



Dust Consultancy Services and Dust Monitoring

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**DUST MANAGEMENT SCHEME, WHETSTONE BRIDGE
FARM QUARRY, MARSTON MEYSEY**

FOR

MORETON C CULLIMORE (GRAVELS) LTD

**DustScan Ltd
February 2016**

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Plate 3: Photograph looking at site entrance to Roundhouse Farm Quarry

1 INTRODUCTION

Moreton C Cullimore (Gravels) Ltd (Cullimores) has consent to extract and process sand and gravel with restoration to nature conservation uses at Whetstone Bridge Farm, approximately 0.5 km south of Marston Meysey, Gloucestershire. Cullimores currently extract sand and gravel from Roundhouse Farm Quarry which is immediately to the east of the proposed extraction at Whetstone Bridge Farm. The mineral excavation at Roundhouse Farm Quarry is near completion. Consequently, Cullimores have obtained consent to excavate sand and gravel at Whetstone Bridge Farm.

Full details of the proposal are set out in the approved planning application documents. The site has been consented for sand and gravel extraction under application reference 12/0015/CWMAJM. Condition No. 30 for the consent states that a dust mitigation scheme shall be submitted to and agreed by the Mineral and Waste Planning Authority. The approved scheme shall be implemented in full prior to the commencement of development and complied with at all times.

Consequently, DustScan Ltd was instructed by David Jarvis Associates Ltd on behalf of Cullimores to prepare a dust management scheme in relation to potential impacts from dust associated with the proposal.

This report has been prepared with reference to relevant documents and best practice guidance including Process Guidance Note (PGN) 3/08(12)^a.

2 SITE SETTING

Whetstone Bridge Farm (17.76 ha) is located on level ground in a rural setting approximately 0.5 km south of Marston Meysey and 1.5 km to the north west of Castle Eaton in Wiltshire (Drawing No. 1). The primary land cover in the locality is arable farming and grassland. The entire site lies within a flood zone.

Whetstone Bridge Farm is located 0.5 km west of the Roundhouse Farm quarry. The location is currently used for agriculture (Plate 1). The proposed entrance to the site will lead onto Sheepinbridge lane (Plate 2) and will be located offset the road to Down Ampney CP.

The nearest potential receptors are Whetstone Bridge Farm House and Whetstone Cottage which are located approximately 100 m and 130 m respectively to the north east of the site boundary (Plate 1).

Beyond the Whetstone Bridge Farm properties, the nearest potential receptors are at the southern end of Marston Meysey, approximately 0.5km to the north, and Roundhouse farm, approximately 0.5km to the east. Alex farm is approximately 1km to the west of the proposed extraction site.

Whetstone Bridge Farm House and Whetstone Cottage are only partially screened by vegetation but a 3 m soil bund will be constructed between them and the operational

^a Defra (2012) *Process Guidance Note 3/08(12): Statutory guidance for quarry processes*

area prior to mineral extraction. Whetstone Cottage is also partially screened by Whetstone Bridge Farm House itself and is located 30 m further away from the site.

The other properties at Marston Meysey and Roundhouse Farm are partially screened by mature vegetation and are also thought to be at low risk to dust emissions from the proposed mineral extraction at Whetstone Bridge Farm due to distance.

The proposed site plan is shown in Drawing No. 2.

3 PROPOSED OPERATIONS

Cullimores currently excavate sand and gravel at Roundhouse Farm Quarry. The operations at Roundhouse Farm Quarry are nearing completion with the remaining works being mostly restoration. Consequently, the firm is seeking to construct a new mineral extraction site at Whetstone Bridge Farm.

As set out in the Environmental Statement, the site will be quarried for sand and gravel and restored to agriculture and ponds with nature conservation including reconstruction of the Thames and Severn Canal using imported inert fill.

Prior to the commencement of mineral extraction, 2 – 3 m soil bunds will be constructed along the site boundaries including a 3 m soil bund on the north west boundary adjacent to Whetstone Bridge Farm House and Whetstone Cottage (Drawing No. 2). Initial work would also include soil stripping and storage, construction of site access, weighbridge and offices and installation of mineral screening and washing plant and temporary lagoon.

