Restoration Scheme for Bolton Fell Moss

PART 1

General Particulars

Planning Application Version

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1 Introduction

1.1.1 The restoration scheme documents are in two parts. Part 1 is the written text, but including certain figures and appendices, whilst Part 2 comprises the other plans and drawings referred to in the text of Part 1.

1.1.2 The documents have been prepared by Natural England to set out its proposals for the restoration of Bolton Fell Moss. They are intended to form part of the documentation accompanying a planning application to be submitted by Natural England for the restoration works. In particular the Part 2 plans and drawings are the plans and drawings submitted for planning approval.

1.1.3 Bolton Fell Moss is a lowland raised bog situated in the north of Cumbria, UK. It lies within the parishes of Hethersgill, Walton and Stapleton. A Location Plan showing this general location and the names of the main fields on the Moss is enclosed as Plan 1 in Part 2.

1.1.4 These restoration works are required following the designation of Bolton Fell Moss as a Site of Community Importance ("SCI"). This accords European wide importance to Bolton Fell Moss and places duties on the UK government to restore the moss in accordance with its obligations under European law.

1.1.5 The aim of restoration on Bolton Fell Moss is, through the manipulation of hydrology, removal of non-target vegetation and the reintroduction of target vegetation, to re-establish an active peat forming mire surface within 30 years.

1.1.6 They key to achieving this is to stop peat extraction and to re-establish a water table which will range between 10cm below and 10cm above ground level. The ability to achieve this will depend on the ability to overcome a variety of factors:

- large topographic variations
- thin peats
- degraded peat
- peat dominated by dead roots/wood (from the former woodland which was inundated by the mire)
- cut peat faces
- cambered peat surfaces
- deep drains

1.1.7 Natural England has reached an agreement with the parent company of the main occupiers of the site, William Sinclair Holdings Ltd (WSH), for peat extraction to cease completely by November 2013, by means of a phased programme commencing from March 2010. The works identified in this document, are intended commence following the cessation of extraction.

1.1.8 An initial drop-in day to introduce Natural England's proposals and to field questions from local residents was held in the 28 February 2011 in the Hethersgill village hall. A further public consultation exercise was undertaken detailing the restoration approach through a series of posters displays on the 2nd February 2012. This also included information from the sections of the Environmental Impact Assessment (EIA). Most recently, a presentation on the ecology and examples of restoration was given on the evening on the 26 July 2012.

1.1.9 Natural England has also consulted with all landowners and interested parties through visits and telephone conversations, regarding the management and restoration. The current proposals have been subject to further pre application

consultation before finally being submitted to Cumbria County Council for planning approval.

1.1.10 The remainder of Part 1 is in the following order.

a Section 2 sets out the planning context of this document, listing the other relevant documents to be submitted.

b Section 3 sets out the parallel nature conservation legal framework that interacts with the planning system and is of importance in this particular instance.

c Section 4 describes the existing peat ecology and hydrology of Bolton Fell Moss in the context of the history of how the bog was formed.

d Section 5 sets out the objectives for the restoration

e Section 6 sets out some of other matters considered when preparing the proposals and some of the alternatives considered.

f Section 7 describes the proposals as set out in the accompanying plans.

g Section 8 sets out the proposals for managing the aftercare of the site following completion of the physical works.

2 Planning Context.

2.1 The planning history

2.1.1 Whilst commoners rights for turbury have been exercised on Bolton Fell Moss for many years, planning permission for the commercial harvesting of peat was first given in 1957. Subsequently 4 further planning permissions were granted covering further areas of the Moss. Initially peat was harvested by hand cutting. This then progressed to machine cutting and then to the milling operations we are familiar with today.

2.1.2 In 1999, following a review of the planning conditions that the above permissions were subject to, Cumbria County Council issued a modern set of planning conditions with which the mineral operator has to comply (ROMP decision notice reference 97/9025). Condition 1 limits the period over which extraction can take place until 2040 and restoration of the site has to be completed 2042.

2.2 The current planning application

2.2.1 Natural England's scheme of restoration ("the Bolton Fell Moss Restoration Scheme" or "Scheme") requires planning permission from the local Mineral Planning Authority. This is owing to proposed engineering operations that will take place beyond the boundary of the site's existing granted planning permission.

2.2.2 It is also possible to obtain consent for restoration through submission of restoration particulars in accordance with the planning conditions imposed in 1999 on the mineral operations[1]. This approach was recently undertaken in relation to the Dalgleish field which now has permission for restoration.

2.2.3 However the area to be protected as part of the Scheme is wider than the area within which engineering operations are to take place. The boundary of the latter is referred to as the planning boundary as shown on the Site Plan (Plan 2) . The areas beyond the planning boundary will be managed to maintain their conservation value. These wider areas have been taken into account for Environmental Impact Assessment ("EIA") purposes.

