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METCALFE FARMS

Metcalfe Farm Quarry

Working, Restoration and Aftercare Scheme

February 2023

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Working, Restoration and Aftercare Scheme

February 2023

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DRAWINGS

1 INTRODUCTION

1.1.1 This working, restoration and aftercare scheme has been prepared to a support a discharge of condition application to North Yorkshire County Council in order to develop the quarry in accordance with extant planning permission for mineral development which was originally granted in July 1963 ('2/4/588'), but which was later consolidated with other adjacent permissions as part of a review of mineral conditions submission, resulting in permission C1/78/412/MR. This permission includes several pre-commencement conditions that need to be discharged before works on site can commence. Condition 8 requires that a working scheme be developed (including restoration) and Condition 32 requires an Aftercare Scheme. Condition 8 requires that the following information is included:

- The order, direction and phasing of working operations;
- The method of working and plant used;
- The location, design and appearance of any fixed plant and buildings;
- The location and maximum height of all mineral and processed material stockpiles;
- The location and design of any screening bunds (including their treatment), mineral waste deposits and stockpiles of soil or overburden; and
- The phased and separate stripping of all topsoil, subsoils and any overburden from the area to be excavated, the plant site and the access.

1.1.2 This report details how the quarry will be worked and restored and the short and long term management of existing adjacent habitats to be retained and protected during the development, habitats to be created in advance of the quarry operations and the proposed habitats to be created as part of the restoration scheme for the quarry.

1.1.3 Drawings NT14232/108 to 111 illustrate the phasing of the quarry and drawing NT14232/112F illustrates the restoration plan for the Quarry.

1.1.4 A consultation response from the County Council Principal Landscape Architect was received on 19 May 2022 requesting the following additional information and clarification:

- Landscape and Visual Assessment (LVA to GLVIA3); to guide suitable mitigation and restoration and help minimise adverse effects (proportionate and focussed on key issues).

- Cross sections to show relationship between the site, receptors at nearby properties and roads; proposed mitigation and restoration; full width and depth of the quarry.
- Soil management plan; with stripping and storage volume calculations, locations marked on a plan. Double handling between working phases should be avoided. Where soil is used for progressive restoration, this should be explained on the phasing plans and final restoration plan.
- Clarify standard of agricultural restoration to be achieved (ALC grade).
- Clarification / details of temporary processing compound and its access during initial phases of enabling works and access formation; to be sufficiently screened and allow working access.
- Landscape restoration scheme; incorporating mitigation screen planting, soil retention and re-use, variation of void and flanks, boundary treatments such as fences and walls (with details to be included in each relevant application).
- Long-term maintenance and management plan – provided as Section 5 of this report.

1.1.5 This report and the accompanying drawings have therefore been revised to address these points. Additional drawings NT14232/114 and NT14232/115 are provided to illustrate the restoration of the rock faces.

1.1.6 Further comments have also been received from the County Council Principal Landscape Architect and Planning Officer which have subsequently been addressed within our revised submission.

2 BACKGROUND INFORMATION

2.1.1 Wardell Armstrong were commissioned by Metcalfe Farms to undertake a range of environmental surveys prior to submitting the discharge of conditions application.

Ecology surveys

2.1.2 A Preliminary Ecological Appraisal (PEA) was undertaken to map and characterise the habitats present on site and assess them for the suitability for use by protected or notable species. The site comprises mainly arable farmland, with bare ground, semi-improved grassland, an inactive limestone quarry and scattered trees.

2.1.3 The results of the PEA identified the need for a range of Phase II ecology surveys to include roosting and foraging bats and breeding bird surveys, these were undertaken throughout the 2020 season. A range measures (where necessary) have been provided to ensure that post restoration Metcalfe Farm Quarry will provide a positive

net biodiversity gain on site through retaining, enhancing and creating a diverse range of habitats and priority habitats for the area.

2.1.4 The site lies approximately 1km to the south of the North Pennine Moors Special Protection Area (SPA), therefore a Stage 1 (screening) Habitats Regulations Assessment (HRA) has also been carried out.

2.1.5 Full reports for each species are provided, but in summary:

- The bat surveys found that the site to supports only low levels of activity of common and widespread species. The proposed development is not considered likely to impact significantly on local bat populations.
- Bird surveys found that the site is of no greater than local value to breeding birds.
- The level of site use by qualifying species of the SPA is very low (golden plover or absent (hen harrier and peregrine).

Soils

2.1.6 Wardell Armstrong also carried out a soil survey to determine the soil profiles and depths on the existing site. The Soil Survey report details the findings of this survey and outlines the soil management measures that will be implemented when stripping and storing during operation and replacing the soils on site at restoration.

Geology

2.1.7 According to BGS mapping, the site geology comprises strata of the Carboniferous Period, consisting locally of the Great Limestone, which is exposed in old quarry workings located within the south east of the site. Superficial deposits at the site are thin or absent, comprising glacial till (boulder clay) of generally less than 1.0m thickness.

Site Investigation

2.1.8 Two rotary boreholes were drilled at the site to prove the depth of limestone and install groundwater monitoring provisions, the location of these boreholes is shown on Drawing NT14232/102.

