil and subsoil and store these in separate mounds along the boundary of Burntwood Road and will be stored until required for the phased restoration programme. They will also act as temporary screening bunds for the duration of the works. Any imported material capable of being used as soil forming material will be segregated for use in improving the soil thickness and stored in accordance with the best available techniques for soils handling.

The more even gradients and additional depth of soil and subsoil will facilitate a regime capable of improving the nutrient levels by the addition of organic and artificial fertiliser.

A pond will be constructed in the restoration scheme, please see plan number DTS/BWR/09. This will act as a drainage pond to collect surface water runoff and a further wetland area will be created to collect any overflow water. This will be create a permanent

feature to be retained after the land improvements are completed. Specific planting will be undertaken also and will add to the biodiversity of the area.

This proposal is the same as application B/03/1883/HR, Infilling and regarding of the land to facilitate agricultural use at Burntwood Road, Grimethorpe, which was granted planning permission on 16 March 2004.

It is anticipated that the scheme will be completed in 12 months.

2.0 The Site and Location

The subject land is located at Grimethorpe approximately 5 miles North-East of Barnsley, Grid Reference SE 416090.

As a former key mining village, Grimethorpe suffered from the demise of the coal industry which left a high proportion of the village's residents unemployed. The whole area is currently undergoing a large regeneration project with the aim of reviving the area and the development land and creating a better social and physical environment.

To the west of the application site there is a football ground and cricket ground. To the east is further agricultural land as stated above which has undergone a similar land improvement operation. To the south along Burntwood Road there are large areas of open space grassland which are currently in a disused state and the area is being used for keeping horses and towards the end of the road are a number of terraced houses.

The proposal does not involve the permanent erection of any buildings or structures. Temporary facilities such as a portakabin will be provided on site to aid the management of the site. The land itself has an overall disused appearance having been used in the past for grazing and set aside.

3.0 The Proposal

This is a proposal for re-profiling agricultural land using inert construction material with the aim of improving its agricultural potential.

It is proposed to improve the quality of the agricultural land by reusing inert residues from recycling operations undertaken at the applicant's facility. As previously stated, the material will be sourced from the applicant's recycling centre at Shaw Lane and will use the residues from the recycling processes undertaken at the site. These residues cannot be used for any other purpose and would eventually be sent to landfill. It is the applicants intention to reuse these materials in accordance with the waste hierarchy and divert the material from landfill which accords directly with PPS10. This is waste that falls into the definition of inert waste dictated by the Landfill Directive. No putrescible or biodegradable waste will be accepted onto the site.

The operations will remove and store the existing, sparse topsoil to enable inert material such as soil, stone and inert construction material to be imported and reused to the site. This will fill the existing hollow areas and raise the level of the southern part of the land to create a more even graded area over most of the field. The resultant contours and increased depth of soil will create a more versatile system of agriculture, including arable cropping.

Soil making material will be brought in from the recycling centre at DTS and with nutrients added will be stored on site and used in the restoration scheme to provide a greater depth of topsoil and subsoil than exists at present. The site only has a sparse cover of topsoil as highlighted in the soils report prepared by Land Restoration & Management Ltd (in Appendix A) and this scheme will improve this by providing additional soils to benefit the end use for agriculture.

The agricultural quality will be upgraded by thickening the soil depth across the site. Approximately 600mm of subsoil will be added to the inert material and then 300mm of topsoil. It is also considered likely that ecological improvements will be forthcoming from the creation of a defined water body and wetland area and associated planting which will improve the biodiversity in line with PPS9.

The restoration proposals will create a waterbody collecting drainage water and conducting this away from the site in a piped drain. See plan number DTS/BWR/... This water control will release most of the land that is presently waterlogged and of low agricultural value. Selective planting in the vicinity of the new water body will create a more diverse ecological regime and will improve biodiversity as ponds are often very rich in biodiversity and are particularly important for aquatic invertebrates, wetland plants and amphibians.

The imported soil material will improve the existing nutrient status simply by the fact that we will be increasing the depths of soil and subsoil which will facilitate a regime capable of improving the nutrient levels by the addition of organic and artificial fertiliser. Any imported material capable of being used as soil forming material will be segregated for use in improving the soil thickness.

The land requires improvement because there is a deep ravine across the field. It has been washed away by water issuing from an outlet pipe. The ravine will be filled with coarse aggregate to provide drainage to the pond and then the imported material will be utilised above to a maximum depth of two metres.

The existing drainage ditch will be retained and we will continue to pipe from this towards the new pond. The pond will be approximately one metre deep to accommodate 900 cubic metres of rainwater and will be lined with clay.

There is already an existing pond situated there and we will improve this to accommodate more surface water run-off to prevent the site from potential flooding. Excess surface water will be caught by the drainage ditch and in periods of heavy rainfall will drain towards the wetland area. There is no specification for this as such, it will just be an area of the land to accommodate excess water and to create a marshland area.

The remodelled contours will also enable further improvement to the ecological value of the land by creation of pond areas to act as the focal point of land drainage.

The 39000 cubic metres of fill material is necessary to create an evenly contoured field suitable for agricultural end use. As stated previously, not all the material which is brought in will be recycled excavation materials, some of which will be soil forming material and soils which have been separated on site and will greatly improve the nutrient status of the land once organic and artificial fertilisers have been added.

We are aware of the two water mains which run through the site. During correspondence with Yorkshire Water, they state that the water mains and services generally have a minimum cover of 900mm and 750mm respectively. On this site this is not the case as the pipe is already exposed has been damaged due to machinery driving over it. Our proposals will increase the depth of ground cover of up to two metres which will provide adequate depth when working with machinery. The manhole chambers will then be built up to the required depth for access.

These activities carry a very low risk to the environment. Imported materials will be regularly sampled and analysed to ensure that no contaminants or potential contaminants are present.

This site is in an area of Yorkshire where most of the agricultural land is moderate to low quality agricultural land under permanent pasture and supporting livestock grazing. Please refer to the soils report and agricultural land classification statement in Appendix A.

The restored areas shall be actively managed with an aftercare scheme to provide drainage, control of weed growth and re-seeding where required.

The site covers an area of approximately 41350m² and should achieve 39000m³ tipping capacity over the duration of the scheme.

There is currently a shortage of void space available for tipping in the area, some of the sites based locally are:

Stairfoot Brickworks – There was void space available in the north quarry but it is understood that this void space has now been restored at a lower level and therefore no void space currently exists at the site.

Naylor Drainage, Bankswood Site, Cawthorne – This site has been granted planning permission to extend the quarry area for clay winning. The site has also been granted a PPC permit for continued waste disposal. The site is used for the factory waste and some importation of local inert waste.

At this present time, no void space is available for the disposal of waste other than small amounts from the factory. The void space will not be created for 3 to 5 years as quarrying continues and void is used to backfill overburden.

4.0 Landform & Geology

The landscape of the character area is underlain by middle coal measures, comprising alternating bands of shales and sandstones with coal seams that have weathered and eroded at different rates, giving rise to a rolling landform.

The majority of the character area consists of a west facing valley side and a smaller area covers part of the flat narrow ridge at the top of the slope. The valley side is interrupted at frequent intervals by steep narrow valleys that contain narrow watercourses flowing towards the valley floor to the west. The lower part of these 2 watercourses contains narrow alluvial deposits lying over the middle coal measures. The elevation rises from 50m AOD on the western side of Grimethorpe to 115m AOD on the ridge top plateau within West Haigh Wood.

The site itself goes from a low of 50m AOD in the North West corner to approximately 65m AOD at the top of the site along Burntwood Road.

5.0 Policy Issues

Introduction

This section of the statement considers the proposed development against the prevailing planning and other policy documents which the planning authority must consider and have regard to in determining this planning application.

Planning control is a positive instrument that seeks to examine and reconcile, as far as possible, potentially conflicting claims over land use. Planning policies are an essential element of control and are developed at national, regional and local level.

Central government provides a national framework for the operation of the planning system by formulating national policies and guidance. County Councils and Unitary Authorities are responsible for setting out general planning policies on matters of strategic importance, which are embodied in structure plans and Unitary Development Plans. Where appropriate Local Plans are intended to provide detailed specific planning policies within the general framework of the relevant Structure and Unitary Development Plans.

5.1 National Policy

Planning Policy Statement 10

PPS 10 'Planning and Waste Management' (1999) provides policy guidance on waste management. The guidance advocates that future waste management decisions should be based upon the following principles:

1. Consideration of the Best Practicable Environmental Option (BPEO) for each waste stream;

2. Regional self sufficiency;
3. The proximity principle;
4. A waste hierarchy.

The waste hierarchy is:

- Reduction
- Re-use
- Recovery (recycling, composting and energy recovery)
- Disposal

This proposal will involve reusing mostly the residues from waste recycling activities which would normally be sent for disposal at a landfill facility. The applicant operates an inert waste recycling centre which recovers inert waste streams and recycles for use as secondary aggregates. The waste from this process has to be disposed of somewhere and this proposal would see the inert material destined for disposal and would be moved up the waste hierarchy and reused in this scheme as a beneficial use for the improvement of the land.

Whilst each level of the hierarchy has a role to play, it provides a theoretical framework to be used as a guide for ranking waste management options being considered as part of the BPEO assessment for individual waste streams. The aim being to direct component materials within each waste stream further up the hierarchy.

