Bovey Basin Ball Clay Workings Central Area
Kingsteignton, Devon
Waste Management Plan

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Contents

1 Introduction

1.1 Background

1.1.1 The Site is known as the Central Area and lies within the Bovey Basin Clay Workings to the north-west of Kingsteignton. The Bovey Basin Clay Workings is a complex of 11 operational quarries, 7 of which are operated by Sibelco and 4 of which are operated by IMERYS minerals Ltd.

1.1.2 Ball Clay production in the Bovey Basin dates back to the 17th century. With the conception of the planning system in the 21st century, the area became characterised by a series of planning permissions, reflecting the large number of small independent companies operating quarries and mines at the time.

1.1.3 In 2023 Devon County Council (DCC) approved a planning application for the consolidation of a number of legacy planning approvals for the Central Area Operational Areas (which comprise Southacre, Whitepit and John Acres Lane Quarries) defining the mineral extraction and tipping strategy as one Operational Area. The approved boundary of the Central Area (the 'Site') is as shown below, see Figure 1.1 (based on approved drawing: ST18876-003 – Site Location Plan as referenced in permission DCC/4344/2023).

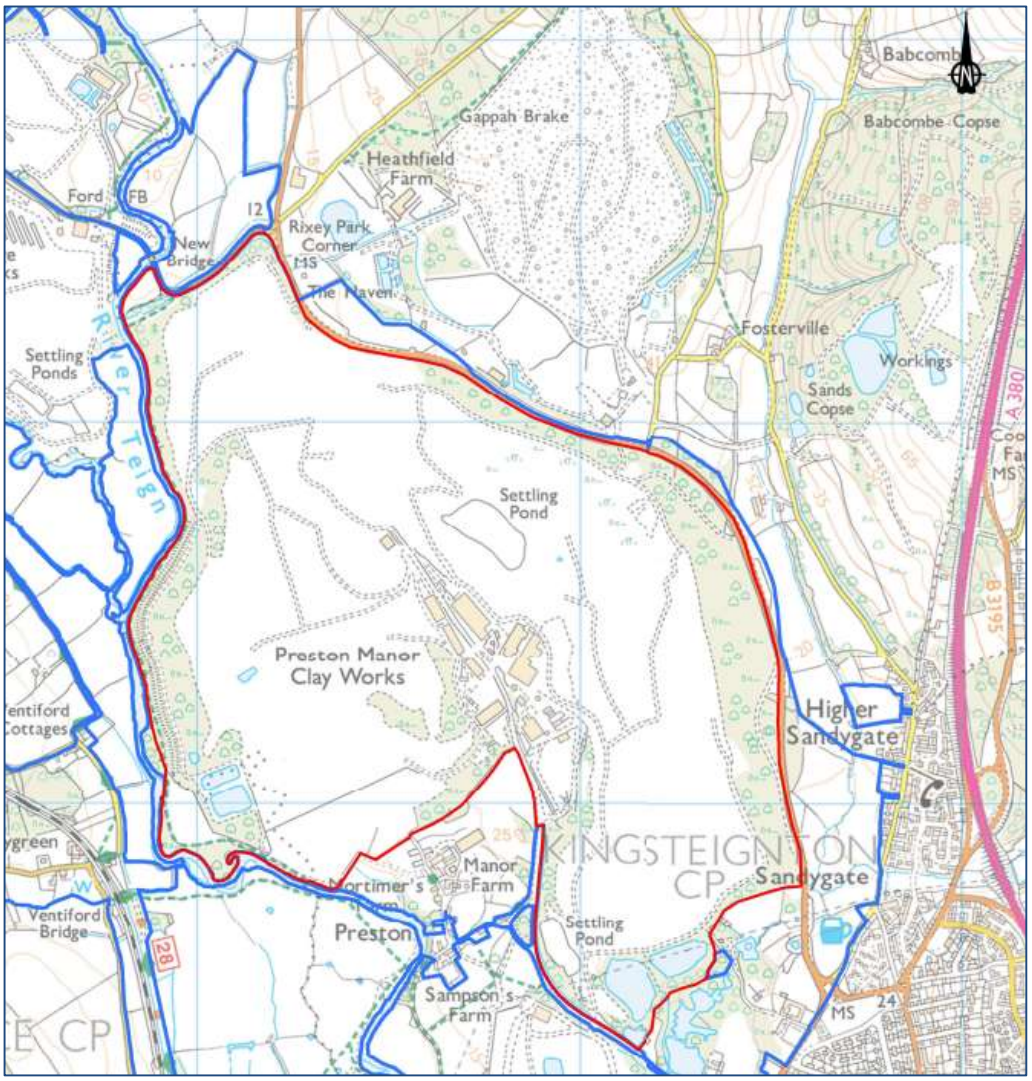


Figure 1.1: Central Area

1.1.4 The Site comprises three operational quarries (John Acres, White Pit and South Acres), the main processing area (Preston Manor Processing Plant), permanent overburden and non-target mineral tip areas (Rixey Park Tip, White Pit Tip, Heathfield Tip and Binney Tip), screening mounds and settling lagoons.

1.1.5 This document comprises an updated Waste Management Plan (WMP) to accompany an Environmental Permit Application for the re-use of mine waste material (i.e. “extractive waste”). The development also involves the import and recovery of waste soils (subsoil and topsoil). It is proposed to incorporate both operations into one permit rather than to have a separate mine waste facility permit and deposit for recovery permit.

1.1.6 This WMP details how Sibelco UK intends to seek to reduce extractive waste production where possible, promotes backfilling of the excavation void in so far as this is in compliance with the planning consent for the Site and ensures the short and long-term safe handling, placement and storage of the extractive waste generated.