2.1.9 BH01 is located on the west boundary of the site, adjacent the existing farm access track. The borehole proved a thin (0.4m) cover of topsoil underlain by limestone to 28.9m bgl, with sandstone and mudstones continuing to 40m depth. The upper 2.0m of limestone was described as weathered becoming strong below.

2.1.10 BH02 is located on the east boundary of the site. The borehole proved 0.6m of topsoil underlain by limestone to 37.5m bgl, with sandstone continuing to 38.5 depth. The upper 3.5m of limestone was described as weathered becoming strong below.

2.1.11 Standpipe piezometers were installed to the base of both boreholes. The ongoing results of monitoring have shown groundwater at close to 20m bgl.

2.1.12 The results of site investigation have confirmed the continued presence of limestone reserves as proven in Black Quarry to the south and within the existing excavation located within the south east corner of the site.

3 WORKING SCHEME

3.1 Introduction

3.1.1 It is estimated that the extraction area contains approximately 1.7 million m^3 of limestone, which would be worked at an average rate of 142,000 m^3 per annum, with an estimated duration of 12 years with a further year for the site to be fully restored.

3.1.2 The site area is 11.8ha and the extraction area is 5.1ha.

3.2 Pre-commencement works

Site access

3.2.1 The site access is subject to a separate planning permission. This would be a new point of access to the northern quarry area linking it with existing routeways wholly within the landowner's ownership at Washfold Farm to serve the overall farmstead as well as the quarry. To the north of the quarry a cutting would be created to access the quarry, as shown on drawing NT14232/107D.

Advanced woodland planting

3.2.2 Prior to works commencing, it is proposed that woodland planting takes place to the north of the site and along the western side of the site access. Planting works is to commence on receipt of confirmation that the planning conditions have been discharged. This will help to screen views into the quarry from the residential properties to the north.

3.2.3 Advanced woodland planting would also be carried out at the south-western corner of the site and along Whipperdale Bank outside the site to the west to screen views into the site from Whipperdale Bank. This would tie into the recent planting at the Quarry Barn. It is acknowledged that this is unlikely to provide a sufficient screen of

the initial works and early phases of the quarry, therefore a temporary screening bund would also be installed along the inside edge of the planting to provide the initial screening, this would be seeded with an appropriate grass seed mix.

3.2.4 Additional advanced woodland planting would also be planted in areas outside of the planning permission boundary to the east and west, as shown within the Proposed Phasing Plan drawings.

3.2.5 It is intended that the woodland planting would be maintained in perpetuity, thereby becoming a local asset to both the ecological interest and the character of the landscape.

3.2.6 The woodland belts would be 10m wide minimum, they would consist of a central band of canopy trees approximately 5m wide minimum, with a narrow approximately 2.5m minimum band of sinuous shrub planting either site, which would soften the edges to reduce the linear appearance of the screening belts. Post and wire stock-proof fencing would be installed along the boundaries of the planting and/or the plants will be protected by individual tree/shrub guards.

3.2.7 The planting mix is given in Table 1. Tree and shrub species to be planted in groups of 5-10 at an average 2.5m spacing (varying between 2m to 5m), within staggered wavy lines.

Table 1: Advanced Woodland Planting

SPECIES	COMMON NAME	Size (cm)	Specification	%
Betula pubescens	Downy Birch	40-60	B, 1+1	20
Quercus robur	Common Oak	40-60	B, 1+1	20
Pinus sylvestris	Scots Pine	30-40	C	10
Sorbus acuparia	Rowan	40-60	B, 1+1	10
Alnus glutinosa	Alder	40-60	B, 1+1	5
Corylus avellana	Hazel	40-60	B, 1+1	20
Crataegus monogyna	Hawthorn	40-60	B, 1+0	10
Ilex aquifolium	Holly	30-40	C	5

3.2.8 The trees and shrubs would be planted between November and March during their dormant period. Young plants would be protected from damage by browsing wild animals using suitable biodegradable tree guards. Species required to be supported by stakes would be checked annually to ensure no damage has occurred.

3.2.9 Pre-planting, the areas would be rotovated and a bark mulch applied to reduce the growth of competitive weeds at least 3 weeks prior to planting.

3.2.10 In order to ensure that healthy, vigorous growth is achieved in newly planted trees and shrubs, the following specification would be applied:

- all planting stock supplied would be in accordance with BS3936 and would be the best quality of their respective kind;
- all plant stock would be supplied from a reputable nursery which can supply species of local provenance where possible;
- all plant material would be healthy, vigorous and sound transplanted nursery stock with well-formed fibrous root systems and well-formed heads; and
- plant material to be free from pest and diseases, undamaged and any containers free from weeds, prior to planting.

3.2.11 The trees and shrubs would be notch planted, with the exception of the holly and pine which would be pit planted, and protected using 1.2m high tree tubes or guards constructed of a biodegradable material and/or post and wire fencing.

3.2.12 Ground flora will be allowed to develop naturally.

3.2.13 This advanced woodland planting would form part of a wider network of ongoing woodland planting at Washfold Farm adding to the landscape structure and biodiversity of the farm. For example, planting has been recently carried out to the east of the site which would help to further screen views of the site from Yarker Bank Farm to the east.