The principle of regional self sufficiency states that each region should provide for facilities with sufficient capacity to manage the quantity of waste that the region expects to deal with in a specific area, over at least the next ten years. For the future, given the expected significant increases in the levels of waste that will have to be managed, a large number of additional landfill facilities, such as the proposed development, will inevitably be required.

The proximity principle requires waste to be managed as near as possible to its place of production because the transportation of waste has an environmental impact.

Annex A of PPS 10 considers the future need for landfill development in the UK. The guidance states that although in the interests of sustainable development, alternative forms of waste management must be used to deal with waste, which this application proposes.

This application will use recycled and recovered materials from the applicant's waste recycling operations. It therefore does not prejudice movement up the waste hierarchy as it is using recycled materials and residues from this recycling operation but enables it in accordance with the key planning objectives in PPS10 to improve the agricultural condition of the land at Burntwood Road.

PPG 2 – Green Belts

The use of land in Green Belts

Once Green Belts have been defined, the use of land in them has a positive role to play in fulfilling the following objectives:

- to provide opportunities for access to the open countryside for the urban population;
- to provide opportunities for outdoor sport and outdoor recreation near urban areas;
- to retain attractive landscapes, and enhance landscapes, near to where people live;
- to improve damaged and derelict land around towns;
- to secure nature conservation interest; and
- to retain land in agricultural, forestry and related uses.

This proposal will be in accordance with PPG 2 on the use of land in green belts as it will improve the land and retain the land in agricultural use and will also retain the attractive landscape and eventually enhance this. The loss of this land is for a temporary period of 12 months and will be restored to a more beneficial use than there is at present as the land is unsuitable for agricultural use due to the uneven contours and steep slopes and the ravine which is situated in the land. The addition of a wetland area/pond to be retained after the land improvement operations will help secure nature conservation interests by providing an improved habitat area.

5.2 Local Policy

POLICY ES1

The council will refuse proposals for development which are likely to result in harm to the environment through excessive levels of pollution arising either within the site to be developed or occasioned elsewhere by the proposed development. The council will in particular resist development which is likely to result in housing, schools, hospitals or other sensitive land uses being subjected to excessive levels of air, noise or other pollution. Where development is permitted the council will seek to ensure that resulting pollution is avoided or minimised.

The proposed development will not result in any harm to the environment. As stated in the sections on Noise and Dust working will be suspended in times of adverse weather conditions. All best considered techniques and standards will be followed with regards to pollution. The proposal is for 12 months and the land will be restored to an attractive and beneficial after use.

POLICY GS7

Without prejudice and subject to the application of policies GS8, GS8a, GS8b, GS8c, GS8d, GS8e and GS9 in this plan, development within the green belt will not be permitted unless it maintains the openness of, and does not conflict with the purposes of including land in, the green belt.

The land will be reinstated after the 12 months land improvement scheme and therefore does not conflict with Policy GS7.

POLICY GS9

Development within the green belt, or conspicuous from it, should not by reason of its siting, materials or design result in significant harm to the visual amenity of the green belt.

The land will be reinstated after the 12 months land improvement scheme and therefore does not conflict with Policy GS9.

POLICY GS14

The council will continue to encourage and assist farmers and land owners to conserve and improve the landscape. Where opportunities arise, resources will be concentrated on areas of relatively poor landscape outside borough landscape value areas.

This is a land improvement proposal to benefit a parcel of agricultural land which is difficult to farm due to the steep gradients in areas of the land. The land will be evenly graded and made more attractive visually due to the addition of a pond, tree planting a new hedgerow and existing hedgerow improvements.

5.3 Waste disposal policies

The primary concern of this part of the plan is the land use implications of waste disposal and this is reflected in the policies previously mentioned. These policies are consistent with the 'relevant objectives' set out in the EC Framework Directive on Waste and PPS23.

Waste disposal was not identified as a key issue during the preparation of South Yorkshire Structure Plan, due to the lack of essential survey work information. At a late stage in its preparation it was accepted that waste disposal policies should be developed in the review of the Plan but this review was never carried out. Consequently, there was only a general statement of intent in the Plan, and a reference to restoration of mineral workings by infill with waste, and these now need to be replaced by updated policies.

The South Yorkshire Minerals Local Plan did not deal with waste disposal as a self contained issue, but it did recognise the close linkages between mineral extraction and

waste disposal, especially in the field of restoration. The possibility of using waste disposal as a means of restoration has several potential benefits. It can reduce the net amount of land taken out of agriculture or other uses; better land form can be achieved; more effective use of investment in infrastructure can be obtained, and often the environmental impact can be reduced by effective screening.

The Minerals Local Plan also identified the problems and risks that could be created by waste disposal. The issue of potential pollution to surface and underground water is a major factor, and the Environment Agency groundwater protection policy is an important basis for proposals. Waste disposal can also damage local amenity as a result of traffic, smells, fumes, wind blown material and pest infestation, although all of these can be reduced by good management.

There is an important need to relate the planning process to on-site control through waste disposal licences, and to have regard to the best practice procedures set out in the series of Waste management Papers which are available. The Environment Agency is preparing a Waste Disposal Plan under the requirements of the 1990 Environmental Protection Act, but it is a planning responsibility to deal with the land use issues and the impact of the site on the surrounding area. The operational policies of the Waste Disposal Authority are set out in the draft Waste Management Plan and these will complement the policies contained in the Unitary Development Plan.

Because of this situation, therefore, most of the policies referred to below relate to landfill, although some are equally relevant to waste processing facilities. Should there be a major change in the waste disposal market, then these policies will need to be reviewed.

POLICY WD2

In order to minimise the need for waste disposal sites and facilities, the council will seek to minimise waste generation and to achieve the maximum amount of re-use and recycling of potential waste materials.

The material used will be from the waste recycling centre at Shaw Lane, Carlton. The material will have been recycled first and used to produce secondary aggregate for the construction industry. The recycling operations on the inert C,E,D waste streams produce residues which are generally destined for disposal at a landfill site. The applicant is intending to reuse these residues to improve the quality of the agricultural land which is the subject of this application. The reuse of these residues and their diversion away from disposal at a landfill site accords with policy WD2 as it maximises the reuse of potential waste materials.

POLICY WD3

Proposals for waste disposal sites and facilities will be considered on their merits, and the environmental acceptability of such proposals will be assessed with regard to the following:

- A) *The effect on local amenity based on an assessment of visual impact, dust, fumes, noise and other potential disturbance, taking into account screening and other protective measures, which are available.*
- B) *The likely duration of tipping*
- C) *The proposed final appearance and landform of the site*
- D) *The effect on the natural and built environment*
- E) *The effect on agricultural land*

These effects shall be demonstrated wherever appropriate by the preparation of an environmental statement. Planning permission will not be granted where there is significant and unavoidable damage to the environment resulting from any of the factors identified above.

This proposal is of a temporary nature at 12 months so any impacts, if any, will be temporary and will benefit the final appearance of the land and will improve the agricultural value. With best practice employed on site, the effect on the local amenity with regards to dust and noise will be minimal.

POLICY WD5

The council will seek to ensure the use of the best available techniques to improve standards of design and control in waste disposal operations.

POLICY WD4

The following transportation criteria will be taken into account in consideration of planning applications for waste disposal :

- a) *The effect which traffic generated by the proposed waste disposal will have on road safety, property, and the amenities of the people living in the vicinity of the development, or along the transportation routes likely to be used*
- b) *The degree to which alternative transport modes can be used to minimise traffic disturbance.*

6.0 Working Method and Soils Management

I) Soil Stripping

Compaction, smearing and loss of soil structure can be caused by handling and movement of soils in unfavourable weather and soil moisture conditions, by unsuitable storage of soils, and by passage of machinery with high axle weights or ground pressures across soils. During periods of weather generally suitable for soil stripping, supervision should ensure that operations should be suspended after heavy rain. The damage caused to soils by continuing earthmoving during adverse soil moisture conditions may be costly or impossible to reverse during aftercare.

II) Soil Management

Wherever possible soils should be moved from areas being stripped to areas being restored as storage necessitates double handling and increases the opportunities for soil loss. Progressive reclamation reduces the need for soil storage but this will need to take place on the majority of the site.

III) Working Method

The site is to be worked in 4 phases with Phase 1 at the south of the proposed site (see restoration drawing – DTS/BWR/04

Borehole information suggests that approximately 300mm of soil exists across the area to be worked. Of this there is about 100mm of topsoil and 200mm of subsoil. Therefore it is estimated that 8200 m² of topsoil and 12200m² subsoil will need to be stripped and stored to be made available for the restoration of the scheme.

See drawing Numbers DTS/BWR/05-08 for full phasing schedule and topsoil and subsoil storage positions.

Existing topsoil and subsoil shall be stripped first from phases 1 & 2 and this will be stored at the boundary of the works along Burntwood Road. This will also act as a screening bund and will be approximately 5 metres wide by 2.5 metres high. Topsoil will be stored separately in a bund to the east of Phase 1.

Tipping will commence in Phase 1 and material will be compacted and pushed in a northerly direction towards Phase 2. Restoration will be progressive so material can be removed from the storage bunds and replaced and existing soil from Phases 3 & 4 can be stripped off and stored as before.