Mineral extraction would commence following the completion of soil stripping. The proposed mineral extraction area is approximately 15.55 ha. The site has a proven sand and gravel mineral reserve of approximately 590,000 tonnes. Cullimores plan to excavate 374,900 tonnes of sand and gravel which at the predicted levels of production (approximately 125,000 tonnes per annum (tpa)) would take approximately 3 years.

A concrete batching plant will be installed at the plant site (Drawing No. 2). The concrete batching facility will be relocated from Cullimores' Dairy Farm site, Ashton Keynes. The batching plant will process some 70,000 tpa from Whetstone Bridge Farm. Most of the aggregate will be supplied by the gravel extractions from the site; although some of Carboniferous limestone will be supplied from Wickwar Quarry.

Restoration and inert fill operations will commence during Phase 3 extraction. By this time, operations at Roundhouse Farm Quarry will be completed. After the completion of mineral extraction at Whetstone Bridge Farm, the site will be restored to agriculture at existing levels with the exception of the clean water ponds (Drawing No. 3). These features will provide additional wildlife habitat.

The total timescale, from initial works to the completion of restoration, is expected to be in the order of 4 – 5 years.

4 DUST DEFINITIONS

'Dust' is generally regarded as particulate matter up to 75 µm (micron) diameter and can be considered in two categories. Fine dust, essentially particles up to 10 µm, is commonly referred to as PM₁₀ and, as set out above, PM₁₀ is measured to agreed standards and forms part of the Air Quality Objectives (AQO).

Coarser dust (essentially particles greater than 10 µm) is generally regarded as 'nuisance dust' and can be associated with annoyance, although there are no official standards (such as AQO) for dust annoyance^b.

Although it is a widespread environmental phenomenon, dust is also generated through many human activities. This includes agriculture (especially arable farming), minerals sites, heavy industry, waste management and road transport.

Dust is generally produced by mechanical action on materials and is carried by moving air when there is sufficient energy in the airstream. More energy is required for dust to become airborne than for it to remain suspended. Dust is removed through gravitational settling (sedimentation), washout (for example during rainfall or by wetting) and by impaction on surfaces (e.g. on vegetative screening). Dust can be re-suspended where conditions allow, such as from bare ground.

Dust emissions from a minerals site, its propagation and potential impacts can be considered in terms of 'source-pathway-receptor' relationships. Dust can arise from a variety of processes and locations within a site and can be difficult to quantify. The common pathway for dust propagation is by air. Dust propagation depends on particle size, wind energy and disturbance activities. Large dust particles generally travel shorter distances than small particles.

5 DUST SOURCES

The quantity and size range of dust likely to be generated at a minerals site depends on the type of material being worked and the processes applied. PGN 3/08 (12) states that dust can arise from a range of processes at minerals sites but these can generally be controlled by recognised practices.

Potential sources or site activities that may give rise to dust at the Whetstone Bridge Farm can be considered in relation to the principal operations proposed:

- Soil stripping, storage and reinstatement;
- Minerals extraction;
- Minerals handling and processing, including screening;
- Bulk powders (cement) handling;
- Inert fill handling and placement;
- Wind scouring of exposed surfaces and stockpiles; and
- Mobile plant (both on and off-site vehicle movements).

^b Note that the expression 'nuisance dust' refers here to 'generally visible particulate matter' rather than specifically and in a legal sense to statutory nuisance, as defined in Section 79 of the Environmental Protection Act 1990.

The site is located in a primarily rural and agricultural area. With the exception of Whetstone Bridge Farm House and Whetstone Cottage, the nearest residents are not within 0.5 km of the site. Consequently, the proposed sand and gravel extraction operations at Whetstone Bridge Farm are not anticipated to give rise to significant dust impacts at off site receptors.

The production of substantial levels of dust is thought to be even more unlikely due to the quarry's location in a Flood Zone and the consequent high moisture content of the deposit.

The various operations are considered further below, with recommended control measures (Section 6, Dust Management Plan). Furthermore, as set out below, in the lifetime of the Roundhouse Farm quarry, located 0.5 km from Whetstone Bridge Farm and also run by Cullimores, there have been no complaints with regards to dust.

5.1 Weather

Weather conditions can have a significant effect on the potential for dust propagation from quarry operations. Of particular importance are wind speed (and direction) and precipitation.

Dust can be carried from a source towards receptors (such as nearby homes and other businesses) according to the strength and direction of wind. Precipitation is recognised to suppress dust and 0.2 mm of antecedent rainfall is considered sufficient to suppress windblown dust for a number of hours.