Dry stone walls

3.2.14 The stone from the walls that need to be dismantled during extraction will be used to build new walls along the site boundaries where they are not currently present. Where there is a shortfall of stone, field boundaries would be formed by fence lines.

Soil stripping

3.2.15 Prior to extraction works taking place in each phase, topsoils, subsoils and overburden will be stripped and stored in separate mounds along the perimeters of the extraction area to form the screening bund in the south-west and the quarry edge protection bunds.

3.2.16 Any topsoil or subsoil placed in storage for longer than six months or over winter will be seeded with low growing and low yielding grass mixture to ensure stability and reduce risk of erosion. Most soil bunds will need to be seeded to reduce erosion risk

and improve stability, as they will be in storage until final restoration. The grass will be maintained by cutting at least twice a year and herbicide would be applied if needed. The bunds will have a maximum height of 2.2m.

3.2.17 Soil resources to be used in restoration will be handled only when sufficiently dry. No soil handling will take place between the period of the 30th November and the 1st April, unless agreed with the Mineral Planning Authority.

3.2.18 Machinery movements on wet topsoil will be avoided.

3.2.19 The Soil Survey report outlines the soil management measures that will be implemented when stripping and storing during operation and replacing the soils on site at restoration. All soils stripped from the site would be used in restoration, none would be removed from the site.

3.2.20 Soil restoration of the agricultural land would aim to achieve ALC grade 3b.

Site compound, plant, buildings and stockpiles

3.2.21 During site enabling works and formation of the quarry access, the site compound will be located at existing surface level. The exact location of the compound would be temporary during this phase of working until such time that the full depth of excavation has been achieved towards completion of Phase 1. However, the location of the compound will remain within this part of the quarry throughout the life cycle of the quarry.

3.2.22 There is no requirement for buildings or fixed plant on site as existing farm buildings will be used as a site office and welfare facilities, there is also an existing weighbridge at the farm.

3.2.23 Material stockpiles will be generally limited to no greater than 6m in height, these would be located south of the compound during initial phases and within the void at later phases.

3.2.24 The mobile plant required is listed in Table 2.

Table 2: Equipment

Equipment	Example of type	Number
Soil Strip & Bund Construction		
Excavator	Volvo 380	1
Articulated Dump Truck	Volvo A30F	2
Bulldozer	Cat D5	1
Mineral Extraction and Processing		

Table 2: Equipment		
Equipment	**Example of type**	**Number**
Excavator	Volvo 480	1
Mobile Crusher	Custer Gippo FDR 130	1
Mobile Screen	MckoskyM190	1
Wheel Loader	Volvo L180H	1
Drill Rig	Atlas Copco L6	1

3.3 Mineral extraction

3.3.1 It is proposed that the site will be worked in four phases, as illustrated in Drawings NT14232/108 to 111 and described below.

3.3.2 The site will be worked through as two benches with the maximum depth of excavation being c.20m below ground level, but ranges between c.15-20m per phase. A summary of cumulative volumes has been provided within each Proposed Phase Plan.

3.3.3 The extraction area will be protected by a minimum 1.5m high safety bund to meet safety standards stipulated in the Quarries Regulations 1999. The excavation will also be secured with a stock-proof post and wire fence, 1m high and in accordance with the current BS1722-2.

Phase 1

3.3.4 Phase 1 is in the north of the site and follows on from the creation of the site access, working in a southerly direction.

3.3.5 Topsoils and subsoils stripped from this phase will be stored to the south of the extraction area in separate bunds, as shown on Drawing NT14232/108.

3.3.6 There is approximately 167,000m^3 of saleable reserves within this area, which will be worked over a 2 year period.

Phase 2

3.3.7 Phase 2 continues in a southerly direction with a further 337,000m^3 of extraction over a 2-3 year period.

3.3.8 Topsoils and subsoils stripped from this phase will continue to be stored to the south of the extraction area in separate bunds, as shown on Drawing NT14232/109.

3.3.9 Progressive restoration of phase 1 is not possible as the site compound is located within the phase 1 void.

Phase 3

3.3.10 Phase 3 moves the extraction over into the north-west of the site working in a north-westerly direction, extracting approximately 519,000m^3 of limestone over a 3-4 year period.

3.3.11 Topsoils and subsoils stripped from this phase will be stored in the perimeter bunds shown on Drawing NT14232/110, although the majority going directly into the restoration of phase 2.

Phase 4

3.3.12 Phase 4 then extracts the south-western corner of the site working in a southerly direction, extracting approximately 681,000m^3 of limestone over a period of 2-3 years.

3.3.13 Topsoils and subsoils stripped from this phase will go directly into the restoration of phases 2 and 3. Towards the end of this phase there will no longer be the requirement for the screening bund in the south-west, this will therefore be removed to make way for the extraction of the underlying rock and the soil will be used in restoration.

3.4 Method of working

3.4.1 The limestone will be extracted using blasting techniques. An excavator would then feed the mobile crusher, to reduce the material size to less than 75mm with further grading as dictated by market demand. The aggregates will be placed in stockpiles within the processing/compound area. Movement of materials in and out of the stockpiles will require the use of front-loading shovels.

3.4.2 All material stockpiles will be located in the base of quarry.

Blasting

3.4.3 A blast vibration assessment has been undertaken to guide how blasting activities and mitigation measures would take place, as part of the planning permission.