No fill material shall be imported or stored on the site until the existing topsoil and subsoil have been removed from the working phase and stored in the areas on the approved drawing. The topsoil shall not be stored higher than 2m above the existing ground level to ensure proper restoration of the site.

Tipping should be done in accordance to the approved restoration contour plan DTS/BWR/09, which will permit tipping no higher than 2m of the existing ground levels of the site.

Profile boards situated around the site will indicate the approved restoration levels.

The imported waste will be dumped in piles and pushed out by a slow moving dozer or a front-end loader to layer the waste and provide compaction. The coarser waste fraction will be tipped at the base of the site and finer material will be tipped to cover the coarse waste. The area will be levelled up to the agreed levels and covered over with some clay material to seal the imported waste material before re-applying the subsoil and topsoil.

7.0 Landscape and Visual Impact

Landscape Assessment

Landscape impacts are changes in the fabric, character and quality of the landscape. These could include direct impact upon specific landscape elements (such as loss of woodland or hedgerows) or effects on landscape character and designated areas of landscape.

Visual Impacts

Visual impacts relate to specific changes in the character of views and the effects of those changes on visual receptors (for example users of roads or rights of way, residents or users of recreational facilities).

The degree of change is referred to as magnitude of impact.

Magnitude of Impact

Magnitude of impact predicts the degree to which impact on landscape character, physical impact to landscape features or change in view character would occur as a result of the proposed development. The magnitude of change is considered in relation to the sensitivity of the receptor.

Assessment of impact on property is carried out on the basis of predicted effects on views from rooms normally occupied during waking / daylight hours, and gardens. Views from rooms used for sleeping are usually deemed less important. It should be noted that the assessment of views from properties is based on a best assumption from publicly accessible locations close to the properties. Where it has not been possible to assess the effects on properties from public viewpoints or where confidence in predictions are low, this is stated within the text.

In making the above assessments, the '*magnitude of impact*' is considered alongside the '*sensitivity*' of the individual receptors to determine the overall significance of the impact. Magnitude of impact (assessed as; *substantial, moderate, slight or negligible*) predicts the degree to which the landscape character, landscape features or view would change as a

result of the proposed development. Sensitivity predicts the degree to which individual receptors will be affected by the change. Sensitivity varies between receptor types, for example, a small-scale rural landscape may be more sensitive to change than an urban fringe landscape which has been modified by man-made detractors; views from public rights of way would normally be more sensitive to change than views from roads, given the relative speed at which the observer moves.

By combining the assessment of magnitude and of sensitivity, it is possible to predict the significance of the impact, which may be *negligible, slight, moderate or substantial* and can be either beneficial or adverse depending on the nature of the development and the mitigation and enhancement measures proposed. The following tables have been used to determine magnitude, sensitivity and impact significance for the landscape and visual features and receptors.

Magnitude of Impact Table

Magnitude of Impact	Criteria for assessing Landscape Impact	Criteria for assessing Visual Impact
Substantial	Notable change or loss in landscape characteristics over a wide area or very intense change over a small area.	The majority of viewers are affected; major changes in view; open views of site.
Moderate	Moderate changes or loss in landscape characteristics	Many viewers affected; moderate change in view; partial views of the site.
Slight	Slight change or loss in any components of the landscape	Few viewers affected; minor changes in view.
Negligible	Virtually no significant changes to landscape characteristics	Obscured view; barely perceptible

There may be a substantial loss of landscape for a number of the closest properties but this would be temporary. The land will be progressively restored so the impact of this loss will not be as severe.

We are aware that the proposed development will result in an adverse visual impact, albeit a temporary one. Topsoil and subsoil which has been stripped from the working area will be stored separately and placed in bunds which will act as a screen for the workings. Any soil material which is separated from the imported materials will also be stored and used in the restoration scheme. The bund will be placed along the boundary along Burntwood Road up to a height of 2.5 metres which will screen as much as possible from the road and footpath.

Due to the topography of the land, it is not possible to completely screen the works from residents along Burntwood Road, Nancy Crescent and Ladywood Road but this is a temporary scheme and the visual impact will be an improved one once the works are completed.

The land as it is at present is a barren and low grade agricultural quality parcel of land and the end result will be a more evenly contoured parcel of land, which is rich in soils and nutrients and will create a more versatile system of agriculture which could include arable cropping. Also a pond and additional tree planting area and hedgerow planting along the boundary to Burntwood Road will further enhance this area and will improve the visual impact of the area in the long term.

8.0 Drainage

The surface water will be directed towards the proposed pond and wetland area. The pond will accommodate 900 cubic metres of water and any overflow will be drained towards a wetland area to drain naturally. This is adequate for this scheme as there is no evidence of the site flooding in the past. Please see below the calculations for surface water runoff at the site:

The average rainfall amounts have been derived from the data supplied by the Meteorological Office. This data is from their monitoring station in Sheffield and the average monthly rainfall over data compiled from the last 10 years data is 70mm per month = 840mm per year.

Potential Evapotranspiration data is not available for the area. However an estimated potential evapotranspiration can be derived from data supplied by MAFF (1975). This gives the following figures:

Summer - 400mm
 Winter - 40mm
 Total yearly = 440mm

The mean infiltration using the above data can be calculated to give the following:
 $840\text{mm} - 440\text{mm} = 400\text{mm per year}$

Site Area = $41350\text{m}^2 \times 0.4 = 16540\text{m}^3$ or 45.31m^3 per day.

In a 30 year event in a 30 minute storm period, the volume of water would be 44mm based on the multiplying factor used for flood flows by the Environment Agency and with 20% for climate change would be 52mm in a 30 minute storm.

$41350\text{m}^2 \times 0.052\text{mm} = 2150\text{m}^3$
 $2150 / 1800 \text{ seconds} = 1.19\text{m}^3$ per second or 1194 litres per second.

Most of this rainfall will infiltrate into the ground or evaporate before it reaches the pond. The new proposals will not increase surface water run-off from the existing situation but will be more able to accommodate heavy rainfall due to the construction of the new pond and drainage ditches and wetland area.

9.0 Noise

Minerals Policy Statement

Where appropriate, planning conditions should be used to ensure that minerals operations are carried out in such a way that the noise emissions are minimised at source and thereby controlled to acceptable levels.

The layout and plant location, the sequencing of operations and the hours of working can have significant effect on the levels of noise emissions and their impact on sensitive receptors.

Planning conditions may be used to apply absolute controls on noise emissions with limits normally being set at particular noise sensitive properties. This enables the effect of noise to be related most directly to its impact on local people.

In some circumstances, however it might be more appropriate to set the limits at the site boundary or some other point. Subject to a maximum of 55dB(A) Laeq, MPA's should aim to establish a noise limit at the noise sensitive property that does not exceed the background level by more than 10dB(A).

It is recognised, however, that this will in many circumstances be difficult to achieve without imposing unreasonable burdens on the mineral operators. In such cases the limit set should be as near that level as practicable during normal working hours (07.00 – 19.00) and should not exceed 55dB(A) Laeq.

All mineral operations will have some particularly noisy short-term activities that cannot meet the limits set for normal operations. Examples include soil stripping, the construction and removal of soil storage mounds and the construction of new permanent landforms. However, these activities can bring longer term environmental benefits.

Increased temporary daytime noise limits of up to 70dB(A) Laeq, for periods of up to 8 weeks per year at specified noise sensitive properties should be considered to facilitate essential site preparation and restoration work where it is clear that this will bring longer term environmental benefits to the site.

Where work is likely to take longer than 8 weeks, a lower limit over a longer period should be considered.

Operators should seek ways of minimising noisier activities and the noise emissions from them when designing the layout and sequencing of temporary operations and should liaise with local residents prior to such operations taking place.

Where possible, workings should be arranged so that earlier operations provide screening for noise sensitive properties from noise generated by subsequent activities. This could influence both the direction of working and the placement of overburden and soil mounds on the site perimeter.

9.1 Noise Monitoring

Monitoring should be undertaken during normal production working hours. Measurements should ideally be taken in calm conditions or where there is a component of wind blowing from the site towards the measurement location. Where noise monitoring is undertaken when weather conditions are not ideal and noise levels appear to be of concern, the impact of weather conditions on ambient noise should be considered as well as noise propagation from the site.

The nearest dwellings to the proposed application are to the south of the site along Burntwood Road.

These properties will be well screened from the proposed development as a large screening bund will be constructed along the south of the site which will screen the works from Burntwood Road and will also act as baffle mounds to minimise the noise impacts to these properties.

They will benefit further from topsoil and subsoil screening bunds, which will be positioned on the boundaries of the site to the South and east, which will act as baffle mounds.

The waste to be tipped will have been crushed and broken down prior to bringing into the site, therefore noise from such treatment will not occur and noise will only arise from the operation of plant involved in tipping and spreading of the materials. The plant involved is likely to be a small JCB and dozer.

Soil removal, waste disposal and restoration operations on site shall only be carried out between the hours of:

Monday – Friday	07.00 – 18.00
Saturday and Sunday	07.30 – 13.00

There shall be no working outside these hours. No working shall take place on public holidays unless agreed in writing with the Mineral Planning Authority.

10.0 Dust

Current Regulations

The amount of dust that might cause a potential nuisance is extremely difficult to determine. Similarly, numerous attempts have been made at identifying a nuisance standard for dust, without success.