Table 1 is a summary of wind speeds and associated potential for dust propagation, derived from relevant guidance.

Table 1: Summary of wind speeds and associated potential for dust propagation (after AEA Technology, 2010)

Wind speed (m/s)	Description
Below 0.5	essentially calm, very low potential for dust movement
0.5 – 2	low wind speeds, low potential for dust movement
2 – 6	'average' wind speeds, moderate potential for dust movement
6 – 10	high wind speeds, reasonable potential for dust movement
Above 10	very high wind speeds, significant potential for dust movement

Marston Meysey is at the northern end of Wiltshire in the southern region of England, with generally lower winds than the more exposed areas to the west and north of the UK. The Met Office wind rose for Heathrow is reproduced at Figure 1 to show typical winds for southern England.

WIND ROSE FOR HEATHROW

N.G.R: 5076E 1767N

ALTITUDE: 25 metres a.m.s.l.

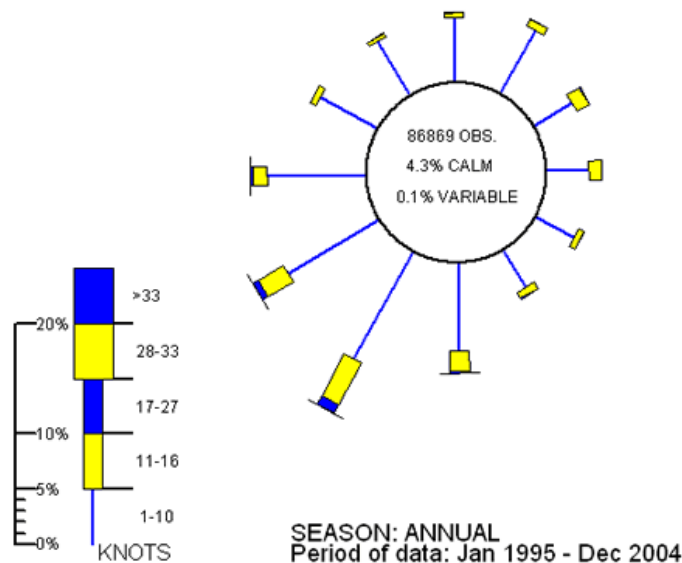


Figure 1: Met Office wind rose for Heathrow^c

Figure 1 shows that, as for the rest of the UK, the prevailing winds for the south of England are south-westerly. Whetstone Bridge Farm House and Whetstone Cottage are located 150 m and 180 m north east of the proposed extraction site; therefore, particular care must be taken to adverse dust impacts at Whetstone Bridge Farm in dry, windy conditions.

6 DUST MANAGEMENT PLAN

As stated in PGN 3/08(12), the extraction of sand and gravel is not a prescribed process. Crushing, grinding, screening and grading of wet materials are not normally likely to result in the release of air particulate matter. In dry, windy conditions however, these processes could potentially cause visible dust emissions. Consequently, this section sets out a number dust mitigation measures for the proposed operations at Whetstone Bridge Farm.

Dust mitigation measures for the Whetstone Bridge Farm can be considered in terms of 'process controls' whereby the dust-generating potential for a specific site process, or activity, is considered and 'operational controls', whereby general guidelines for dust management from the site as a whole are considered.

6.1 Process controls

Standard good practice on dust control at minerals sites is set out in various publications, including PGN 3/08(12). For general materials handling including

^c From Met Office website <http://www.metoffice.gov.uk/climate/uk/regional-climates/ee>

crushing and screening, PGN 3/16(12)^d is appropriate and for concrete batching processes, PGN 3/01(12)^e is relevant.

6.1.1 Soil stripping, storage and reinstatement

There is potential for dust emissions from soil stripping, storage and reinstatement although these are generally short-term, transient operations. Soils would be stored onsite and used in site restoration. Particular care must be taken when creating the soil bund on the north east boundary of the site which is located within 100 m of Whetstone Bridge Farm House and within 130 m Whetstone Cottage.

6.1.2 Minerals extraction

There is a relatively low risk of dust emissions from as-dug mineral excavation although there is a possibility of wind-blow during handling. The risk of dust emissions from sand and gravel extraction at Whetstone Bridge Farm is reduced further by virtue of the quarry's location in a Flood Zone.