1.1.7 Refer to drawing D01/P31/001 appended to this WMP and reproduced as Figure 1.2 below.

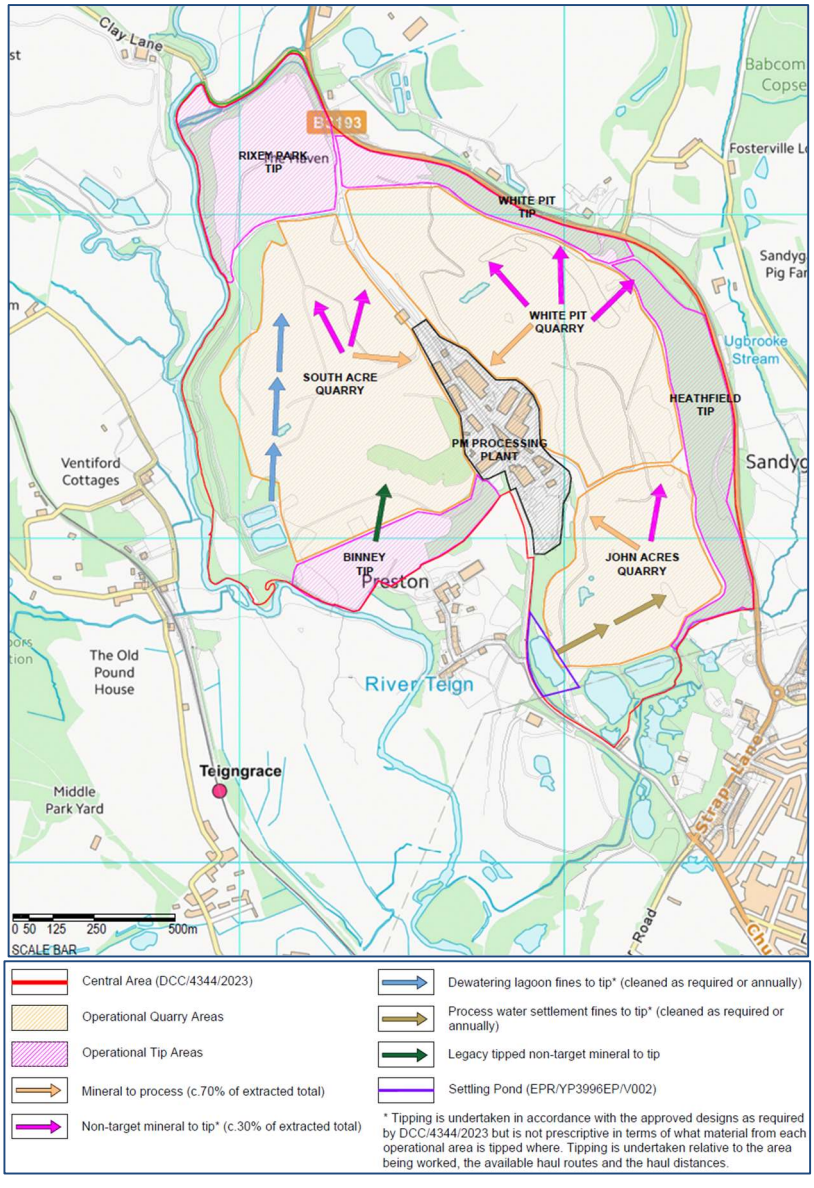


Figure 1.2: Central Area Waste and Materials Management Plan

1.2 Objectives of the WMP

1.2.1 This WMP considers:

- waste management in the design phase and in the choice of the mineral extraction and treatment method;
- the changes the waste may undergo in relation to an increase in surface area and exposure to conditions above ground;
- the return of extractive waste to the void as far as is technically and economically feasible and environmentally sound in accordance with existing Community environmental standards and the requirements of the Directive where relevant;
- replacing topsoil after closure of the mining waste facility where feasible and where not, reusing the topsoil; and
- where chemicals are used to treat the extracted material, the use of less dangerous substances in the treatment of mineral resources.

1.3 Content of the WMP

1.3.1 In accordance with the guidance, a WMP should cover the elements set out below, where they are relevant. For the purposes of this WMP these points are covered, either in this document or by way of cross referencing to the relevant permit application documents:

- the proposed classification of the mining waste facility;
  - where a Category A facility is required, evidence that the major accident prevention policy, safety management system and internal emergency plan will be put into effect;
  - where an operator considers a Category A facility is not required, information justifying this, including an identification of the potential accident hazards;
- waste characterisation in accordance with Annex II to the Directive, and an estimate of the total quantity of extractive waste to be generated;
- a description of the operation generating the waste;
- a description of any treatment of the generated waste;
- a description of the risks to the environment and human health posed by the deposit of the waste;
- a description of the preventative measures to be taken to minimise environmental impact over the life cycle of the mining waste facility including location, construction, closure and aftercare;
- the control and monitoring procedures including for the waste and excavation void where the waste is being returned to the void and for the mining waste facility;
- the proposed plan for closure, after care and monitoring;
- measures for the prevention of water status deterioration in accordance with the Water Framework Directive and for the prevention and minimisation of soil and air pollution; and
- a survey of the land to be affected by the mining waste facility.

2 Materials Management

2.1 Method of Extraction

2.1.1 Mineral is extracted from the Central Area using mechanical excavators. Specific areas or seams of clay are targeted based on drilling and test information alongside customer demand in order to maximise the clays that are within the required specifications.

2.2 Non-target Mineral

2.2.1 As a result of the working methodology there is a proportion of mineral that is 'non-target' mineral (interburden and some overburden) which then has to be managed within the Site to enable continued extraction. This generally amounts to c.30% of total in-situ material. Non-target mineral is extracted and transferred via dump trucks to the approved tipping areas (indicated on Figure 1.2 with pink arrows). Tipping is undertaken in accordance with the contours approved by Devon County Council as set out in the approved planning drawings for permission (DCC/4344/2023) and in line with the periodic geotechnical reviews undertaken as required by the Quarry Regulations. A Stability Risk Assessment (SRA) has been undertaken and is included in the permit application to cover Phases 1 and 2 of the restoration scheme.

2.2.2 The following approved drawings show the phased landform and the restoration plan; these are appended to this WMP:

- ST18876-013 Phase 1
- ST18876-014 Phase 2
- ST18876-015 Phase 3
- ST18876-035 Site Restoration Detailed Landscaping Plan

2.2.3 Non-target mineral is tipped by the dumpers and then bladed out by a dozer. The tip landforms form the basis of the approved restoration of the Site. The non-target material placed directly into restoration (approved tipping areas) does not undergo any changes in relation to an increase in surface area and exposure to conditions above ground as evidenced by the current landforms created as a result of legacy tipping.