Currently, there are no statutory or recommended levels of dust deposition that may constitute an official nuisance. It is normally left to the Local Environmental Health Officer, under Part III Section 791(d) of the Environmental Protection Act, to determine, if, in his opinion, a statutory nuisance exists.

Planning permissions incorporate a number of conditions for the minimisation of dust emissions, and these were generally based on the principle of the Best Practical Environmental Option appropriate for the site under consideration.

The three main factors, which potentially affect the sensitivity of the site with regard to dust, are:

- The distance of inhabited areas from site activities
- The location of the inhabited areas relative to the prevailing winds
- The density of habitation

The most critical element in the consideration of the potential for a dust nuisance to be caused is the direction of the prevailing winds. The general prevailing winds in the U.K are South-Westerlies (blowing from Southwest to the Northeast). To determine the sensitivity of the surrounding area, the location of residential areas to the site activities has to be examined.

The operator shall appoint a responsible person for dealing with environmental issues on the site. That person will keep a daily log of the weather conditions, including the direction of the prevailing wind. This log will include any complaints received, with a record of any investigations carried out and changes to the working practices on that day. The log will be available for inspection on the site.

The following shall be implemented:

- All unsurfaced roads to be dampened when necessary
- Vehicles used for the movement of materials on the site, where appropriate, shall be fitted with exhausts pointed away from the ground
- A speed restriction shall be imposed on the site of 15mph.

In the event that the wind is blowing towards any sensitive properties, the responsible person shall satisfy himself that the control measures are adequate. If the control measures are insufficient to prevent dust blow from the operations to the sensitive locations, the filling operations shall cease until the conditions improve.

It is not anticipated that dust will be a problem but the soiling operations could be potential sources of dust during periods of prolonged dry weather. The soil bunds will be seeded immediately after completion with a grass seed mix to prevent dust blow. All vehicles carrying material to be tipped on the site will be sheeted.

The spreading of the material, either by dozer or front end loader, involves the slow movement of these items and therefore vehicle speed is not a significant factor when considering the potential for dust nuisance being caused.

A water bowser will be used to suppress any unacceptable levels of dust during soiling operations. In the event that weather conditions mean that the suppression of dust by these methods is not successful, operations on the site will be suspended until weather conditions improve to permit resumption.

No development shall take place until wheel cleaning facilities have been installed on the site. The facilities shall be maintained in working order at all times and shall be used by any vehicle carrying mud dust or other debris on its wheels before leaving the site. No vehicle shall leave the site carrying mud dust or debris.

In particularly dry conditions the haul road into the site may need to be dampened to ensure that dust emissions are minimised so that dust is not carried onto Burntwood Road and the main road network.

Also the movement of topsoil and subsoil will be suspended in adverse weather conditions to further reduce the possibility of dust emissions.

11.0 Vehicular Movement and Control

The number of vehicles bringing material to the site will be kept to a minimum to ensure the operator maintains a steady output. It is estimated that no more than 40 vehicle movements per day will be involved, (20 in, 20 out). The transport route will be agreed with the MPA. This is a maximum figure and it is likely that vehicle movements will be less throughout the duration of the scheme but this is a maximum that may be required dependant on the availability of suitable materials.

It is anticipated that the scheme will be completed in 12 months.

The site will have easy access out of Grimethorpe either out through Brierley Road and out on to the Barnsley ring road or alternatively via the A6195.

The access point for all vehicular movements will be just off Burntwood Road. Please see Plan No DTS/BWR/11.

All vehicles entering the site with material to be deposited will be sheeted, the access road into the site will comprise hard standing, and this will be retained for the duration of the operations.

Policy WD4 of the Barnsley UDP states:

The following transportation criteria will be taken into account in consideration of planning applications for waste disposal

- A) The effect which traffic generated by the proposed waste disposal will have on road safety, property and the amenities of the people living in the vicinity of the development, or along the transportation routes to be used**
- B) The degree to which alternative transport modes can be used to minimise traffic disturbance**

Waste disposal sites and facilities generate considerable volumes of road traffic. Good location and acceptable access to a major highway are important elements in an

acceptable site. Proper management of vehicles, the site and loading are essential to prevent nuisances and the deposit of material on adjacent roads.

12.0 Soil Restoration and Cultivation

Soil Restoration

Following replacement of the inert material to within 1.5 metres of the final surface level, any surface stone or deleterious material exceeding 225 mm in any dimension shall be removed and buried at least 3 metres below the final surface.

During a period of dry weather, subsoil (and soil-forming material) is to be lifted from storage and spread over the tree areas to a final thickness of 1.5 metres.

Following replacement of the agricultural subsoil, topsoil will be laid to a thickness of 300mm. Any aftercare measures using plant or machinery that may be capable of causing damage to the soil will only be carried out in suitable weather conditions when the topsoil is in a dry and friable condition.

Cultivation

Following the replacement of topsoil, the agricultural area shall be cross ripped to the full depth of topsoil to relieve any compaction. Any stones larger than 150mm, or any other impediment to cultivation, shall be removed from the surface and not buried within the topsoil material.

The area shall be cultivated to provide an even seedbed. Cultivation shall include chisel ploughing, multiple passes with discs and rolling. During this operation, any stones or deleterious material larger than would pass through a 15cm wire screen mesh shall be removed from the surface.

The topsoil will be analysed in order to identify levels of soil nutrients and pH. Any deficiency in nutrients or indication that liming is required will be addressed by the application of fertiliser or lime, in accordance with the requirements indicated by the analysis.

The agricultural area shall be brought back into arable use by drilling and establishing a cereal crop.

Each spring, further soil samples shall be analysed to determine any additional nutrient requirements. Fertiliser and other nutrients, as indicated by the soil analysis, shall be applied. The growing crop will be treated with suitable herbicide and pesticide as and when required.

Aftercare meetings shall be convened in late summer each year in order to discuss the detailed proposals for the forthcoming year, and to review the results of the previous year.

These annual meetings shall be attended by representatives of the landowner, site operator and the MPA (with DEFRA and/or Forestry Authority representation as required).

Hedgerows

New or reinstated field boundaries shall be established by planting hedgerows to be planted into a ploughed hedge cam. Planting shall comprise two rows 15cm apart with the hedge plants staggered in the rows at 25cm spacing.

The hedge shall consist of the following numbers of plants per linear metre:

<i>Crataegus monogyna</i>	Hawthorn	5no.
<i>Prunus spinosa</i>	Blackthorn	2no.
+ 1 randomly drawn from:		
<i>Viburnum opulus</i>	Guelder Rose	
<i>Rosa canina</i>	Dog Rose	

The new hedgerow shall have post and wire fencing erected on each side in order to prevent damage.

Plants shall be protected by individual plastic spiral rabbit guards with supportive cane.

The hedgerow shall be sprayed annually to destroy competitive weed growth in the hedge bottom. Any hedge plants that fail during the 5 years aftercare period shall be replaced.

13.0 Tree Planting Scheme

The species mix includes a low to medium growing shrubs, with nurse and climax trees located on the lower slopes. The main broadleaf species drawn from Oak and Ash, with Silver Birch as nurse trees. To add colour and wildlife interest, Rowan, Holly and Elder are included in the selection.

Trees and shrubs will be planted in the first available planting season during the winter months between November and March but not when the ground is frozen or extremely wet. The trees will be protected by proprietary spiral guards or tubes with shrubs being contained in shelters where appropriate. Trees will be planted in the east of the site, please see restoration plan DTS/BWR/09.

Specification:

The tree and shrub planting schedule comprises the following:

SPECIES	SIZE	TYPE	NO.	PLANTING DETAILS
<i>Betula pendula</i>	60-90	1 + 2		Planted in groups
<i>Crataegus monogyna</i>	40-60	1 + 1		Planted in groups
<i>Fraxinus excelsior</i>	60-90	1 + 2		Planted in groups
<i>Ilex aquifolium</i>	1 + 1	2ltr		Planted in groups
<i>Quercus petraea</i>	60-90	1 + 2		Planted in groups
<i>Sorbus aucuparia</i>	40-60	1 + 1		Randomly planted in groups
<i>Sambucus nigra</i>	40-60	1 + 1		Randomly planted in groups

All plants will conform to BS3936 for nursery stock in terms of type, quality, condition and size. Before planting, all bare-rooted plants will be dipped in a proprietary root dip.

Plants will be transported to the site properly secured with any bare roots covered to protect from desiccation or damage. Plant roots will be covered at all times while awaiting planting to prevent drying out. Plants will not be left overnight on site uncovered but will be heeled in where necessary.

The trees and shrubs will be planted in staggered rows with 2 metre spacing between plants and rows. The climax trees will be planted on the mid to lower slopes with nurse species while the medium trees and shrubs will be located on the upper slopes. A corridor for access will be left along the crest of the bund.

Trees will be planted with the nursery mark or root collar at surface level. Planting will be by means of notch planting the smaller specimens and pit planting larger root systems by digging over the excavated pit and incorporating soil or compost if the backfill material is considered to be of poor quality. Planting procedure shall comply with BS4428 (1969) and recognised good horticultural practice. Slow release fertiliser such as 'Enmag' or similar product will be applied to each planting station.

Due to the potential of damage from rabbit browsing, the trees will be protected by plastic spiral guards or shelters such as 'Tubex' or 'Acom' tree shelters secured by a cane or stake as appropriate. Trees will be firmed up each spring to ensure that the trees and shelters remain firmly in place with the correct adjustments as necessary.