The minerals will be extracted allowing dewatering, whereby the water table is lowered locally by pumping into a lagoon. The deposits will reform a high moisture content and cohesion which will be generally unlikely to lead to high levels of dust emissions. Care will be needed during Phase 2 works when sand and gravel will be excavated within 150 m of Whetstone Bridge Farm House and within 180 m Whetstone Cottage.

6.1.3 Minerals handling and processing, including screening

The risks of dust emission from materials handling will vary according to the nature of the materials handled. There is a moderate risk of dust emissions from the screening plant although unacceptable emissions can usually be controlled by ensuring that fitted dust control measures on the plant are properly operational. There is a risk of dust emissions from conveyors, transfer points and at conveyor discharge points onto stockpiles.

Dust can be generated by loading and unloading activities, so drop heights should be minimised wherever practicable. Whetstone Bridge Farm House and Whetstone Cottage are located approximately 200 m and 230 m respectively from the plant site. Activities should be protected from wind to reduce the risk of dust emissions over the site boundary.

A water bowser is used at Roundhouse Farm Quarry to wet down exposed areas as appropriate to minimise dust emissions. A similar dust suppression method will be utilised when appropriate at Whetstone Bridge Farm.

6.1.4 Bulk power (cement) handling

There is a low risk of dust emissions from bulk powder silos except when overcharged or when arrestment equipment fails. Consequently, all alarms, pressure relief valves and filters should be checked in accordance with the maintenance schedule, to

^d Defra (2012) *Process Guidance Note 3/16(12): Statutory guidance for mobile crushing and screening*

^e Defra (2012) *Process Guidance Note 3/01(12): Statutory guidance for cement*

ensure that they are operational, before any filler or other fine powders are discharged from a road tanker into a silo.

The concrete plant will have a dust suppression system fitted to avoid dust when mixing and the cement silos have filters and high level alarms fitted to avoid any dust issues.

The tanker driver should attend the discharge controls throughout and should immediately suspend the discharge operation should any alarm be activated or if a visible emission occurs.

The Site Manager should be informed promptly and no further discharge would take place until the cause of the event has been identified and remedied.

6.1.5 *Inert fill handling and placement*

The risk of dust emission from inert fill handling and placement will vary according to the nature of the material being handled. There is a relatively low risk of dust emission from freshly excavated subsoil whereas there can be a greater risk of wind-blow from dry, unconsolidated soils.

Care will be needed to avoid unacceptable dust emissions when inert material with relatively low moisture content is handled, especially in dry windy conditions.

6.1.6 *Wind scouring of exposed surfaces and stockpiles*

There is a moderate risk of dust propagation from dry surface layers of stripped surfaces, freshly-constructed soil storage bunds, stockpiles and from bare ground. This risk of wind-blow from an exposed surface depends on its location within the quarry. There is low risk of dust emissions from a quarry floor that is located well away from the site boundary but there is a high risk of dust from a discharge point or stockpile adjacent to the site boundary, especially where it is above the height of the site boundary.

In this instance, as noted above, the closest receptors to the site are Whetstone Bridge Farm House and Whetstone Cottage. These properties are located approximately 100 m and 130 m from the north east boundary. Consequently there are no stockpiles or discharge points within 100 m of a sensitive receptor however; the soil bund, located on the boundary adjacent to Whetstone Bridge Farm House be at risk to wind scouring during the construction.

6.1.7 *Mobile plant (both in and offsite vehicle movements)*

There is a risk of fugitive dust emissions from vehicle movements which can be reduced with the application of appropriate mitigation measures.

At Roundhouse Farm Quarry a water bowser is used, and a road sweeper is available to ensure that the surface of the quarry is kept clean. The same measures will be made available at Whetstone Bridge Farm.

All departing HGVs should be sheeted and checked for loose materials that could fall off onto the public highway.

The site entrance at Roundhouse Farm Quarry was kept very clean and well shielded by soil bunds (Plate 3). The site entrance at Whetstone Bridge Farm should also be kept clean and any spillages should be cleared as quickly as possible to reduce track-out onto the public highway. A wheel wash, similar to that used at Roundhouse Farm, will be installed at Whetstone Bridge Farm in order to reduce track-out by vehicles leaving the quarry site. The site entrance will be located approximately 200 m east of Whetstone Bridge Farm House and 230 m east of Whetstone Cottage. Particular care should be taken to reduce track-out from vehicles turning west onto Sheepinbridge lane.