Hydrogeology

3.4.4 Limestone will be extracted under 'dry working' conditions, with the lowest point of extraction remaining above the level of groundwater. No surface water will enter the extension area. Precipitation will be directed to a sump from where it will be allowed to infiltrate into bedrock with no discharge to off-site water bodies.

3.4.5 The site lies within a Fluvial Flood Zone 1 with a low flood risk.

3.5 Hours of operation

3.5.1 These will be in accordance with Conditions 14 to 16 which state:

"14. Except for the operation of the roadstone coating plants, pumping, maintenance or blasting, or except with prior written approval of the County Planning Authority, no mineral operations shall take place except between the following times:

0600 to 1800 hours Mondays to Fridays

0600 to 1300 hours Saturdays

No operations shall take place on Sundays, Bank or Public Holidays.

15. The stripping and/or replacement of soils or overburden and the formation and/or removal of soil or overburden bunds shall not take place outside the following hours without the prior written approval of the County Planning Authority.

0800 to 1800 hours Mondays to Fridays

0800 to 1300 hours Saturdays

No operations shall take place on Sundays, Bank or Public Holidays.

16. Except in case of emergency, no blasting shall take place except between the following hours:

0900 10 1600 hours Mondays to Fridays

0900 to 1300 hours Saturdays

No blasting shall take place on Sundays, Bank or Public Holidays."

3.6 Traffic movements

3.6.1 The operational quarry will require 24 HGVs in and 24 out per day.

3.7 Employment

3.7.1 The quarry will employee approximately 5 employees.

3.8 Invasive non-native species

3.8.1 The site may be vulnerable to colonisation by invasive species. In the event that any become established and deleteriously effect the target habitats, management will be undertaken, as required, using approved control methods.

3.8.2 No invasive species have been recorded on site during Extended Phase I Habitat Surveys. The arrival of invasive species on the site will be monitored throughout the

extraction and restoration phases and the subsequent management phases, as detailed in Sections 3.9 and 5.

3.8.3 In the event that an invasive species is recorded on site or in adjacent land (within 50m) suitable control methods will be implemented as follows:

- The areas will be clearly marked out and areas that do not need to be disturbed will be fenced off.
- Areas that must be disturbed will be cleared of infested material as far as reasonably possible under supervision of an Ecologist. An assessment will be made as to whether it is better to retain the infested material on site for restoration within the infested area coupled with treatment or whether disposal offsite is more appropriate.
- Areas where infested materials have been identified will be cleared methodically with on-going assessment of the extent of infested ground. Only essential vehicles will be present in these areas.
- In areas of the site where invasive species have been identified, use of tracked machinery will be limited until infested areas have been cleared and/or identified and cordoned off.
- On leaving areas of the site known to contain infested material, any machinery or vehicles that have been used will be thoroughly cleaned (e.g. sterilised and cleaned) within a designated area. This area will be as close as possible to the infested area on which the machinery/vehicles have been working to avoid the spread of the species. Runoff will be contained to avoid spreading plant material. This area will be monitored in the spring for any growth and a spraying programme/management will be implemented as necessary. Any machinery used in clearing infested areas will be similarly cleaned.
- Infested spoil will only be placed on top of a fabric/membrane in an approved, fenced area. Once the infested material is removed from these areas, they will be monitored for re-growth, particularly during the growing season and, if necessary, treated with an appropriate herbicide.
- No stockpiling of potentially infested material will take place within 10m of a watercourse.
- All haulage lorries, dumpers, bags or skips carrying infested material will have the material covered during transit.
- Where infested material is to be removed from site this will have accompanying waste

transfer documentation, for disposal in a licenced landfill site.

- Where application of herbicide is required as part the control this would only be undertaken by suitably qualified individuals (i.e. NPTC certified) and after obtaining all relevant permissions and consents from Environment Agency (for application near to water courses).
- Any areas of invasive species growth, treatment areas, bunds created for management of invasive species or buried invasive species will be demarcated on site constraint maps which will be provided to the Planning Authority.
- An invasive species management plan detailing all invasive species found within particular phased working areas and the intended treatment will be provided to the Planning Authority and approved before treatment begins.
- Any records of invasive species will be provided to the local Biodiversity Records Centre and the GB Non-Native Species Secretariat.

3.9 Landscape and visual impacts

3.9.1 The working and restoration of the quarry would result in localised changes to the landscape character, but with the implementation of the advanced planting within and outside of the permission boundary, alongside screening bunds, the perception of these changes would be restricted to the site and the immediate surrounding area only, therefore they would not be substantially adverse.

3.9.2 The main visual receptors likely to the affected by the scheme are road users on Whipperdale Bank and the residents of the properties at Washfold Farm and Yarker Bank Farm, the Quarry Barn on the southern edge of the site it not a residential property. There are no public rights of way in close proximity to the site. It is considered that the advanced planting to the north and south-west, the screening bund to the south-west and existing and recent woodland planting to the surrounding farm would provide sufficient screening to ensure visual impacts would not be substantially adverse.