Competitive weeds and grass will be controlled by spraying 1 metre diameter around each tree station using a suitable pre-emergent or contact herbicide. Any noxious weeds within the planted area will be treated by spot spraying as early as practicable within the growing season prior to seeding taking place. Care will be taken to avoid direct spray contact with any trees.

If required a suitable slow-release fertiliser will be applied to each tree when weeding has been completed.

Throughout the maintenance period any trees that have failed during the previous year will be replaced in the next planting season.

- ♦ Sampling and analysis will be adopted as appropriate for the waste and soil concerned
- ♦ Imported soil material will be used that will improve the nutrient status of the site and enable additional nutrients in the form of organic or artificial fertiliser to further enhance and improve the soil structure.
- ♦ The revised landform will enhance the ecological benefit of the site.
- ♦ The activities can be carried out without harm to the environment or human health

14.0 Conclusions of the Proposal

1. The scheme will enable the land to be placed in a more beneficial agricultural use and permit more control over surface water run off that collects against the boundary wall near the sports ground.
2. The land will be planted with hedgerows and trees and will be cultivated to provide an enhanced view to local residents in comparison to an unkept field which is weed infested. The land can be managed and sown for hay meadow when not used for arable use and can be mowed regularly.
3. Currently it is difficult to cultivate the land due to the deep ravine like watercourse, the outfall and the sewer line.
4. Grimethorpe is experiencing a great deal of development as is the rest of Barnsley, especially around the eastern side of the authority. A shortfall of mineral sites has been identified that could provide immediate landfill void and therefore the inert waste currently being produced should be put to beneficial use.
5. Regarding the duration of the operation, the timescale is relatively short at 1 year from soil stripping to complete restoration.
6. The regulation of the activity will be undertaken by the Mineral Planning Officer at Barnsley MBC and the environment agency as part of their control over waste licence exemptions. The scheme will comply with a Paragraph 7A exemption and the scheme will be submitted to the environment agency once planning permission is granted.
7. The scheme will be in accordance with all Government guidance of waste, as the material will be the residue from recycling activities to create secondary aggregate. Other material will be excavation waste that cannot be used elsewhere apart from restoration material to enhance the topography. The material is fit for purpose and if compacted in layers will provide a solid base for the proposed improved agricultural use.
8. Due to the topography of the land, it is not possible to completely screen the works from residents along Burntwood Road, Nancy Crescent and Ladywood Road but this is

a temporary scheme and the visual impact will be an improved one once the works are completed.

9. The land as it is at present is a barren and low grade agricultural quality parcel of land and the end result will be a more evenly contoured parcel of land, which is rich in soils and nutrients and will create a more versatile system of agriculture which could include arable cropping. Also a pond and additional tree planting area and hedgerow planting along the boundary to Burntwood Road will further enhance this area and will improve the visual impact of the area in the long term.
10. The pond and wetland area and additional tree planting and hedgerow will improve biodiversity as it will eventually create an area which will attract wetland plant growth and amphibians.
11. The scheme has been reduced to be completed in 12 months and will benefit from long term agricultural use and ecological benefits in the future.

Fennell Green & Bates
October 2008

APPENDIX A

BURNTWOOD ROAD

**GRIMETHORPE
BARNLEY**

**SOILS REPORT
AND PROVISIONAL
AGRICULTURAL LAND
CLASSIFICATION
ASSESSMENT**

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30 November 2007

BURNTWOOD ROAD

1.0 INTRODUCTION

- 1.1 Further to instructions received from Messrs Fennell Green and Bates, Land Restoration and Management Limited have prepared a report on the condition of land at Burntwood Road, Grimethorpe. The land is the subject of a proposed planning application for re-contouring in order to improve drainage by the importation of inert waste and improvement of the agricultural capabilities by thickening the depth of topsoil and using soil ameliorants. The report also assesses the likely Agricultural Land Classification (ALC) grade, but is not a detailed Land Quality Statement. The ALC is provisional in that it is based on only five soil samplings, located to be representative of the site. For an accurate ALC, a more comprehensive network of samples on a 100m grid would be required.
- 1.2 The provisional assessment of the ALC grade was undertaken using the methodology set out in the '*Agricultural Land Classification of England and Wales*' (MAFF, October 1988). The findings in this report are also based upon information from Fennel Green and Bates and published Ordnance Survey maps.
- 1.3 To compile the required data, Land Restoration & Management Ltd undertook a site inspection on 13 November 2007 and this report provides a summary of the condition of the soils at the time of the inspection.
- 1.4 The conclusions reached in this report are necessarily restricted to those that can be determined from the available information and may be subject to amendment in the light of any additional information becoming available.
- 1.5 The content of this report is strictly confidential to the addressee and their client, for the specific purpose to which it refers. No responsibility whatsoever is accepted to any third parties for the whole or part of its contents.
- 1.6 Neither the whole nor any part of our report, nor any reference thereto, may be included in any published document, circular or statement, nor disclosed orally to any third party, without our written approval of the form and context of such publication or disclosure. Such approval is required whether or not Land Restoration & Management Ltd are referred to by name and whether or not our report is combined with others.

BURNTWOOD ROAD

2.0 SITE DESCRIPTION

- 2.1 The subject land at Burntwood Road extends to approximately 4.2 hectares (11 acres) or thereabouts. It is situated on the north eastern edge of Grimethorpe, approximately 14 kilometres (9 miles) SE of Bamsley (see location plan Appendix 1). The land to the north comprises a farmstead and agricultural land. A recreation ground is immediately to the west, while Burntwood Road with associated residential properties lies to the south. The agricultural land in this area is typically large, open, arable or grass fields, mainly bounded by remnants of old hedgerows. A public footpath crosses the land from south east to north west.
- 2.2 The land falls in two directions; to the north at a gradient between 1 in 10 and 1 in 7; and to the west at 1 in 10. However, the centre of the land is dominated by an elongated depression feature with extremely steep side at a gradient of 1 in 2. This area is incapable of being put to beneficial use and is waterlogged or flooded during periods of heavy rain.
- 2.3 A planning application is to be made to import inert waste material, and undertake other works, in the interest of improving the agricultural and ecological qualities of the land. These improvements would mainly be brought about by raising the contours of the lower land and providing an even grade across the site. A specific water body would be created in place of the present periodic flooding which occurs. The restored land will be underdrained with water conducted into the new water body for onward transmission into the local watercourses.
- 2.4 Agricultural use of the land is often interrupted or hindered by the frequency of flooding. The land is presently used for arable crops but the emerging crop was showing signs of stress through the land being partly waterlogged.
- 2.5 The depression area referred to above does not contain a distinct water body, but is boggy and unused. Apart from the occasional trees in the hedgerow along the north eastern boundary, there are no trees on the land.

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3.0 SITE INSPECTION – SOILS

3.1 The site was inspected on 13 November 2007. The weather conditions were dry and overcast. The year had seen rare weather conditions with a wet Spring and heavy, prolonged rainfall at the end of June causing extensive flooding in vulnerable parts of Yorkshire, including the subject land. At the time of inspection, the depression area in the middle of the land was wet and boggy at the surface. The inspection included boring to subsoil level using a Dutch auger and taking topsoil samples only, to be used for nutrient analysis, from 5 random locations within the site. The samples were laboratory analysed for pH and nutrients.

3.2 Nature of the Soil

The topsoil samples were dry and friable.

The soil has a sandy clay loam texture and the pH and nutrients status are summarised in Table 1 below.

Table 1: Soil nutrient status

Sample (see plan for positions)	pH	Texture	Lime requirement Arable Grass T/ha (t/acre)	Phosphorous mg/l (Index)	Potassium mg/l (Index)	Magnesium mg/l (Index)
1	7.6	CL	0 0	20 (2)	189 (2+)	338 (5)
2	6.8	CL	0 0	15 (1)	55(0)	313 (5)
3	6.8	CL	0 0	8 (0)	87 (1)	414 (6)
4	6.8	CL	0 0	10 (1)	66 (1)	403 (6)
5	7.0	CL	0 0	21 (2)	143 (2-)	334 (5)

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- 3.4 To allow efficient uptake and utilisation of nitrogen, crops need to be adequately supplied with other nutrients from soil reserves, fertilisers or organic manures. The soil analysis gives the quantity of available phosphorus (P) and potassium (K) in terms of milligrams per litre of soil (mg/l). These amounts are also expressed as Indices. These indices indicate the relative amounts of nutrients in the soil that are available to the crop, and range from 0 (deficient) to 9 (very large). The MAFF recommendation for optimum agricultural performance is no lower than 2.
- 3.5 The Burntwood Road soils analyses indicate that the topsoil samples were relatively low in plant nutrients P & K. If the landfilling operation goes ahead, it should be borne in mind that storing soils over a prolonged period is likely to result in further deterioration of nutrient status. If possible, the soils should be lifted and quickly respread. Alternatively, storage mounds should be as low as storage space permits, in order to minimise anaerobic conditions. The soils should be re-analysed following resspreading, and manure or artificial fertilisers applied to redress any imbalance.
- 3.7 **Soil Acidity**
- For optimum sward productivity, soil pH should be maintained as near as possible to neutral, as this will help make nutrients more available, improve crumb structure (to help natural drainage), and enhance biological activity in the soil. A slightly acid soil (pH 6.5) is generally considered best for a wide range of crops. The analyses indicate the soil has no lime requirement for agricultural use. The pH can be regularly monitored alongside the nutrients once the soils have been replaced.
- 3.6 **Soil contaminants**
- No request was made to search for contaminants since the likelihood of contamination of the soil is extremely unlikely.