6.2 Operational controls

Good standards should be maintained to reduce unacceptable dust emissions by ensuring that routine checks of plant and machinery are carried out and that regular staff training is provided.

6.2.1 General matters

General matters and the management of the site can affect the likelihood of significant dust emissions. These include:

- use of clean water for dust suppression, to avoid re-circulating fine material;
- high standards of house-keeping to minimise track-out and wind-blown dust;
- a preventative maintenance programme, including readily available spares, to ensure the efficient operation of plant and equipment, and
- effective staff training in respect of the causes and prevention of dust.

As an over-riding requirement, if any operations are identified as causing or likely to cause visible dust emissions across the boundary of the site, those operations will be modified, reduced or suspended until effective remedial action can be taken or the conditions giving rise to the emissions have moderated.

6.2.2 Weather

During dry windy conditions, if any operations are identified as causing or likely to cause visible dust emissions across the site boundary, or if abnormal emissions are observed within the site, operations should be halted or modified until effective remedial actions can be taken and/or the weather conditions giving rise to the emissions have moderated.

6.2.3 Visible dust emissions

All activities with the potential to cause either fugitive or wind-blown dust emissions should be monitored appropriately. This would include a visual assessment of any potential impacts at off-site receptors.

Should visible dust be generated, the source/s of the dust should be identified and the necessary corrective action should be taken.

If necessary, to avoid nuisance impacts at off-site receptors, processes causing visible dust emissions across the site boundary towards a sensitive receptor should be reduced or suspended until the emissions can be controlled.

Site personnel should be empowered to take appropriate action whenever visible dust emissions are observed, or appear likely to occur, as a result of any operation or process on the site.

6.2.4 Complaints procedure

Roundhouse Farm Quarry has never received a complaint regarding dust emissions. In the event of a complaint from a member of the public regarding dust emissions from Whetstone Bridge Farm however, a record should be kept and made available to the appropriate regulatory body as required.

All complaints should be investigated as soon as possible and the complainant kept informed throughout the investigation. The regulator should be informed promptly that a complaint has been received and be kept informed of the results of any subsequent investigation or corrective measures undertaken.

7 SUMMARY

Moreton C Cullimores (Gravels) Ltd have been granted consent to extract sand and gravel, and restore to agriculture and nature conservations land at Whetstone Bridge Farm, Marston Meysey. The site will be operated in a similar manner to the adjoining Roundhouse Farm Quarry, which is nearing completion. This dust management scheme has been prepared as part of the conditions outlined in the application, and has reference to best practice guidance.

The site is located in a rural area predominantly consisting of arable fields and grasslands. There is a relatively low risk of adverse impact from dust from the operations although without mitigation, dust impacts could occur when conditions are such that the risk of dust propagation is increased, such as periods of dry and windy weather.