2.2.4 Once the landforms are at the correct height and angle (as set out in the approved restoration scheme), soils will be placed where necessary to facilitate planting and habitat creation in accordance with the approved restoration scheme and detailed planting plan.

2.2.5 It is anticipated that during the 15-year period to which the approved restoration scheme relates, the annual tipping volumes are expected to comprise approximately 435,000m^3 of overburden and interburden from the Central Area. It should be noted however that the SRA and the permit application include for Phases 1 and 2 of the restoration (10-year period).

2.2.6 The areas where non-target mineral is placed, as part of the approved restoration scheme, are not considered to be a Category A facility as the material is indigenous to the site and will not contain hazardous waste or dangerous substances, the materials are inert, they do not undergo any processing and there is no foreseen potential for serious environmental harm or harm to human health.

2.2.7 For the purposes of this WMP, the non-target mineral (interburden) is categorised as:

01 01 02 wastes from mineral non-metalliferous excavation.

2.2.8 The Conceptual Site Model (CSM), Environmental Setting and Site Design report (ESSD), Hydrogeological Risk Assessment (HRA), Stability Risk Assessment (SRA)) and Dust Management Plan (DMP) for this project cover the following details where relevant:

- a description of the risks to the environment and human health posed by the deposit of the waste;
- a description of the preventative measures to be taken to minimise environmental impact over the life cycle of the mining waste facility including location, construction, closure and aftercare;
- the control and monitoring procedures including for the waste and excavation void where the waste is being returned to the void and for the mining waste facility;
- the proposed plan for closure, after care and monitoring;
- measures for the prevention of water status deterioration in accordance with the Water Framework Directive and for the prevention and minimisation of soil and air pollution; and
- a survey of the land to be affected by the mining waste facility.

2.2.9 It should be noted that the management of the non-target mineral by tipping as part of a wider restoration of the site is something that has been part of the operation of the quarries and tips that make up the Central Area for many years.

2.2.10 A standalone Environmental Risk Assessment has not been prepared for this project however a summary risk assessment table based on a generic risk assessment for a Standard Rules SR2015 No.39 Environmental Permit is included in Appendix I to the CSM. Risk assessment reports relating to specific receptors identified in the CSM are set out in the Environmental Setting and Site Design report (ESSD). It is noted that the CSM and ESSD are primarily associated with the risks from imported topsoil and subsoil however the extractive waste is considered as a potential source of contamination within these documents.

2.3 Fines / Silts

2.3.1 Layers of sand which occur within the mineral deposit are also selectively extracted and hauled to Preston Manor Processing Works for processing.

2.3.2 Fine sand, silt and clay (tailings) are washed from the inter-seam sand in the processing circuit located at John Acres Lane Quarry. The tailings are, and will continue to be, placed in a settling lagoon to the south of the extraction void. The lagoon is small and shallow (less than 3 metres deep). The lagoon is cleaned out each year and the materials derived are used as part of approved site restoration (indicated on Figure 1.2 with brown arrows). It is estimated that approximately 7,500 m^3 of sand processing fines and silts are generated per year.

2.3.3 The fines / silts are categorised as follows:

01 04 12 tailings and other wastes from washing and cleaning of materials (other than those mentioned in 01 04 07 and 01 04 11)

2.3.4 The management of this waste is covered by an existing Standard Rules Permit (SR2009No8) ref: EPR/YP3996EP_V002. It is proposed to keep this permit separate from the wider restoration operations within the Central Area.

2.3.5 The areas where the fines /silts are placed, as part of the approved restoration scheme, are not considered to be a Category A facility as the material is indigenous to the site (having been washed from the extracted material) and will not contain hazardous waste or dangerous

substances, the materials are inert and there is no foreseen potential for serious environmental harm or harm to human health.

3 Extractive Waste Prevention and Reduction

3.1 Waste Prevention

3.1.1 The overburden and interburden is a natural by-product of the extraction activities due to the sedimentary nature of the deposit and the fact that some materials do not meet the stringent specifications required for production. On this basis it is not possible to prevent the material being generated or remove the need for it be managed as part of operations.

3.2 Waste Reduction

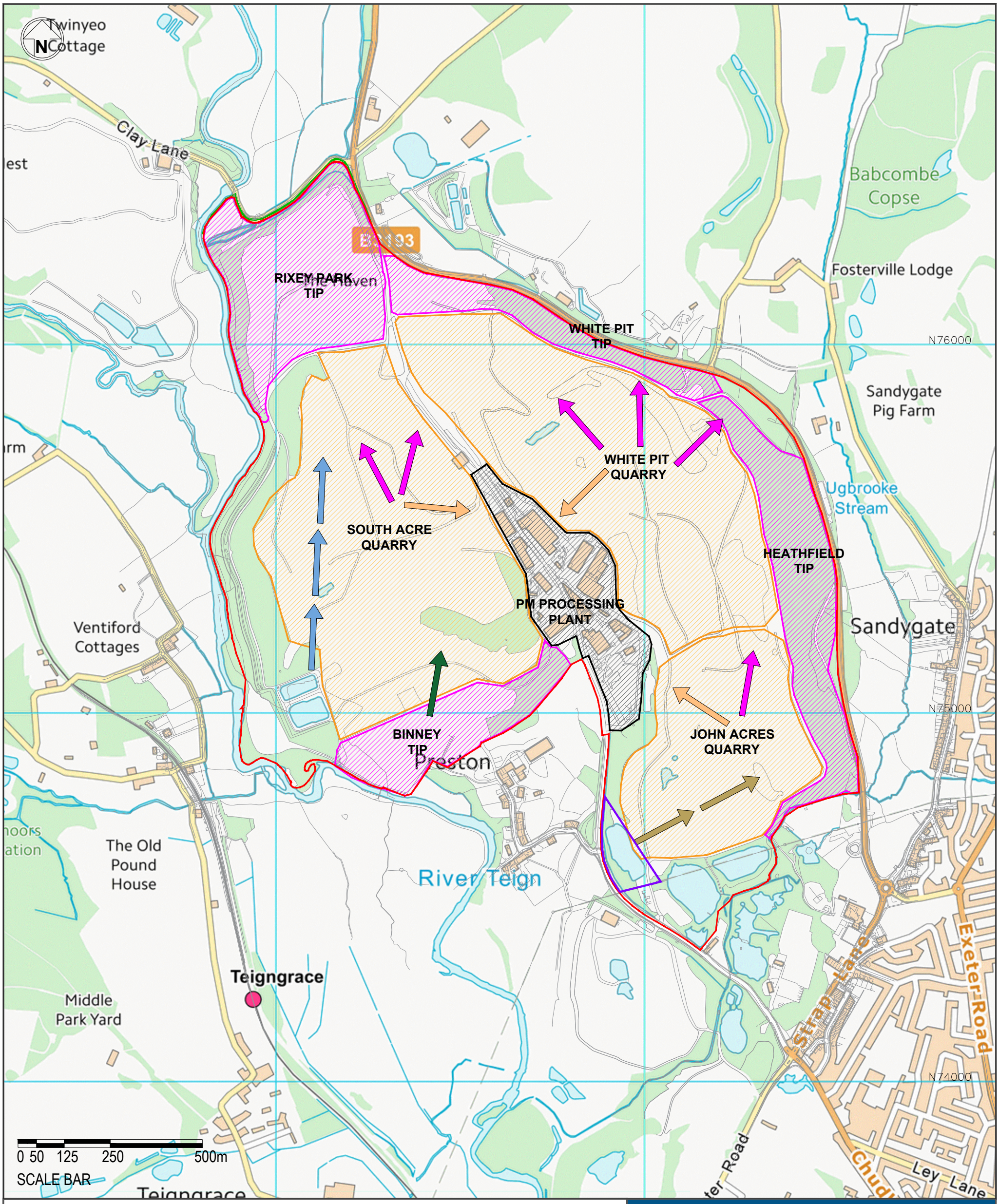
3.2.1 The quarry extraction and processing activities are designed to minimise extractive waste production and, where extractive wastes are generated, these are retained on-site and used in the restoration. It is of commercial interest to Sibelco to process as much target or 'in-spec' mineral as possible thereby reducing the volume of by-product.