4 RESTORATION STRATEGY

4.1 Restoration aims and objectives

4.1.1 The key drivers behind the restoration of Metcalfe Farm Quarry are the delivery of tangible landscape and biodiversity benefits, together with the incremental realisation of appropriate nature conservation/biodiversity targets through the creation and

subsequent management of interlinked terrestrial habitats. The overall restoration scheme is shown on Drawing NT14232/112.

Planning policy background

4.1.2 The Minerals and Waste Joint Plan, Policy D10: Reclamation and after use provides the background to the overall aims and objectives for the restoration scheme, relevant sections of the policy are as follows:

"Part 1) Proposals which require restoration and afteruse elements will be permitted where it can be demonstrated that they would be carried out to a high standard and, where appropriate to the scale and location of the development, have demonstrably:

i) Applicants are encouraged to discuss proposals at an early stage with local communities and other relevant stakeholders and where practicable reflect the outcome of those discussions in submitted schemes.

ii) Taken into account the location and context of the site, including the implications of other significant permitted or proposed development in the area and the range of environmental and other assets and infrastructure that may be affected, including any important interactions between those assets and infrastructure;

iii) Reflected the potential for the proposed restoration and/or afteruse to give rise to positive and adverse impacts, including cumulative impacts, and have sought where practicable to maximise potential overall benefits and minimise overall adverse impacts;

iv) Taken into account potential impacts on and from climate change factors;

v) Made best use of onsite materials for reclamation purposes and only rely on imported waste where essential to deliver a high standard of reclamation;

vi) Provided for progressive, phased restoration where appropriate, providing for the restoration of the site at the earliest opportunity in accordance with an agreed timescale;

vii) Provided for the longer term implementation and management of the agreed form of restoration and afteruse (except in cases of agriculture or forestry afteruses where a statutory 5 year maximum aftercare period will apply).

Part 2) In addition to the criteria in Part 1) above, proposals will be permitted which deliver a more targeted approach to minerals site restoration and afteruse by contributing towards objectives, appropriate to the nature, scale and location of the

site, including where relevant:

viii) Achieving significant net gains for biodiversity which help create coherent and resilient ecological networks. Where practicable, proposals should contribute significantly to the creation of the habitats of particular importance in the local landscape seeking to deliver benefits at a landscape scale. This includes wet grasslands and fen in the Swale and Ure valleys and species-rich grassland on the Magnesian ridge".

Biodiversity aims

4.1.3 Metcalfe Farms is committed to protecting and enhancing the value of the quarry for wildlife, not only while it is active, but also during and post restoration.

4.1.4 Habitats & species occurring or with the potential to occur on site that are priority habitats & species ("Section 41 habitats & species" NERC Act 2006) or within the Richmondshire Local Biodiversity Action Plan (LBAP) are listed in Table 3.

Table 3: Biodiversity priority habitats and species and aims for the restoration scheme

Priority habitat	Present on site	To be created	Restoration biodiversity aims
Arable field Margins	x	✓	Retain wider arable margins in re-instated farmland, to provide quality habitat for wildlife on site, increasing feeding opportunities for seed eating birds. Retain arable margins >4m wide.
Upland calcareous grassland	x	✓	Calcareous grassland is to be created around the site periphery adjacent to the retained rock faces. The restoration scheme provides the opportunity to increase calcareous grassland in North Yorkshire and to encourage populations of associated priority species.
Woodland	x	✓	Woodland is proposed to the north and south-west of the site.
Priority species			**Restoration biodiversity aims**
Bats	✓	✓	Provide more foraging and roosting opportunities.
Breeding birds – farmland and upland bird assemblage	✓	✓	To retain existing populations and increase opportunities for breeding and foraging.

Other aims

4.1.5 To restore and enhance the landscape and visual amenity value of the site.

Restoration objectives

4.1.6 In order to meet the above aims, the objectives of the restoration scheme are to create the areas of the habitats and land uses in Table 4, as are illustrated on Drawing

NT14232/112. This will result in a diverse range of habitats and movement corridors for wildlife across the site.

Table 4: Proposed habitats and land uses within Restoration Scheme	
Land use	**Area**
New woodland planting	1.46ha
Calcareous grassland	2.1ha
Agricultural land	3ha

4.1.7 The aim of providing a range of habitats including priority habitats is to increase biodiversity on the site to benefit the species currently present and to enhance the area for associated priority target species, currently absent from site.

4.1.8 Metcalfe Farms will ensure a suitable structure is in place to deliver the restoration and aftercare obligations. In addition, Metcalfe Farms will ensure the scheme receives adequate financial funding and logistical management as well as expertise and advice on nature conservation, habitat creation, establishment, management and monitoring to ensure the restoration objectives are delivered to the highest standard. Prescriptions may be amended as a result of the monitoring observations to ensure that the medium and long terms aims of the scheme are realised.

4.2 The Restoration Scheme

Landform

4.2.1 The restored landform is shown on Drawing NT14232/112 and cross sections through this are shown on Drawings NT14232/107 and 115.

4.2.2 A scree and soil overburden slope that varies around the extent of the quarry void would be created. The slopes would vary around the quarry edge at 1:1 and 1:2 gradients. The location of these areas is shown on NT14232/112. The 1:2 slopes would be planted with shrub and tree planting, whereas the 1:1 slopes would only be planted with scrub.