BURNTWOOD ROAD

4.0 AGRICULTURAL LAND CLASSIFICATION

4.1 Map data

The 1 inch to 1 mile provisional Agricultural Land Classification map (published in 1968) indicates Grade 3 as the typical ALC grade for this location. However, this cannot be considered definitive due to limitations of scale and in the light of revised criteria for ALC (1988). Therefore, the main factors influencing ALC grade have been evaluated and the results set out below. As stated previously, the soils information is based on only five samples, rather than a grid network across the site, although the samples are regarded as representative of the site. For this reason, the ALC provided herein is provisional.

4.2 Site limitations

The grade or subgrade of land is determined by the most limiting factor present. When classifying land the overall climate and site limitations should be considered first as these can have an overriding influence on the grade.

4.3 Climate limitations

Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics. The climatic criteria are considered first when classifying land, as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of site or soil conditions.

The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (AT0, January to June), as a measure of the relative warmth of the locality.

The key climatic variables used for grading this site are given in Table 2 overleaf and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

The combination of rainfall and temperature at this site means that, taken in isolation, the overall climatic limitation would be grade 1.

However, other characteristics must be taken into account in order to arrive at a final ALC grade. These are examined below.

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Table 2: Climatic and altitude data

Factor	Units	Values
Grid reference		SE 416090
Altitude	m, AOD	60
Accumulated temperature	day°C (Jan-June)	1393
Average annual rainfall	mm	642
Field capacity days	days	143
Moisture deficit, wheat	mm	103
Moisture deficit, potatoes	mm	93
Overall climatic grade		Grade 1

4.4 Gradient limitations

The site varies between slightly sloping (5-8°) and steeply sloping (26°) which severely limits the use of agricultural machinery. While the slightly sloping land would be graded 1, the steeply sloping land would be ungraded due to the severity of the slope.

4.5 Soil limitations

The main soil properties that affect the cropping potential and management requirements of land are texture, structure, depth, stoniness and chemical fertility. These may act as limitations separately, in combination, or through interactions with climate or site factors. There are also interactive limitations of soil wetness and droughtiness.

4.6 Soil depth

Soil depth is an important factor in determining the available water capacity. Shallow soils affect cropping by influencing the range and type of cultivations that can be carried out and by restricting root growth and nutrient uptake.

BURNTWOOD ROAD

The observed topsoil depths (from auger) were as follows:

1	23cm
2	30cm
3	30cm
4	25cm
5	20cm

The thicker soil of 30 cm occurs across the mid and lower slopes on the north east of the site and would place that part of the land within subgrade 3a while the thinner soil on the higher ground and in the southern and western parts of the site represents a limitation of the ALC to subgrade 3b. There was little stoniness to affect the soil quality.

4.7 Flooding

The incidence of flooding is strongly influenced by topography but the extent, duration, frequency and timing can be difficult to establish precisely. The risk of flooding is significant in affecting the choice of crops that can be grown on the subject land because of the detrimental effects of flooding on the crop yield. This also gives rise to soil management problems.

The Environment Agency flood risk map indicates that land to the north west and downstream from the site is at risk from flooding from surface water conducted away from the subject land. Nevertheless, the ravine area across the middle of the site is often waterlogged and in parts is unsuitable for farming.

- 4.8 Although the potential ALC grade according to most influencing factors is high, the soil depth imposes a limiting factor placing parts of the site into sub grades 3a and 3b, furthermore, the central part of the land is potentially ungraded due to severity of slope rendering it unsuitable for agriculture.

BURNTWOOD ROAD

5 FURTHER OBSERVATIONS

5.1 Improvement

It is considered likely that an improvement to the agricultural quality of the whole site can be achieved as a result of the proposals by the removal of the limitations to agriculture caused by the microtopography of this land. The agricultural quality will be upgraded by thickening the soil depth across the site. It is also considered likely that ecological improvements will be forthcoming from the creation of a defined water body and associated planting.

5.2 Landfilling operation

This represents an opportunity to improve the soil profile and economically to remove limitations to agriculture. However, it is equally important to safeguard the soil resources present within the site by handling those soils in such a way so to minimise structural damage. To make the most of the available soil resource within the site, the operator should carefully remove all available topsoil and the full depth of subsoil.

If possible, stripped soils should be used immediately to restore any areas where landfilling has been completed. Otherwise, the soils should be placed in separate mounds for topsoil, subsoil and soil-forming material (see below). The storage mounds should be as low as space permits. Once constructed, any mounds that are to remain for a lengthy period should be seeded with a suitable low-maintenance grass mixture. In order to prevent weed infestation, the mounds should be given regular applications of appropriate herbicide.

Depending upon its nature and source, it may be possible to screen imported fill for any soil or soil-forming material that can be used as a sub-surface medium.

5.3 Wetland area

The restoration proposals create a water body collecting drainage water and conducting this away from the site in a piped drain. This water control will release most of land that is presently waterlogged and of low agricultural value. Selective planting in the vicinity of the new water body will create a more diverse ecological regime.

Richard F Steadman BSc (Hons) MRICS

Land Restoration & Management Ltd

27 November 2007

APPENDIX B

***Land at Burntwood Road,
Grimethorpe, South Yorkshire***

***Agricultural and Ecological
Improvement***

***Assessment of Environmental
Noise***

for

DTS

by

VIBROCK LIMITED

***Report No. R07.5209/1/PC
Date: 23.10.07***

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1.0 INTRODUCTION

- 1.1 DTS propose to modify the contours across a parcel of land located at Burntwood Road, Grimethorpe in order to achieve agricultural and ecological improvement.
- 1.2 Fernell, Green and Bates, on behalf of DTS commissioned Vibrock Limited to undertake a study of noise from the use of mobile plant undertaking the improvement.
- 1.3 This study benefits from a site inspection and monitoring of environmental noise levels on Wednesday 26th September 2007 at locations considered to be representative of residential properties around the site.

2.0 NOISE TERMINOLOGY

- 2.1 Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air.
- 2.2 Between the quietest audible sound and the loudest tolerable sound there is a million to one ratio in sound pressure level. It is because of this wide range that a noise level scale based on logarithms is used in noise measurement. This is the decibel or dB scale.
- 2.3 Audibility of sound covers a range of about 0 to 140 decibels (dB) corresponding to the intensity of the sound pressure level. The ability to recognise a particular sound is dependent on the pitch or frequencies present in the source. Sound pressure measurements taken with a microphone cannot differentiate in the same way as the ear, consequently a correction is applied by the noise measuring instrument in order to correspond more closely to the frequency response of the ear which responds to sounds from 20 Hz to 20000 Hz. This is known as 'A weighting' and written as dB (A).
- 2.4 The use of this unit is internationally accepted and correlates well with subjective annoyance to noise.
- 2.5 The logarithmic basis of noise measurements means that when considering more than one noise source their addition must be undertaken in terms of logarithmic arithmetic. Thus, two noise sources each of 40 dB (A) acting together would not give rise to $40 + 40 = 80$ dB (A) but rather $40 + 40 = 43$ dB (A). This 3 dB (A) increase represents a doubling in sound energy but would be only just perceptible to a human ear.
- 2.6 The following table gives typical noise levels in terms of dB (A) for common situations.

<i>Approximate Noise Level dB(A)</i>	<i>Example</i>
0	Threshold of hearing
30	Rural area at night, still air
40	Public library
50	Quiet office, no machinery
60	Normal conversation
70	Inside a saloon car
80	Vacuum cleaner
100	Pneumatic drill
120	Threshold of pain

- 2.7 Noise levels can vary with time according to source activity and indices have been developed in order to be able to assign a value to represent a period of noise level variations and to correspond with subjective response.
- 2.8 The L_{Aeq} or A weighted equivalent continuous noise level index is used to average the noise energy over a period of intermittent noise levels. It is the level of steady sound of equivalent energy and is usually referred to as the ambient noise level.
- 2.9 The L_{A90} index represents the noise level exceeded for 90% of the measurement period and is used to indicate the quieter sections of the measurement period. It is usually referred to as the background noise level.
- 2.10 The L_{Amax} index is the maximum root mean square A weighted noise level occurring during the measurement period.

3.0 NOISE CRITERIA

3.1 Introduction

- 3.1.1 The ambient environmental noise at any location will vary according to the activities in progress around that location. In the vicinity of a busy motorway, for example, the noise level will remain fairly constant due to the relatively steady noise input from road traffic, whereas the noise level close to a source of high noise over short periods, such as an airport, will vary over a much wider range. It is therefore necessary to consider how to quantify the existing noise levels in an area in order to accurately assess the acceptability of the introduction of a new noise source.
- 3.1.2 The background noise level, defined as the L_{A90} parameter, represents the noise level exceeded for 90% of a measurement period, or the ninety percentile level. It generally reflects the quieter noise level between noise events and generally ignores the effects of short term higher noise level events.
- 3.1.3 The fifty and ten percentile levels, L_{A50} and L_{A10} , represent the average noise level and the level exceeded for 10% of the measurement period, respectively. The latter, for example, is commonly used to describe and quantify noise from road traffic.
- 3.1.4 The equivalent continuous sound pressure level, or L_{Aeq} parameter, is a measure of the average sound energy over a given time period. It will include noise from all contributing sources. Unless the noise level at the receiving point is perfectly steady, the L_{Aeq} will always be higher than the L_{A90} over any one measurement period.