3.2.2 The approved planning drawings for the Central Area (DCC/4344/2023) show the development and restoration of the Site over the next 15 years factoring in the use of all materials derived from the Site as part of the final restored landform.

3.2.3 The nature of the site operations and the treatment processes have been designed to maximise saleable product and minimise extractive waste production by consideration of mineral extraction/blending and processing methods. Further notable reductions in extractive waste production are not anticipated due to the nature of the geological strata (i.e. the extractive waste to mineral ratio) and customer specifications for products. The design of the approved restoration is therefore based on the likely volume of non-target material arising as a result of the mineral extraction.

Drawings

D01/P31/001	Central Area Waste and Materials Management Plan
ST18876-013	Phase 1
ST18876-014	Phase 2
ST18876-015	Phase 3
ST18876-035-B	Site Restoration Detailed Landscaping Plan



KEY

- Central Area (DCC/4344/2023)
- Operational Quarry Areas
- Operational Tip Areas
- Mineral to process (c.70% of extracted total)
- Non-target mineral to tip* (c.30% of extracted total)
- Dewatering lagoon fines to tip* (cleaned as required or annually)
- Process water settlement fines to tip* (cleaned as required or annually)
- Legacy tipped non-target mineral to tip
- Settling Pond (EPR/YP3996EP/V002)

* Tipping is undertaken in accordance with the approved designs as required by DCC/4344/2023 but is not prescriptive in terms of what material from each operational area is tipped where. Tipping is undertaken relative to the area being worked, the available haul routes and the haul distances.

Issue	Date	Description

TITLE :

CENTRAL AREA
WASTE & MATERIALS MANAGEMENT

SIBELCO

Sibelco Talke
West Avenue
Talke, Stoke-on-Trent
ST7 1TU

LOCATION	S.DEVON
SCALE	1:10,000@A3
DRAWN BY	RP
DATE	03/25
CHECKED BY	DW / MS
FIGURE NO	

STATUS	FOR INFORMATION	DRG No.	D01/P31/001

E284600

E285400

E286200

N76400

N75600

N74800

-12m

-8m

-24m

-18m

-38m

-25

0

25

50

LEGEND

- PLANNING BOUNDARY
- PRESTON MANOR PROCESSING PLANT
- PHASE 1 EXTRACTION AREA
- ACTIVE PHASE 1 CONTOURS
- CONTOURS WITH POSITIVE VALUES
- CONTOURS WITH NEGATIVE VALUES
- DIRECTION OF WORKING
- DIRECTION OF TIPPING

0 200 400 Meters

REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D
A	FIRST ISSUE	30/1/2023	EL	AY	SR

CLIENT

SIBELCO UK LIMITED

PROJECT

CENTRAL AREA
CONSOLIDATION APPLICATION

DRAWING TITLE

PHASE 1

DRG No.	REV
ST18876-013	A

DRG SIZE	SCALE	DATE
A3	1:8000	30/1/2023

DRAWN BY	CHECKED BY	APPROVED BY
EL	AY	SR

wardell armstrong

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BIRMINGHAM, BOLTON, CARDIFF, CARLISLE, EDINBURGH, GLASGOW, LEEDS, LONDON, MANCHESTER, NEWCASTLE UPON TYNE