4.2.3 A jagged quarry face of approximately 6m would be positioned above the slopes which would be created through mineral extraction and blasting activities during the quarry operation. This would not affect the stability of Washfold Lane, as no additional blasting activities would be required to create the restoration profiles.

4.2.4 A chamfer, approximately 3m x 3m would be created at the top of the profile which would be created with an excavator. The material released from this area would contribute towards the slopes at the bottom of the profile. The chamfers would be

planted with scrub and comprise the entire perimeter of the quarry edge, with the exception of the woodland planting in the south western area.

4.2.5 Examples of the profiles can be seen in NT14232/114.

Soil Restoration

4.2.6 The restored soil profiles are listed in Table 5.

Table 5: Restored soil profiles		
Landcover	**Topsoil depth (mm)**	**Subsoil depth (mm)**
Agricultural land	300	600
Calcareous grassland	0	100 over limestone fines

Landcover and land use

4.2.7 The restored quarry would consist of nature conservation and agricultural land uses. Estimated areas of different land uses that would be created within the restored quarry are presented in Table 4 above.

4.3 Methods of Habitat Creation and Planting Specifications

Agricultural land

4.3.1 Land intended for an agricultural after use would either be seeded with an agricultural grassland mix (medium to long-term grass-ley mixture with clover) or entered into arable cropping (wheat – barley rotation). Seeding would be carried out in March to May or September to October, when climatic conditions are suitable for establishment. The restoration of land to agricultural land will aim to achieve ALC grade 3b.

Arable margins

4.3.2 The aim is to retain arable margins ranging from >4m in width, in areas of arable agricultural restoration. The margins will be allowed to naturally regenerate from the natural seed bank to encourage wildlife on arable farmlands and reduce fertiliser and pesticide drift (if used) on conservation grasslands. For more floristically diverse swards within the arable margins a commercial seed[1] can be used (such as cornfield Annuals) and sown.

Calcareous grassland

4.3.3 The skeletal soils at the quarry margins would be sown with an upland calcareous

grassland seed mix[2] comprising 80% grasses and 20% wildflowers, as detailed within Table 6 and Table 7. Best efforts would be made to obtain the species list via the Yorkshire Dales Millennium Trusts (or similar) who resource seeds of local provenance for the Yorkshire area. This mixture is suitable for sowing onto thin lime soils with low fertility. When sowing onto finer/thin upland limestone soils establishment will be slower, but less management is likely to be required. Common rock-rose seed shall be added to the seed mix to benefit target butterfly species.

Table 6: Wildflower component (20%)		
Species	**Common Name**	**%**
Achillea millefolium	Yarrow	0.6
Anthyllis vulneraria	Kidney vetch	0.5
Centauria scabiosa	Greater knapweed	2
Daucus carota	Wild carrot	0.1
Galium verum	Lady's bedstraw	0.7
Geranium pratense	Meadow crane's-bill	0.3
Hippocrepis comosa	Horseshoe vetch	0.2
Knautia arvensis	Field scabious	0.1
Leontodon hispidus	Rough hawkbit	0.1
Leucanthemum vulgare	Ox-eye daisy	2
Linum cartarticum	Fairy flax	0.1
Lotus corniculatus	Common bird's-foot trefoil	0.2
Malva Moschata	Musk mallow	2
Medicargo lupulina	Black medic	0.3
Plantago lanceolata	Ribwort plantain	2.0
Plantago media	Hoary plantain	2.5
Primula veris	Cowslip	0.2
Ranunculus acris	Meadow buttercup	0.5
Rhinanthus minor	Yellow rattle	1.0
Sanguisorba minor	Salad burnet	3.0
Scabiosa columbaria	Small scabious	0.5
Helianthemum nummularia	Common rock-rose	1.1

Table 7: Grass species (80%)		
SPECIES	**COMMON NAME**	**%**
Briza media	Quaking grass	2.4
Bromopsis erecta	Upright brome	2.4
Carex flacca	Glaucous sedge	0.24
Cynosaurus cristatus	Crested dog's-tail	40

[2] Emorsgate Calcareous grassland Mix EM6 to be replicated by the Yorkshire Dales Millennium Trust (or similar).

Table 7: Grass species (80%)		
SPECIES	**COMMON NAME**	**%**
Festuca ovina	Sheep's fescue	16
Festuca rubra	Red fescue	15.2
Koeleria macrantha	Crested hair-grass	2.0
Tristeum Flavescens	Yellow oat-grass	1.76

4.3.4 The results of the soil analysis would dictate the desired sowing rate. Seed distributors often recommend a sowing rate as high as 40kg/ha, and it is considered that nutrient rich soils might require this sowing rate. For nutrient poor substrates 10-15kg/ha is a suitable sowing rate as grass and undesirable species growth is not expected to be as vigorous. Seeds would be sown in September/October.

4.3.5 Newly sown areas would be protected from trampling by people and grazers (including rabbits where possible). Bird scarers would be used after seeding to discouraging seed eating birds.

4.3.6 It is important to note that it can take up to five years to establish a stable grassland community, with early establishment being patchy and 'weedy' in appearance.