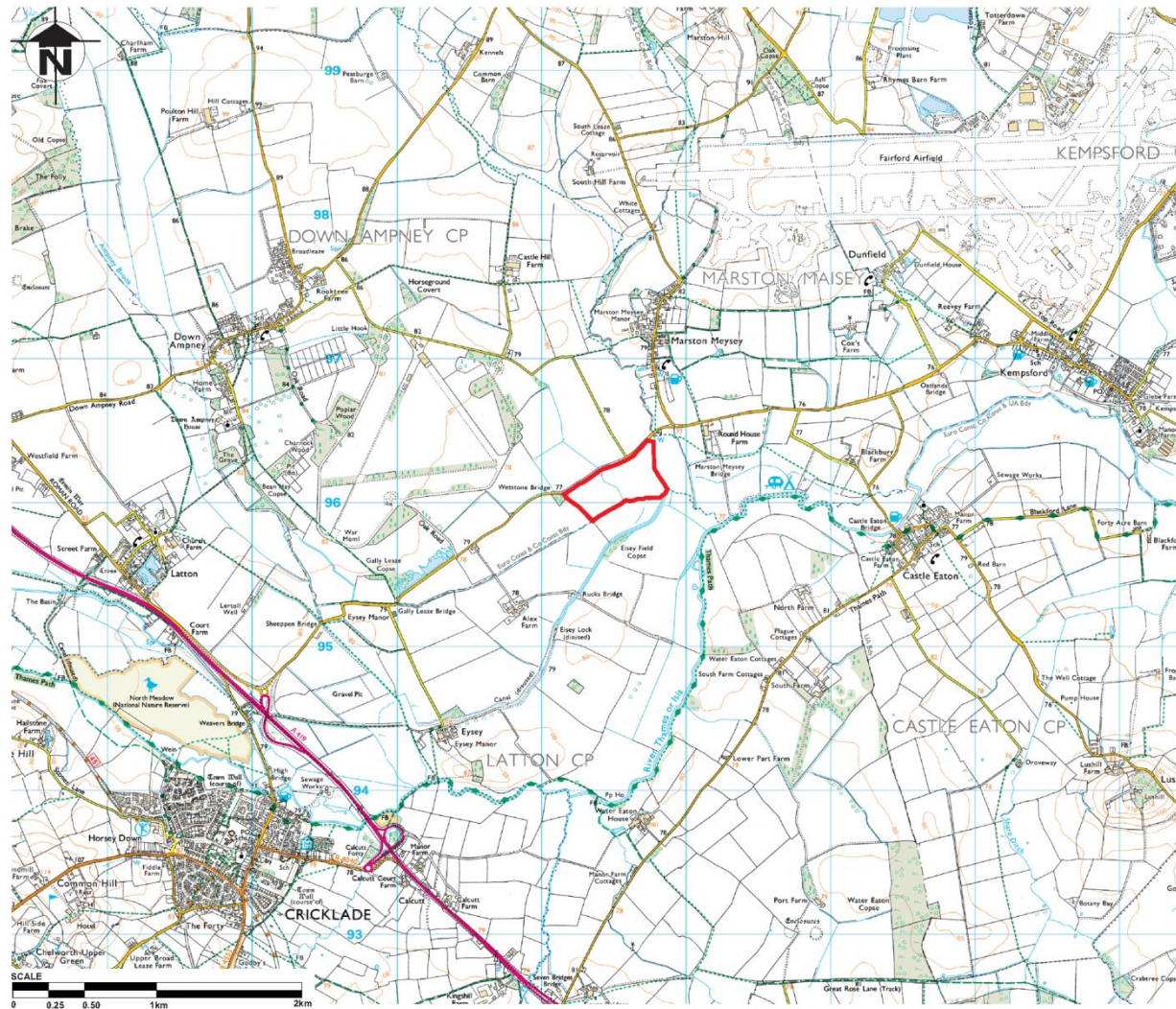
The site is generally well screened by soil bunds and mature vegetation. A comprehensive programme of dust management has been set out for the site, thus it is possible to manage those operations so that provisions could be made to ensure that unacceptable fugitive dust impacts are not caused.

Consequently, the proposed activities at Whetstone Bridge Farm, Marston Meysey, could be operated in a manner unlikely to cause adverse dust impacts in its vicinity.

DustScan Ltd
February 2016

DRAWINGS

Drawing No. 1: OS map, Whetstone Bridge Farm, Marston Meysey



KEY

 **BOUNDARY:**
SITE

Revision: Date: Description:
 A 06-10-14 Site boundary revised.

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 planning development landscape environment