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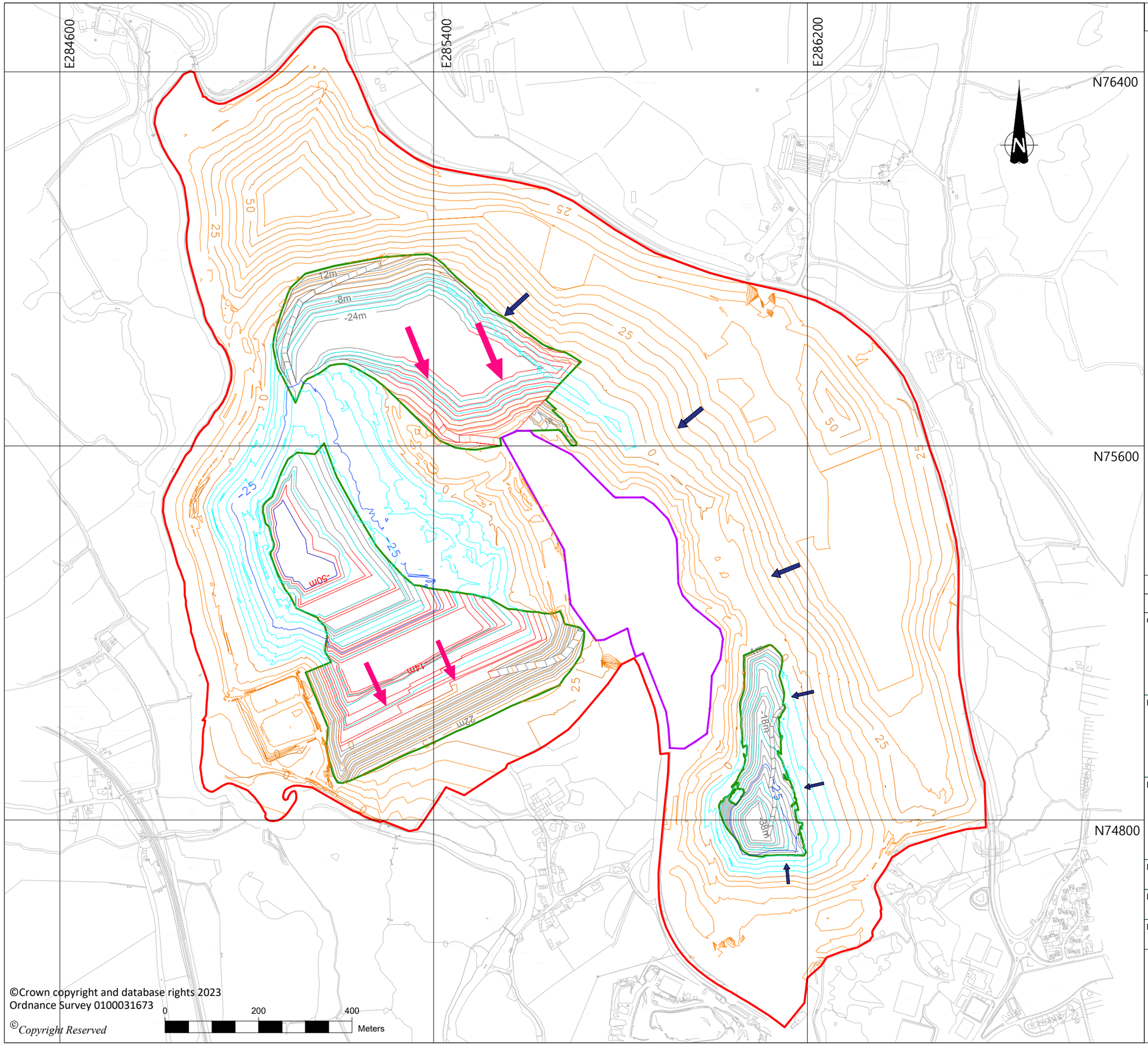

REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D
A	FIRST ISSUE	30/1/2023	EL	AY	SR

CLIENT

SIBELCO UK LIMITED

PROJECT

CENTRAL AREA
CONSOLIDATION APPLICATION

DRAWING TITLE

PHASE 2

DRG No.		REV
ST18876-014		A
DRG SIZE	SCALE	DATE
A3	1:8000	30/1/2023
DRAWN BY	CHECKED BY	APPROVED BY
EL	AY	SR

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E284600

E285400

E286200

N76400

N75600

N74800

LEGEND

- PLANNING BOUNDARY
- PRESTON MANOR PROCESSING PLANT
- PHASE 3 EXTRACTION AREA
- ACTIVE PHASE 3 CONTOURS
- PHASE 2 CONTOURS
- CONTOURS WITH POSITIVE VALUES
- CONTOURS WITH NEGATIVE VALUES
- DIRECTION OF WORKING
- DIRECTION OF TIPPING

Note:-
John Acres quarry has been fully extracted

REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D
A	FIRST ISSUE	30/1/2023	EL	AY	SR