3.2 Minerals Policy Statement (MPS) 2: Controlling and Mitigating the Environmental Effects of Mineral Extraction in England

- 3.2.1 Minerals Policy Statement (MPS) 2 (Reference 1) is the latest Government advice applicable to the control of noise from surface mineral workings in England and recommends the setting of absolute values for noise limits, linked to daytime, evening and night-time working periods, defined as 07:00 - 19:00 hours, 19:00 - 22:00 hours and 22:00 - 07:00 respectively.
- 3.2.2 Subject to a maximum of 55 dB $L_{Aeq\ 1h}$ (free field), Mineral Planning Authorities (MPAs) should aim to establish a noise limit at the noise sensitive property that does not exceed the background level by more than 10 dB(A).
- 3.2.3 It is recognised, however, in MPS 2 that this will in many circumstances be difficult to achieve without imposing unreasonable burdens on the mineral operator. In such cases the limit should be as near that level as practicable during normal working hours (07:00 - 19:00) and should not exceed 55 dB(A) $L_{Aeq\ 1h}$ (free field).

Temporary Sources of Elevated Noise Levels

- 3.2.4 MPS 2 states in paragraph 2.20 that *"All mineral operations will have some particularly noisy short term activities that cannot meet the limits set for normal operations. Examples include soil stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance. However, these activities can bring longer term environmental benefits"*.
- 3.2.5 Increased temporary daytime noise limits of up to 70 dB $L_{Aeq\ 1h}$ (free field) for periods of up to 8 weeks in a year at specified noise sensitive properties should be considered to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer term environmental benefits to the site or its environs. Where work is likely to take longer than 8 weeks a lower limit over a longer period should be considered.

4.0 SURVEY METHOD

4.1 Introduction

- 4.1.1 The methodology described below was employed during the noise survey. Wherever possible all measurements were undertaken to comply with the requirements of BS 7445: 2001.

4.2 Environmental Noise Measurement Technique

- 4.2.1 At the measurement location the microphone was placed 1.5 metres above the ground and where possible at least 3.5 metres from the nearest reflecting surface. The sound level meter was programmed to monitor over 15 minute periods and the following parameters were recorded:

L_{A90} in dB
 L_{Amax} in dB
 L_{Aeq} in dB

- 4.2.2 Two hour noise surveys were undertaken to estimate the existing noise levels at three locations considered to be representative of residential properties around the site.

4.3 Noise Measurement Locations

- 4.3.1 The noise monitoring locations were as follows:-

Location No	Location
1	Cottage Farm, Grimethorpe
2	Grimethorpe Miners Welfare Sports Field
3	Opposite No. 16 Burntwood Road

- 4.3.2 Cottage Farm is potentially the closest residential property to the north of the parcel of land, but the farmhouse is currently in a state of disrepair and is uninhabited.
- 4.3.3 Grimethorpe Miners Welfare Sports Field lies to the west of the parcel of land and is considered to experience noise levels similar to the residential properties on Cemetery Road.
- 4.3.4 Burntwood Road forms the southern boundary to the parcel of land with numbers 16 to 20 being the closest to the site.

5.0 SURVEY DETAILS

5.1 Instrumentation

5.1.1 The following instrumentation was used for all noise measurements:

Manufacturer	Description	Type
Cirrus	Integrating Sound Level Meter	CRL 831
Cirrus	½" Pre polarised Cond. Microphone	CRL 224
Cirrus	Foam Windshield	
Cirrus	Electronic Calibrator	CRL 511D

5.1.2 The following set-up parameters were used on the sound level meter during all noise measurements:

Time Weighting: fast
Frequency Weighting: A
Measurement Period: 15 minutes

5.2 Calibration

5.2.1 The sound level meter was calibrated with an electronic calibrator prior to commencement and upon completion of the surveys. No significant drift in calibration was observed.

5.3 Survey Dates and Personnel

5.3.1 Noise levels were measured between the hours of 1330 and 1545 on Wednesday 26th September 2007 by Mr P Clayton of Vibrock Limited.

5.4 Meteorological Conditions

5.4.1 Weather conditions were noted during the survey.

Wednesday 26th September 2007

5.4.2 The afternoon on the day of survey was mainly dry but with some rain, 7/10 cloud and a north wind of up to 3 ms⁻¹.

6.0 NOISE LEVEL PREDICTIONS

6.1 Introduction

- 6.1.1 "Noise" has been defined as sound which is undesired by the recipient. The effects of noise on the neighbourhood are varied and complicated, including such things as interference with speech communication, disturbance of work, leisure or sleep. A further complicating factor is that in any one neighbourhood some individuals will be more sensitive to noise than others.
- 6.1.2 A measure that is in general use and is recommended internationally for the description of environmental noise is the equivalent continuous noise level or L_{Aeq} parameter.
- 6.1.3 In general, the level of noise in the local environs that arises from a development site will depend on a number of factors. The more significant of these are:-
- (a) The sound power levels (SWL's) of the plant or equipment used on site.
 - (b) The periods of operation of the plant on site.
 - (c) The distance between the noise source and the receiving position.
 - (d) The presence or absence of screening effects due to barriers, or ground absorption.
 - (e) Any reflection effects due to the façades of buildings, etc.

6.2 Prediction Methodology

- 6.2.1 The prediction method used in this study is based on that outlined in British Standard (BS) 5228: 1997 "Noise and vibration control on construction and open sites".
- 6.2.2 BS 5223: 1997 incorporates recommendations made in Mineral Planning guidance Note 11 (MPG 11) "The Control of Noise at Surface Mineral Workings" which was issued in 1993. MPG 11 proposed several modifications to the 1984 version of BS 5228, the most important ones being the option of calculated barrier shielding rather than estimated shielding; the inclusion of attenuation due to soft ground and; angle of view corrections.
- 6.2.3 The maximum barrier attenuation of 10 dB(A) quoted within BS 5228 can be conservative and is recognised as such in section D.3.2.2.1 where it states "High topographical features and designated and positioned noise barriers could provide greater attenuation". Examples of the former are overburden mounds and excavation high walls, i.e. the quarry face, whilst baffle banks and acoustic fences are examples of the latter.

- 6.2.4 In order to more accurately estimate the barrier attenuation for this study, the method used in the Calculation of Road Traffic Noise (CRTN) has been employed. This document describes a method for estimating barrier attenuation from thin rigid barriers. Thus, for the purposes of this exercise, barrier attenuations have been based on methods within this document to a maximum of 10 dB(A).

6.3 Plant Complement

- 6.3.1 A list of plant sound power levels (LWA's) from which the noise predictions were made are presented in Table 2. The plant complement is based on information provided by DTS. The sound power levels used are either from manufacturer's data or from Vibrock's extensive in-house database of sound power levels measured over the years.

6.4 Noise Prediction Assumptions

- 6.4.1 The noise prediction exercises are based on a number of assumptions concerning the working of the site. These assumptions are presented as follows:-
- 6.4.2 All predictions have been calculated with the combinations of all plant working at the closest point to the prediction location. They are therefore "worst possible case scenarios" which may be of relatively short duration. However, they indicate the maximum L_{Aeq} noise level to which a particular property or group of properties may be exposed during at least some part of the working of the site. By definition, the worst case situation will occur only intermittently over the entire life of the site, thus longer term noise levels perceived outside the site boundary would normally be significantly less.
- 6.4.3 Calculation of noise levels at three of the closest residential properties around the site has been made considering earth movements at closest and greatest distances to these properties.
- 6.4.4 For the purposes of this prediction exercise, the above described worst case situations have been considered at all times. Thus operations are assumed to be undertaken at their realistic minimum and maximum distances.
- 6.4.5 Given that all prediction methods are estimates and that, in practice, measured levels are invariably lower due to the effects of interactions between such things as meteorological conditions and air absorption, these predicted levels are a reasonable representation of the worst case predictions assuming ideal meteorological conditions for sound propagation.

7.0 RESULTS

- 7.1 The results of the noise level surveys undertaken at the closest residential properties to the parcel of land are presented in Tables 1.1 to 1.3.
- 7.2 A list of the mobile plant used on site is presented in Table 2, while Table 3 compares the measured background noise levels with calculated noise levels from site activity at the three locations considered.

8.0 DISCUSSION OF RESULTS

Cottage Farm, Grimethorpe

- 8.1 Inspection of Table 1.1 shows that the background noise level L_{A90} (2 hour) was measured at 40.9 dB L_{A90} (2 hour) with fifteen minute results in the range 36.8 dB to 48.8 dB L_{A90} (15 mins), while the equivalent continuous sound level for the two hour measurement period was 55.6 dB L_{A90} (2 hour) with fifteen minute results between 44.5 dB and 59.2 dB L_{Aeq} (15 mins).
- 8.2 The noise climate at this location is influenced by farm activity and animals and road traffic noise.

Calculated Operational Noise Levels

- 8.3 Site activity is expected to start in the north of the parcel of land when it will be at the closest approach to this location. A one hour L_{Aeq} of 50 dB is calculated at that time.
- 8.4 The recontouring work will move progressively away from Cottage Farm as each phase is worked until the furthest distance is achieved during phase 4 when a one hour L_{Aeq} of 43 dB is calculated.