4.3.7 To control any flush of annual weeds, within the first year the grassland may require up to four cuts, however, typically, on bare mineral substrate the first cut should be left until mid to late summer, (especially if Yellow rattle is within the seed mix) ,with arisings removed from site. The sward length would ideally be kept at 100mm or below.

4.3.8 The condition of the grassland would be reviewed within 6 months of seeding and any areas which have failed to establish would be re-seeded.

4.4 Public access

4.4.1 There would be no public access to the restored quarry.

5 AFTERCARE AND LONG TERM MANAGEMENT OF THE SITE

5.1 Introduction

5.1.1 Aftercare of the site is important for the successful establishment of the vegetation. Annual maintenance meetings will be held during the 5 year statutory period, on site to review the previous year's management. Data gathered will be used to modify site-specific management as required. The annual maintenance meetings would be attended by representatives from Metcalfe Farms, the Planning Authority, Yorkshire

Wildlife Trust and any other interested nature conservation groups and any relevant ecology/ landscape consultants.

5.1.2 Aftercare will comprise the maintenance of each phase of the quarry over a statutory period of five years to ensure the successful establishment of the target habitats. The aims of the aftercare scheme are as follows:

- management of existing and new woodland;
- repair and maintenance of post and wire fencing and dry stone walls where necessary;
- conservation of the flora and fauna of the newly established species rich grasslands and woodlands through a low nitrogen input regime;
- management/control of invasive species; and
- soil (cultivation, destoning, application of amendments, such as fertilisers and lime) and, if needed, drainage management.

5.2 Management aims and objectives

5.2.1 The long-term management aims and objectives are as follows:

Conserve and develop the amenity value of the restored site to include the following objectives:

1. *Maintain and enhance where possible, the landscape and visual amenity value of the site.*

Conserve and enhance the nature conservation and biodiversity value of the restored site to include the following objectives:

1. *Establish, maintain and enhance areas of species rich grassland habitat.*
2. *Establish, maintain and enhance areas of existing and developing broadleaved woodland habitat.*
3. *Control and removal of weeds and alien species.*
4. *Seek to establish progressively the various habitats on the site.*
5. *Monitor the success of the establishment of new habitats.*

5.3 Roles and responsibilities

Ownership

5.3.1 The site is owned by Metcalfe Farms who have owned and managed the land for generations. They will take on the long term management of the site post-aftercare

and manage the habitats is accordance with this plan. Specialist input will continue to be sought to develop the details of the restoration, to prepare detailed management plans and for monitoring.

5.4 General operations

5.4.1 The following schedules of operations (Table 8 to Table 12) would be implemented from the beginning of the aftercare period and will continue to be implemented as per the following tables for the duration of the aftercare period and in the long term.

Table 8: Maintenance regime carried out on annual basis: General	
Operation	**Frequency**
Each general inspection would include fencing, walls, gates and other site furniture, a scavenge and litter pick (including debris and any other deleterious matter) removing all arisings to contractor's tip, leaving the site in a neat and tidy appearance.	2 visits per year.

5.5 Woodland planting

5.5.1 Woodland planting would be inspected on an annual basis and dead and diseased stock replaced. During the establishment of the planting a 1m diameter weed free area would be maintained around the plants, preferably by maintaining mulch cover to minimise herbicide use. If considered necessary, an appropriate herbicide, suitable for use close to water, would be applied to around the base of the trees, during the growing season (mid-April to end of September) to maintain the weed free area. Applications of herbicide would be assessed during the first 5 growing seasons; alternatively, grass growth would be managed by strimming vegetation during the growing season, avoiding damaging tree stems.

5.5.2 In the longer term, once the proposed woodland has established, management priorities will change to concentrate on initially removing tree guards /protection and enclosure fence maintenance. A cyclical programme of thinning, felling and coppicing with some interplanting will be introduced with the aim of increasing the species and (especially) the structural diversity of the canopy, under-storey layers and a more open, dispersed woodland cover, particularly on the fringes of the woodland areas.

5.5.3 One of the potential threats to these developing woodland areas is the encroachment by non-native sycamore, which, if unchecked, may come to dominate certain sections of the woodland. Provided the development of young sycamore is prevented (by hand pulling of saplings) it is unlikely that serious encroachment will be a problem. However, appropriate regenerating native target species will be retained within the woodland to encourage a diverse age structure.

5.5.4 The trees in the woodland areas will be thinned to leave the canopy trees with an average spacing of between around 6-10m, with interspersed understorey trees; the timing of thinning will be dependent on local growth conditions of the trees. The woodland edges will have been scalloped to form sheltered areas creating a diversity of micro-climates. Scalloped areas along woodland edges attract flying invertebrates; these in turn have the potential to become prey items for bird and bat species. The scalloped and more open canopied edges of the woodland will be maintained (primarily by the selective removal of trees and scrub). Management of these areas - through cutting - will seek to prevent excessive scrub invasion of the grassland areas.

Monitoring

5.5.5 Monitoring of the condition of the trees, with minor management works to remove dead/diseased trees or improve the health of others will be carried out at least once every 5 years.