CLIENT

SIBELCO UK LIMITED

PROJECT

CENTRAL AREA
CONSOLIDATION APPLICATION

DRAWING TITLE

PHASE 3

DRG No.		REV
ST18876-015		A
DRG SIZE	SCALE	DATE
A3	1:8000	30/1/2023
DRAWN BY	CHECKED BY	APPROVED BY
EL	AY	SR

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0 200 400 Meters

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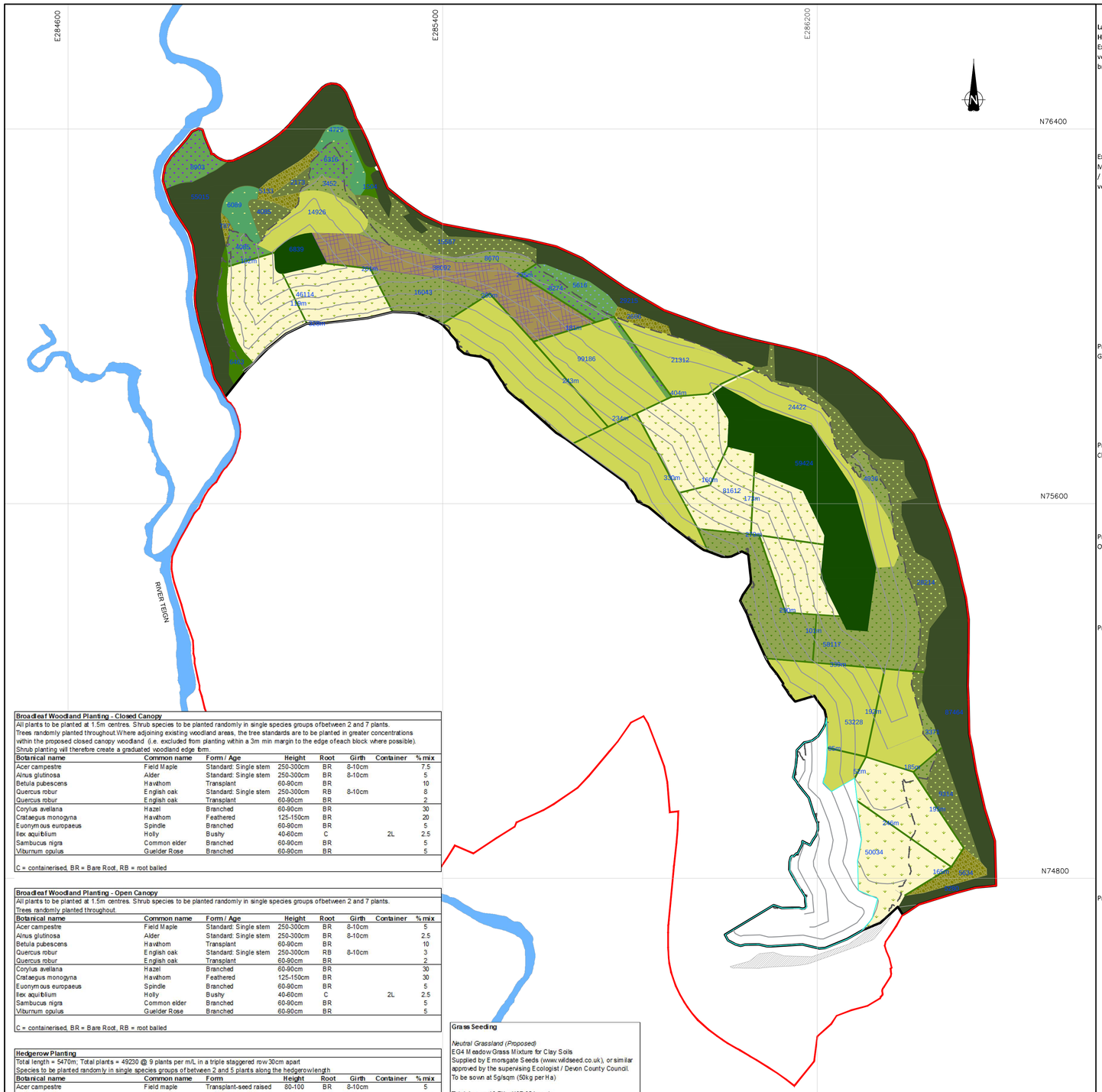

Broadleaf Woodland Planting - Closed Canopy

All plants to be planted at 1.5m centres. Shrub species to be planted randomly in single species groups ofbetween 2 and 7 plants.
Trees randomly planted throughout.Where adjoining existing woodland areas, the tree standards are to be planted in greater concentrations within the proposed closed canopy woodland (i.e. excluded from planting within a 3m min margin to the edge ofeach block where possible).
Shrub planting will therefore create a graduated woodland edge form.

Botanical name	Common name	Form / Age	Height	Root	Girth	Container	% mix
Acer campestre	Field Maple	Standard: Single stem	250-300cm	BR	8-10cm		7.5
Alnus glutinosa	Alder	Standard: Single stem	250-300cm	BR	8-10cm		5
Betula pubescens	Havithorn	Transplant	60-90cm	BR			10
Quercus robur	English oak	Standard: Single stem	250-300cm	RB	8-10cm		8
Quercus robur	English oak	Transplant	60-90cm	BR			2
Corylus avellana	Hazel	Branched	60-90cm	BR			30
Crataegus monogyna	Havithorn	Feathered	125-150cm	BR			20
Euonymous europaeus	Spindle	Branched	60-90cm	BR			5
Ilex aquifolium	Holly	Bushy	40-60cm	C		2L	2.5
Sambucus nigra	Common elder	Branched	60-90cm	BR			5
Viburnum opulus	Guelder Rose	Branched	60-90cm	BR			5

C = containerised, BR = Bare Root, RB = root balled

Broadleaf Woodland Planting - Open Canopy

All plants to be planted at 1.5m centres. Shrub species to be planted randomly in single species groups ofbetween 2 and 7 plants.
Trees randomly planted throughout.

Botanical name	Common name	Form / Age	Height	Root	Girth	Container	% mix
Acer campestre	Field Maple	Standard: Single stem	250-300cm	BR	8-10cm		5
Alnus glutinosa	Alder	Standard: Single stem	250-300cm	BR	8-10cm		2.5
Betula pubescens	Havithorn	Transplant	60-90cm	BR			10
Quercus robur	English oak	Standard: Single stem	250-300cm	RB	8-10cm		3
Quercus robur	English oak	Transplant	60-90cm	BR			2
Corylus avellana	Hazel	Branched	60-90cm	BR			30
Crataegus monogyna	Havithorn	Feathered	125-150cm	BR			30
Euonymous europaeus	Spindle	Branched	60-90cm	BR			5
Ilex aquifolium	Holly	Bushy	40-60cm	C		2L	2.5
Sambucus nigra	Common elder	Branched	60-90cm	BR			5
Viburnum opulus	Guelder Rose	Branched	60-90cm	BR			5

C = containerised, BR = Bare Root, RB = root balled

Hedgerow Planting

Total length = 5470m; Total plants = 49230 @ 9 plants per m/L in a triple staggered row 30cm apart
Species to be planted randomly in single species groups of between 2 and 5 plants along the hedgerowlength

Botanical name	Common name	Form	Height	Root	Girth	Container	% mix
Acer campestre	Field maple	Transplant-seed raised	80-100	BR	8-10cm		5
Corylus avellana	Hazel				8-10cm		30
Crataegus monogyna	Havithorn	Transplant-seed raised	80-100	BR			35
Ilex aquifolium	Holly	Transplant-seed raised	80-100	C	8-10cm		10
Prunus spinosa	Blackthorn	Transplant-seed raised	80-100	BR	1+1		10
Quercus robur	English Oak	Transplant-seed raised	80-100	BR	1+1		5
Rosa canina	Dog rose	Transplant-seed raised	80-100	BR	1+1		5
Hedgerow Standards							
To be planted along the hedgerowlengths at an average of 25m intervals at between 15m and 30m apart.							
Quercus robur	English Oak	Transplant-seed raised	80-100	BR	1+1		/

C = containerised, BR = Bare Root, RB = root balled

Heathland Establishment

A heathland seed source will be provided from mown areas of existing heath. The donor material is obtained as a by-product from heathland management operations such as those to create and maintain firebreaks and to provide areas of heath with differing age structures. Harvesting of donor areas is completed during the early winter months to minimise disturbance to the habitat and while the plants still carry much of their seed. The mowings consist of vegetative parts of the heather plant and, most importantly, the majority of the seed source.
The heathland litter will be spread across the reception area using an agricultural muck spreader towed by a tractor. This will be completed swiftly after harvesting as heathland regeneration has been proven to be much more successful using freshly harvested seed. Only a thin covering of litter is needed across the area as a small amount of litter contains large amounts of heather seed.
The reception area may be over-sown with *Agrostis curtisii grass seed at a light rate of 15kg/ha*. This grass cover is used to help prevent erosion and acting as a nurse crop whilst the heath plants are establishing themselves.