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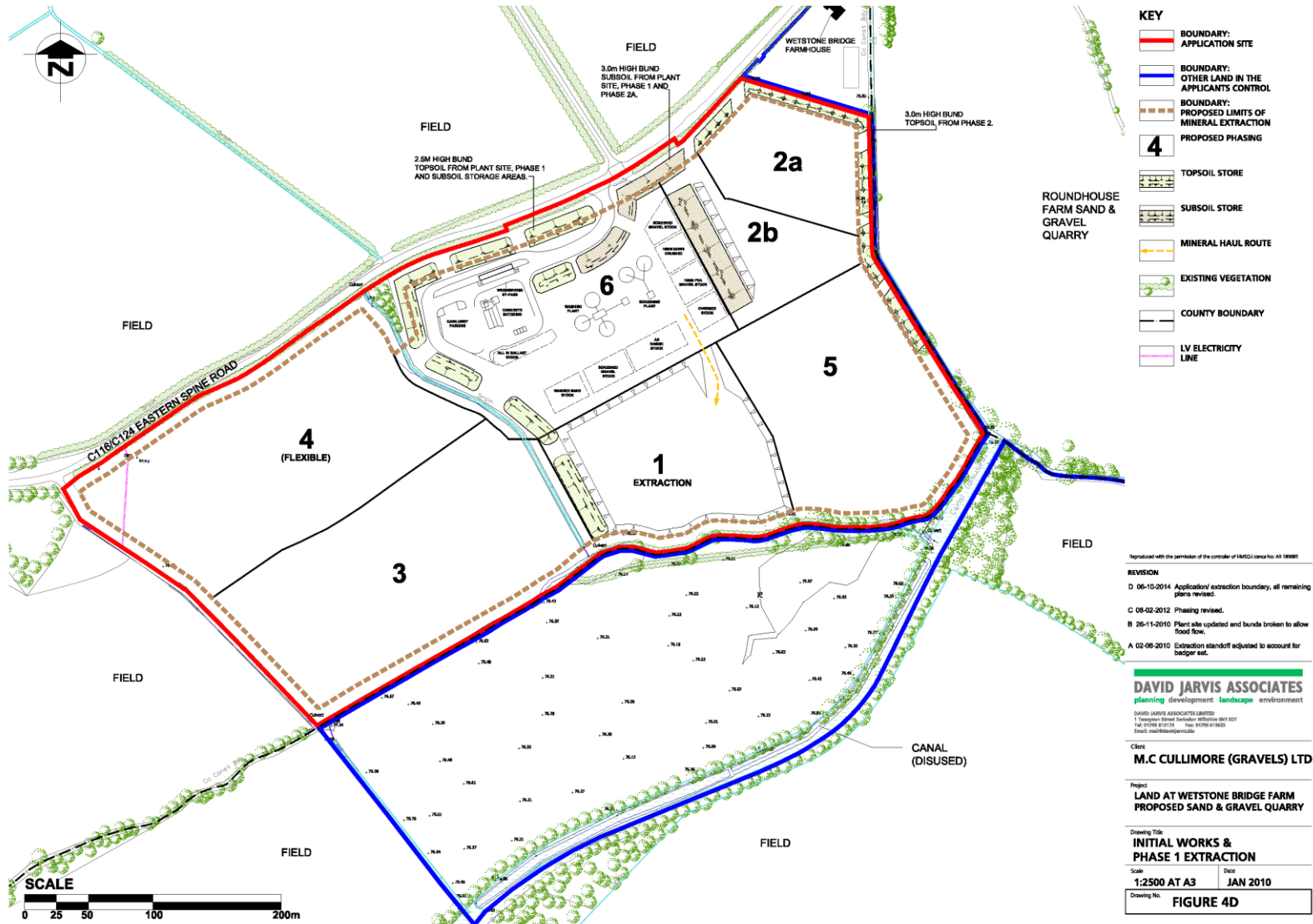
Project: **LAND AT WETSTONE BRIDGE FARM PROPOSED SAND & GRAVEL QUARRY**

Drawing Title: **SITE LOCATION**

Scale: **1:25000 AT A3** Date: **JAN 2010**

Drawing No: **FIGURE 1A**

Drawing No. 2: Site Plan, Initial work and Phase 1 Extraction, Whetstone Bridge Farm, Marston Meysey



Drawing No. 3: Site Plan, final restoration, Whetstone Bridge Farm, Marston Meysey

PLANT SCHEDULE

Hedgerow

Species	Common Name	Age/Pot Size	Height (cm)	%
Acer Campestre	Field Maple	1+1	45/60	10
Cornus sanguinea	Dogwood	1+1	45/60	05
Corylus avellana	Hazel	1+1	45/60	05
Crataegus monogyna	Hawthorn	1+1	45/60	40
Prunus spinosa	Blackthorn	1+1	45/60	30
Rhamnus frangula	Buckthorn	1+1	45/60	10

To be planted in a double staggered row at 300mm spacing, with 500mm between rows in random groups of between 3 and 7 plants of the same species. All plants to be provided with mulch matting and spiral guards supported by canes.