Grimethorpe Miners Welfare Sports Ground

Existing Ambient Noise Levels

- 8.5 Table 1.2 gives the results of noise level measurements undertaken at this location and shows that the background noise level L_{A90} (2hour) was 48.3 dB with fifteen minute results in the range 46.7 dB to 49.2 dB L_{A90} (15 mins).
- 8.6 The equivalent continuous sound level was measured at 55.1 dB L_{Aeq} (2 hour) with fifteen minute results between 52.8 dB and 56.3 dB L_{Aeq} (15 mins).
- 8.7 This location is subject to noise from road traffic with some building site noise audible on the day of the survey

1 Cemetery Road

Calculated Operational Noise Levels

- 8.8 Properties on Cemetery Road are to the west of the site and are screened by the substantial brick walls around the sports ground.
- 8.9 The closest approach of site activity to properties on Cemetery Road is during work in the west of phase 2 when a one hour L_{Aeq} of 48 dB is calculated.
- 8.10 The greatest distance from Cemetery Road will be during work in the east of phase 4 when a one hour L_{Aeq} of 40 dB is calculated.

No. 16 Burntwood Road

Existing Ambient Noise Levels

- 8.11 Reference to Table 1.3 shows that the background noise level L_{A90} (2 hour) at this location was 46.6 dB with fifteen minute results in the range 44.3 dB to 49.5 dB L_{A90} (15mins).
- 8.12 The equivalent continuous sound level was measured at 58.2 dB L_{Aeq} (2 hour) with fifteen minute results in the range 51.1 dB to 65.0 dB L_{Aeq} (15 mins).
- 8.13 At Burntwood Road noise sources audible on the day of survey included road traffic and building site noise.

Calculated Operational Noise Levels

- 8.14 Recontouring work in phase 1 will occur at the greatest distance to Burntwood Road when a one hour L_{Aeq} of 48 dB is calculated.
- 8.15 Site activity will advance towards Burntwood Road as each phase is worked until the closest approach occurs during phase 4 when a one hour L_{Aeq} of up to 61 dB is possible.

9.0 CONCLUSIONS

- 9.1 A visual survey of the site has been made and existing ambient noise levels measured adjacent to the closest residential properties to a parcel of land off Burntwood Road, Grimethorpe. Measurements were made in terms of L_{Aeq} , L_{A90} , L_{A10} and L_{Amax} thus enabling the existing noise climate to be characterised.
- 9.2 From the results discussed in earlier sections it is apparent that noise levels from most of the recontouring activity:
- (a) Do not exceed the 55 dB $L_{Aeq, 1h}$ criterion, considered a normally justifiable limit.
 - (b) Do not exceed background noise levels by more than 10 dB(A), an alternative criterion stated in the Minerals Policy Statement (MPS) 2.
- 9.3 At the one location where the 55 dB $L_{Aeq (1 \text{ hour})}$ criterion will be exceeded, the recontouring work is an activity associated with the construction of a permanent landform and, as such, should be considered against an increased temporary daytime noise limit given in MPS 2 of up to 70 dB $L_{Aeq (1 \text{ hour})}$ for periods of up to 8 weeks in a year.

10.0 RECOMMENDATIONS

- 10.1 The following are recommended as positive statements of the maximum noise level which could be permitted without giving rise to the likelihood of complaint:
- 10.2 During the permitted working hours the free field Equivalent Continuous Noise Level ($L_{Aeq, 1h}$) for the period, excluding topsoil and subsoil stripping and other works in connection with landscaping, shall not exceed 55 dB (A) or 10 dB ($L_{Aeq, 1h}$) above background noise levels, whichever is the lowest, as recorded at the boundary of any inhabited property.
- 10.3 Topsoil and subsoil stripping and other works in connection with landscaping shall not exceed 70 dB $L_{Aeq, 1h}$ free field at any inhabited property and be limited to a period not exceeding 8 weeks at any one property.

11.0 REFERENCES

1. Minerals Policy Statement (MPS) 2 "Controlling and Mitigating the Environmental Effects of Minerals Extraction in England". March 2005.
2. Planning Policy Guidance Note 24 (PPG 24) 'Planning and Noise', 1994.
3. British Standard Code of practice for Sound insulation and noise reduction for buildings. British Standards Institution, BS 8233:1999.
4. Noise and vibration control on construction and open sites, Part 1. Code of practice for basic information and procedures for noise and vibration control. British Standards Institution, BS 5228:1997.
5. A Guide to the Measurement and Prediction of the Equivalent Continuous Sound Level L_{Aeq} . Noise Advisory Council, 1978.
6. Calculation of Road Traffic Noise. Department of Transport, Welsh Office HMSO.
7. "The Control of Noise at Surface Mineral Workings" W S Atkins Report on behalf of the Department of Environment, 1990.
8. Guidance on the new approach to appraisal, DETR, 2001
9. Minerals Planning Guidance (MPG) Note No. 11 'The Control of Noise at Surface Mineral Workings', 1993.

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Sound Power Levels for land at Burntwood Road, Grimethorpe**
- 3 Calculated Noise Levels at Residential Property
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TABLE 1.1

**ENVIRONMENTAL NOISE LEVELS AT
GRIMETHORPE, SOUTH YORKSHIRE**

Day/Date of Survey: Wednesday 26th September 2007

Monitoring Location : Cottage Farm

Measurement Period	Duration (mins)	Statistical Parameters dB			
		<i>L_{Aeq}</i>	<i>L_{A10}</i>	<i>L_{A90}</i>	<i>L_{Amax}</i>
1330 - 1345	15	59.2	62.1	48.8	69.2
1345 - 1400	15	58.1	60.7	44.0	66.7
1400 - 1415	15	58.7	62.6	39.0	69.5
1415 - 1430	15	49.5	53.8	37.0	67.4
1430 - 1445	15	44.5	45.8	36.8	61.5
1445 - 1500	15	51.9	56.0	39.1	66.0
1500 - 1515	15	47.4	50.7	38.6	66.3
1515 - 1530	15	55.6	58.9	43.6	71.4
1330 - 1530	120	55.6	56.3	40.9	71.4

TABLE 1.2

**ENVIRONMENTAL NOISE LEVELS AT
GRIMETHORPE, SOUTH YORKSHIRE**

Day/Date of Survey: Wednesday 26th September 2007

Monitoring Location : Grimethorpe Miners Welfare Rugby pitch

Measurement Period	Duration (mins)	Statistical Parameters dB			
		<i>L_{Aeq}</i>	<i>L_{A10}</i>	<i>L_{A90}</i>	<i>L_{Amax}</i>
1345 – 1400	15	55.9	59.0	48.1	68.2
1400 – 1415	15	55.6	58.0	49.2	69.2
1415 – 1430	15	53.0	55.4	47.7	64.7
1430 – 1445	15	55.2	58.1	48.1	68.8
1445 – 1500	15	56.3	58.6	48.7	72.1
1500 – 1515	15	55.4	57.7	49.1	68.8
1515 – 1530	15	55.4	58.5	48.5	66.6
1530 – 1545	15	52.8	54.9	46.7	63.9
1345 - 1545	120	55.1	57.5	48.3	72.1

TABLE 1.3

**ENVIRONMENTAL NOISE LEVELS AT
GRIMETHORPE, SOUTH YORKSHIRE**

Day/Date of Survey: Wednesday 26th September 2007

Monitoring Location : Opposite 16 Burntwood Road

Measurement Period	Duration (mins)	Statistical Parameters dB			
		<i>L_{Aeq}</i>	<i>L_{A10}</i>	<i>L_{A90}</i>	<i>L_{Amax}</i>
1345 – 1400	15	56.3	58.7	48.5	73.0
1400 – 1415	15	65.0	62.9	46.4	85.1
1415 – 1430	15	57.9	63.0	44.3	73.5
1430 – 1445	15	52.8	55.4	46.5	64.2
1445 – 1500	15	55.7	58.3	49.5	65.1
1500 – 1515	15	54.4	56.8	47.8	71.6
1515 – 1530	15	52.4	55.6	45.1	61.1
1530 – 1545	15	51.1	54.0	44.4	61.9
1345 - 1545	120	58.2	58.1	46.6	85.1

TABLE 2

**MOBILE PLANT COMPLEMENT AND ASSOCIATED
SOUND POWER LEVELS FOR SITE AT GRIMETHORPE**

<i>Plant Description</i>	<i>Type (or similar)</i>	<i>Quantity</i>	<i>Sound Power Level dB(A)</i>
Bulldozer	Komatsu D5	1	109
Wheeled Backhoe Loader	JCB 3CX	1	105
Road lorries	-	Up to 6 movements per hour	110

TABLE 3

**CALCULATED NOISE LEVELS AT RESIDENTIAL PROPERTY
AT GRIMETHORPE**

Location	Measured Noise Levels (dB)		Calculated Noise Levels (dB)	
	$L_{Aeq(2h)}$	$L_{A90(2h)}$	$L_{Aeq(1h)}$ Phase	
Cottage Farm	55.6	40.9	Closest	Furthest
1 Cemetery Road	55.1	48.3	48	40
16 Burntwood Road	58.2	46.6	61	48