Grass Seeding

Neutral Grassland (Proposed)
EG4 Meadow Grass Mixture for Clay Soils
Supplied by E morsgate Seeds (www.wildseed.co.uk), or similar approved by the supervising Ecologist / Devon County Council.
To be sown at 5g/sqm (50kg per Ha)

Total Area = 10.7Ha (107,021sqm)
Total seed = 535.1 kg

Neutral Meadow (Proposed)
EM4 Meadow Mixture for Clay Soils
Supplied by E morsgate Seeds (www.wildseed.co.uk),
or similar approved by the supervising ecologist.
To be sown at 4g/sqm (40kg per Ha)

Total Area = 2.49Ha (24,847sqm)
Total seed = 99.4 kg

Neutral Meadow Grazed (Proposed)
EM4 Meadow Mixture for Clay Soils
Supplied by E morsgate Seeds (www.wildseed.co.uk),
or similar approved by the supervising ecologist.
To be sown at 4g/sqm (40kg per Ha)

Total Area = 20.4Ha (204,430sqm)
Total seed = 817.7 kg

Landscape Feature / Habitat Type	Description	Key Landscape and Ecological Benefits	Proposed Management
Existing Areas of Woody vegetation and broadleaf woodland	Woodland and scrub native species within the site: establishing areas of planted mixed deciduous native tree and shrub species, and mature established mainly native deciduous with holly woodland with upper canopy and scrub understorey layer below, with native flora ground layer in less shaded some areas.	Important landscape features adding sense of enclosure and landscape value. Possible screening value. Important general wildlife habitat, particularly important for dormice and bat flight routes on edges.	Manage to maintain as mixed woodland containing mature trees with understorey and a ground flora layer. Particularly seek to retain the older, mature trees which are generally of greatest landscape and ecological value, but seek to retain those younger trees which will eventually reach full maturity. Manage the woody nature of young / establishing tree cover to develop into mature woodland. The mosaic of scrub and trees on woodland edges is to be kept. Maintain the woodland edges to continue and encourage as bat flight routes through taller trees whilst having a lower shrub layer particularly beneficial to birds and small mammals.
Existing Grassland, Meadow and Ephemeral / Short perennial vegetation	Grassland is typically dominated by Yorkshire fog with frequent sweet vernalgrass, red clover, broadleaved dock, compact rush, creeping buttercup, ragwort, bird's-foot trefoil, creeping thistle. Unimproved neutral meadow is herb-rich and contains primarily species characteristic of mesotrophic soils. Grasses formed approximately 20% of the sward and were dominated by false-oat grass and cock's foot. Ephemeral habitat has colonised areas which have not been recently disturbed. Vegetation cover is relatively sparse due to the absence of topsoil.	Important ecologically, to enhance the foraging opportunities over the fields proposed for compensation so that bat population security is guaranteed. An ecologically important function for invertebrates and bats. The unimproved meadow habitat was currently analogous with the Priority Habitat: 'Lowland Meadow' and the Devon BAP Habitat: 'Flower-rich Meadows and Pastures'. The habitat was deemed to meet the County Wildlife Site criteria.	Management of the extent of bramble, European gorse and grey willow beginning to encroach into the existing and newly created Meadow areas. Where appropriate, both grassland and meadow can be managed through a hay cutting regimen. Hay meadows should be allowed to grow between March and end of August. Cut should be undertaken when the hay is ready between late July at the earliest and late August. The arisings should be collected and removed. Once cut the meadows should be grazed in combination with the pasture management regime with stock being removed by mid-March at the latest.
Proposed Neutral Grassland and Meadow	Proposed areas on the tip slopes, adjacent to and linking with existing areas of neutral grassland either with topsoil absent or with a range of depths from circa 25mm depth to circa 100mm to 150mm depth on proposed pastures	Important ecologically, to enhance the foraging opportunities over the fields proposed for compensation so that bat population security is guaranteed. New meadow areas enhance existing pockets of meadow, increasing opportunities for species diversity and supporting the John Acres Strip pCWS within the site.	Seek to deliver on-going grazing/hay cropping to maintain and enhance value of existing areas of pasture and lowland grassland in the vicinity. An increased number of pastures managed for grazing would provide increased bat food source. Hay meadows should be allowed to grow between March and end of August. A hay cut should be undertaken when the hay is ready between late July at the earliest and late August. Arisings should be collected and removed. Once cut the meadows should be grazed in combination with the pasture management regime with stock being removed by mid-March at the latest.
Proposed Woodland - Closed	Proposed more dense blocks of native species woodland trees and shrubs located adjoining existing woodland areas.	Landscape function includes screening, visually 'softening' road corridor, adding to the typical local landscape character. Primary ecological function is to reinforce the bat flight corridors where planted within the road corridor and to provide habitat for dormice and other species.	Aim to achieve maturity to woodland with upper tree canopy and with shrub layer below, the edges being shrubbier if possible. Thin as they mature. Seek to achieve and maintain woodland edge function of a flight route for bats and as a habitat for small mammals and birds.
Proposed Woodland - Open	Proposed more open blocks of native species woodland trees and shrubs located on the restored tip slopes and tops within the site.	Landscape function includes wooded blocks within field mosaic of restored tip slopes adding to the typical local landscape character. Primary ecological function is to reinforce the bat flight corridors where planted within the grassland/pasture areas and to provide habitat for dormice and other species.	Aim to achieve maturity to woodland with upper tree canopy and with shrub layer below, the edges being shrubbier if possible. Thin as they mature, with the least dense woodland being at the higher elevations. Seek to achieve and maintain woodland edge function of a flight route for bats and as a habitat for small mammals and birds.
Proposed Hedgerows	Proposed mixed native species hedgerows within the site primarily dividing and enclosing areas of grazed neutral grasland (pasture) comprising shrubs interspersed with hedgerow standards	Important new landscape features adding sense of enclosure and landscape value. Possible screening value. Important general wildlife corridor habitat,particularly important for dormice and as bat flight routes Also, particularly on the restored tip slopes, to rovide and improve shelter from strong winds and increase the value of the pastures to foraging bats when perching (at about 2m from ground level from projecting branches) and hawking (within 5m of linear features)	New hedgerow will create additional hedgerow habitat to enhance the network of commuting and dispersal routes for bats, dormice and other species. The measures described below pertain largely to greater horseshoe bats as maintaining and enhancing commuting routes is key to the conservation of the colony roosting at Chudleigh Caves However, these measures will also benefit other bat species, birds and reptiles. The aim is to improve the quality and extent of flight paths through the landscape and to provide increased hawking and perch-hunting opportunities for bats. To create hedgerows of nature conservation interest, native trees and shrubs that are common in the local area will be planted. Broad hedgerows will be createdby planting shrubs in staggered rows with tree species including oak and field maple. New plants will be adequately protected from stock and rabbit grazing damage through the use of suitable fencing enclosure. Hedges to be managed to create tall, bushy, broad hedges ideally 3-6m in width with an average height of 3m to provide sheltered flight paths and enhanced foraging opportunities for bats when perching and hawking and enhanced nesting habitat for birds. Hedgerow trees to be left to mature. Long term management includes cutting back to both sides to ensure hedgerow doesn't become top heavy and subject to collapse due top basal thinning thus reducing screening ability. Maintain to height suitable for bats to echolocate. Ensure trees planted in hedgerows are not cut back and encourage trees to grow through the hedgerow in suitable locations.
Proposed Pasture	Areas of new neutral grassland enclosed by woodland and hedgerows across the tip slopes to be managed via grazing.	Pastures add to the local landscape mosaic and fulfilling an important ecological function particularly where actively grazed and related invertebrate ecology important as a bat food source. Pastures will each be sub-divided into smaller grazing units with dividing hedgerows. The foraging value of the pastures will be significantly increased by this sub-division into a mosaic of smaller units that are sheltered from wind impacts. These will provide immediate benefits after creation, whilst trees & shrubs planted adjacently, and within the hedge rows, are establishing themselves. Gaps in the hedgerows provided with gates are to be provided to allow stock to either roam among all fields, or be restricted as dictated by the grazing situation. As such although the fields will be small, grazing animals can move between fields as they wish effectively creating larger grazing units if required.	Pasture habitat will be created within those fields described above by a grazing regime of livestock (cattle/sheep) to provide dung that will support dung beetles for the majority of the year. Small numbers of hardy cattle, from July to October, reducing in number from November to April). If sheep-worrying is not a problem, or can be controlled, sheep can be used from October to April. Jacob sheep may be the best choice (stocked at lower numbers over winter, and increasing in summer). A mixture of cattle, sheep and/or horses over winter is preferable. Rotation of animals and fields should assist with parasite control. No ivermectins should be used to treat livestock, and advice should be sought from NE as to the acceptable treatments for any horses. (Ref; Managing landscapes for the greater horseshoe bat. Anon. English Nature 1998.) To support grazing water troughs and shelters for stock will need to be provided at a sufficient density. Stock shelters will provide hanging up night roosts for bats foraging over the fields particularly juvenile bats. Stock shelters should comprise a single, partly open-fronted stock shelter minimum 5m long by 3m wide footprint that is 3m high at the apex will be built. Detailed features to benefit horseshoe bats will be incorporated. The shelter will provide cover in winter for cattle or other grazers and night-roosts for use by both adults and juveniles. They will be especially valuable to juveniles when they first forage, as they will provide security against predator attacks whilst resting between foraging bouts whilst foraging on Aphodius beetles.
Proposed Natural Regeneration / Colonisation	These to be left to recolonize on their own accord (as has already occurred on previously topsoiled tip slopes where restoration has already been undertaken). If natural colonisation of grassland does not occur, or only weak establishment occurs in areas to be used as pasture, overseeding with a suitable agricultural seed mix will be undertaken.	Important landscape element forming part of the mosaic of the tip slopes restoration character.	Manage to seek successful establishment of grassland natural colonisation of tip slopes and pastures, and then monitor how the pattern and types of habitat which occurs as a result of natural colonisation. In particular check on the extent of scrub establishment and how this affects the overall landscape and ecological objectives. It may be necessary to cut back or remove some areas if this is located in an unsuitable location whilst other areas could be left to establish through seer stages, potentially to woodland. During establishment of grasslands, manage to remove invasive/problematic species.