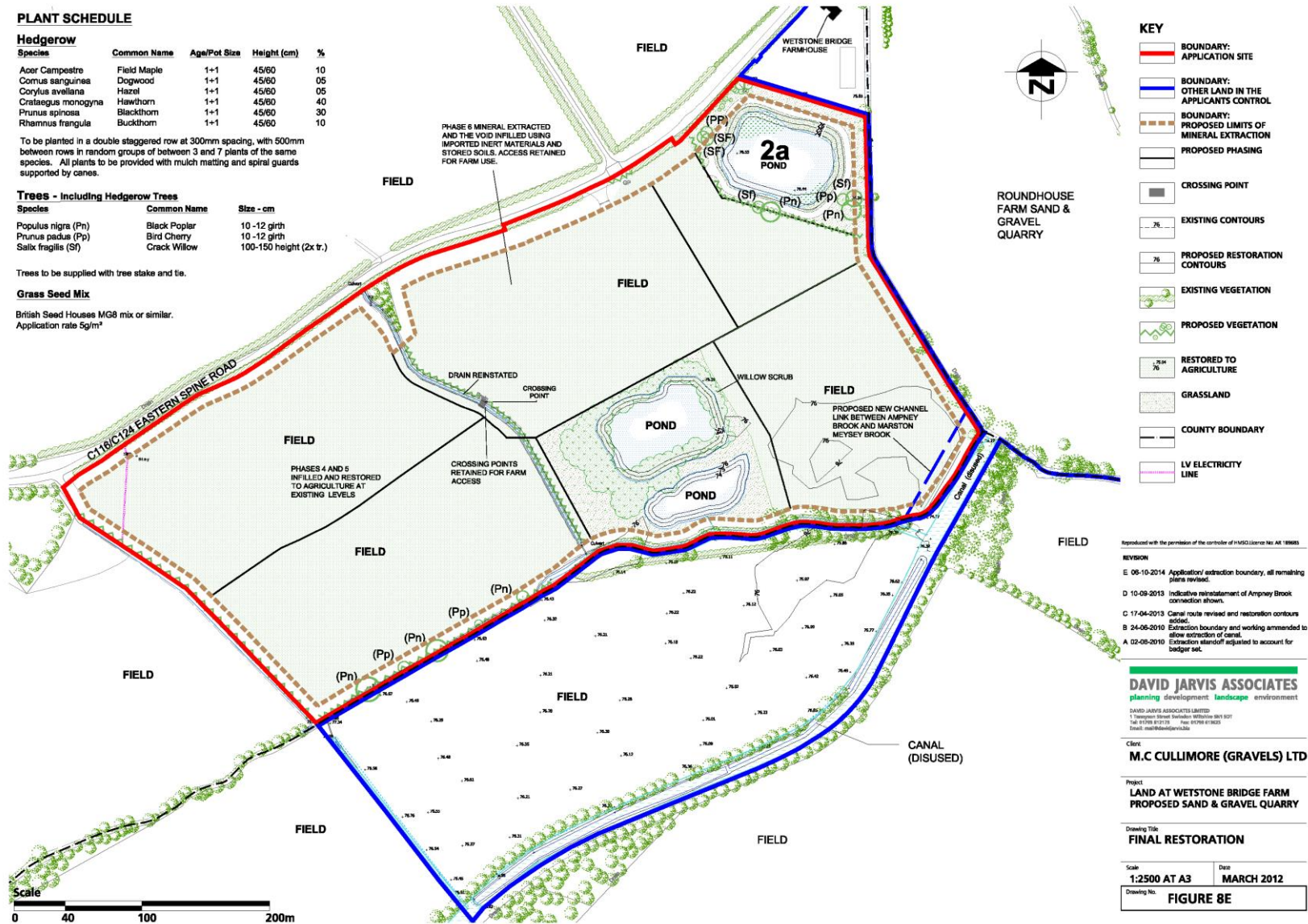
Trees - Including Hedgerow Trees

Species	Common Name	Size - cm
Populus nigra (Pn)	Black Poplar	10 -12 girth
Prunus padus (Pp)	Bird Cherry	10 -12 girth
Salix fragilis (Sf)	Crack Willow	100-150 height (2x tr.)

Trees to be supplied with tree stake and tie.

Grass Seed Mix

British Seed Houses MG8 mix or similar.
Application rate 5g/m²



APPENDIX A



Plate 1: Photograph from north west boundary of the proposed site looking towards the Whetstone Bridge Farm property buildings



Plate 2: Photograph looking south west of proposed entrance of Whetstone Bridge Farm onto Sheepenbridge Lane



Plate 3: Photograph looking at site entrance to Roundhouse Farm Quarry