Table 9: Maintenance regime undertaken for Year 1: woodland planting	
Operation	**Frequency**
Top-up mulch/ translocated herbicide application	2 visits - April, June and September, plus 1 provisional application
Refirming of all plant material where necessary	1 visit – April
Replace shelters and stakes	Where necessary
Pruning of dead and diseased wood. All arisings will be removed to contractor's tip	1 visit – November-March
Replacement planting of dead/dying/diseased plants (maintain species mix specified in Table 4 and Table 5	1 visit – in year 1 and Year 3 November-December

Table 10: Maintenance regime undertaken for Years 2 to 5: woodland planting	
Operation	**Frequency**
Top-up mulch/ translocated herbicide application	2 visits – April and June
Top-up mulch/ residual herbicide application	1 visit – November-March
Refirming of all plant material where necessary	1 visit – April
Replace shelters and stakes	Item where necessary
Pruning of dead and diseased wood. All arisings will be removed to contractor's tip	1 visit – November-March
Beat up planting	1 visit – November-December

Table 11: Long term maintenance regime: woodland planting	
Operation	**Frequency**
Inspection and replacement of tree guards and protective fencing and removal when no longer required	1 visit per year
Tree health inspection, arboricultural works and removal of dead and disease trees and shrubs	1 visit per year

Table 11: Long term maintenance regime: woodland planting	
Operation	**Frequency**
Grassland management within woodland areas by strimming if a dense rank sward of grasses develops	1 visit per year
Any reinstatement will be done so in accordance with the restoration and aftercare specifications in this report	1 visit per year
Woodland thinning, felling and coppicing	To be determined during annual inspection
Hedgerow cutting	Then on 2/3 year cutting cycle, outside bird breeding season
Hedgerow laying and/or coppicing	To be determined during annual inspection

5.6 Calcareous grassland

5.6.1 This would require low input management:

- No artificial or organic manures to be applied.
- No herbicides to be applied with the exception of spot treatment of any undesirable or invasive species.

5.6.2 In the second and subsequent years, management to maintain the diversity of the grassland would involve an annual cut to a height of c.50mm, undertaken each year in late Summer/early Autumn. This maintains the habitat for longer, allowing species to flower and set seed as well as providing more continual foraging resource for invertebrates. Alternatively, a single cut could be undertaken in early spring. The cut material shall be left in situ to dry for 1-7 days to allow cut hay to drop seed prior to removal.

5.6.3 As well as being monitored, assessed and managed throughout the Aftercare Management Period, at the end of this period, an assessment would be made of how well the grassland has established.

5.6.4 Long-term management of grasslands is required to prevent natural succession and the sward becoming dominated by a few aggressive species. Noxious and invasive weeds will be effectively controlled in accordance with best practice.

Monitoring

5.6.5 Monitoring will be undertaken in order to determine if the management prescriptions are adequate in maintaining the structural and species diversity of the sward. Monitoring to take place in year 1 to assess initial success of the reseeding, and every five years thereafter. If monitoring determines that the grassland is deteriorating,

then changes to the management and grazing/mowing regimes will be introduced. Monitoring options include fixed point photographs, and random and fixed point quadrats.

5.7 Agricultural land

5.7.1 Generally, grassland established on the agricultural land would be managed after the first year's growth by:

- taking a single late summer hay or silage crop a year; or
- grazed on a management regime designed to encourage development of the sward and soil profile.

5.7.2 Long-term monitoring of the species composition of the grassland and the ability to respond (with alterations to the cutting/grazing regimes) is very important and would form part of the management regime for the site.

5.7.3 For arable land, this would depend on the choice of crop and farming method used. In any case, good agricultural practice with regards to grazing management, soil cultivation, use of fertilisers, lime and pesticides will be followed. The need for agricultural drainage would be assessed two years after the fields have been created.

Table 12: Maintenance regime: Agricultural land and grass seeded areas	
Operation	**Frequency**
General inspection of: Germination and the establishment of grasses until the mix has shown successful germination and establishment Surface erosion and, where necessary the requirement for intermediate grips to control run-off	2 visits per year or as required for success
Grass cutting	Twice in the first year, annually in the following years or pasture will be grazed
Selective herbicide application or removal by hand pulling of pernicious or notifiable weeds Refer to *The Code of Practice for the Safe Use of Pesticides on Farms and Holdings [PB3528]* for regulations on herbicide application	2 visits per year before onset of seed dispersal or as required for success Site operatives will be trained to recognise the different species
Making good and reseeding dead or damaged areas	Annually
Maintenance regime: Arable crops	
Due to many options possible depending on the crop and farming system used, this will be specified following restoration. As a minimum, good agricultural practice tailored to soil condition will be followed based on advice from an experienced agronomist.	

5.8 Removal of native and non-native invasive species

5.8.1 The site may be vulnerable to colonisation by invasive species. In the event that invasive species become established and deleteriously effect the target habitats, management will be undertaken, as required, using approved control methods.

5.9 Other monitoring

5.9.1 Monitoring will focus primarily on habitats on site. With incidental sightings of wildlife (birds, butterflies etc) recorded whilst on site. The results of protected species surveys will be forwarded to the LPA and any changes incorporated into relevant management plans and/or mitigation plans.

5.9.2 A review will be conducted in the last winter of the aftercare period. The success of the management strategies used in the aftercare period will be assessed and amendments made to the long-term management plan if necessary.

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