KEY

- SITE BOUNDARY
- Tipping footprint= 64.354Ha (Extent of landscape scheme= 95.074Ha)
- 45.6 New or existing habitat area to be retained or created (sqm) or hedge length (linear metres)
- Neutral Meadow (unimproved) 5616sqm
- Neutral Grassland 59373sqm
- Ephemeral / Short perennial 10815sqm
- Dense scrub 14240sqm
- Broadleaved Woodland 176974sqm
- Natural Regeneration - Proposed 213074sqm
- Neutral Meadow - Proposed 24847sqm
- Neutral Grassland - Proposed 94589sqm
- Neutral Grass (grazed) - Proposed 177760sqm
- Heathland - Proposed 38092sqm
- Woodland (Open) - Proposed 66263sqm
- Woodland (Closed) - Proposed 7967sqm
- Attenuation Pond - Proposed 2731sqm
- Hedgerows - Proposed 4985mL

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D
B	POND REMOVED	06/10/23	SJB	CB	CB
A	FIRST ISSUE	12/01/23	SJB	MP	SR

CLIENT

SIBELCO Ltd.

PROJECT

BOVEY BASIN
BALL CLAY WORKINGS CENTRAL AREA
KINGSTEIGNTON, DEVON

DRAWING TITLE

SITE RESTORATION
DETAILED LANDSCAPING PLAN

DRG No.	REV	SUIT. CODE
ST18876-035	B	

DRG SIZE	SCALE	DATE
A1	1:5000	06/01/2023

DRAWN BY	CHECKED BY	APPROVED BY
KMS	MP	SR

wardell armstrong