2.2.4 A number of planning documents will be submitted as part of the planning application:

- The planning forms, which set out particulars in relation to the application.
- A separate Planning Statement, which has been prepared to set out Natural England's assessment of how the proposals perform in relation to the development plan and other material considerations.
- The Environmental Statement, which reports on the assessment of the Scheme as required under terms of the EIA regulations.

2.2.5 The latter document has been prepared following the issuing of Screening and Scoping Opinions by Cumbria County Council in 2011.

2.2.6 In addition a Statement of Community Involvement is submitted setting out Natural England's efforts at pre application community engagement with all local people.

2.2.7 A significant number of people, as well as WSH, are being notified of the application because of their interest in the land.

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[1]Subject to minor changes in one of the conditions.

2.2.8 Natural England has made efforts to hold discussions with every landowner before the submission of the planning application and most have been successfully contacted. The submission of the planning application gives them a further opportunity to comment and for Cumbria County Council as Mineral Planning Authority to independently assess the merits of those comments.

3 The implications of Nature Conservation Law.

3.1.1 Whilst the Scheme requires planning permission it is also subject to laws and regulations concerning the conservation of biodiversity and the management of the use of land with nature conservation designations.

3.2 Implications of the SSSI designation.

3.2.1 Parts of the application site have been designated as a Site of Special Scientific Interest ("SSSI") since 1954. The area of designation has been subject to review at various points in time but the current extent of the designated area is shown on Plan 3.

3.2.2 There are plans for a further review of the extent of the designated area to commence during 2013. Preliminary survey work has already been undertaken and an indicative boundary identified. A plan showing the extent of that indicative boundary is enclosed at Plan 4 and this also defines the limits of the Scheme, thus becoming the Scheme boundary

3.2.3 There is a parcel of land supporting a remnant area of lowland raised bog situated to the south of Bolton Fell Moss. This area, referred to as the Southern Lobe, is an important part of the mire macrotope (larger mire landscape) providing a link to the neighbouring Walton Moss SSSI and SAC. The lobe is of SSSI quality and as such will be included within the proposed SSSI boundary in 2014. However, it is not essential for the restoration of Bolton Fell Moss Special Area of Conservation (see below) and is therefore not included within the SAC boundary and its restoration does not form part of the Bolton Fell Moss Restoration Scheme.

3.2.4 Land within a SSSI is subject to a consent regime outside of the planning system dealt with under Section 28 of the Wildlife and Countryside Act 1981. In England, Natural England acts as the regulator under this act and grants permission for any works that will affect the scientific interest of the site. However it also has a duty to respond to consultations from Local Planning Authorities where development is:

a in or likely to affect a SSSI

b within an area that has been notified to the local planning authority by Natural England and which is within 2 kilometres of a SSSI.

3.2.5 A variety of consenting procedures will be used at Bolton Fell Moss:

- For works which forms part of the planning permission for restoration Natural England's Land Use Function will provide the local planning authority with formal advice under Section 28 I of the Wildlife and Countryside Act 1981 on the potential impacts of the works on the interest features of the SSSI. If work is carried out under an Environmental Stewardship agreement, or other agreed management agreement, then the agreement will act as consent under Section 28E of the Wildlife and Countryside Act 1981
- Other works by owners or occupiers of land will be subject to the normal notice and consent regime under Section 28 E of the Wildlife and Countryside Act 1981
- Statutory Undertakers who wish to undertake operations on Bolton Fell Moss in relation to their statutory duties will be required to first obtain an assent from Natural England under Section 28 H of the Wildlife and Countryside Act 1981

3.2.6 Natural England is not able to issue Section 28E consent to itself for work that it carries out on land that it owns or leases. It is anticipated that all of the works that Natural England will be carried out at Bolton Fell Moss will be subject to planning permission and that the planning consent will provide the legal basis for restoration activities. Advice on the likely impacts of this work will be issued by Natural England to the local planning authority under Section 28 I of the Wildlife and Countryside Act 1981. This will be independent advice issued by staff who will have no connection with Bolton Fell Moss. The advice issued will be based solely on the information provided in the documents submitted for planning.

3.3 Implications of the SCI designation.

3.3.1 In 1992 the European Council adopted the directive 92/4/EEC on the Conservation of natural habitats and of wild fauna and flora ("the Habitats Directive"). This required member states to take measures to maintain or restore natural habitats and species listed on the Annexes to the Directive at favourable conservation status. Degraded raised peat bogs such as at Bolton Fell were identified.

3.3.2 The Directive also introduced two designations, the Special Area of Conservation ("SAC") and the Site of Community Interest ("SCI"). Once a site is listed as a candidate Special Area of Conservation ("cSAC") by a national government it can then be adopted by the European Council as a SCI and then the member state has to adopt it as a SAC within 6 years. All these designations (along with others) are commonly referred to as European sites.

3.3.3 Bolton Fell Moss became a cSAC and subsequently a SCI in 2009. The designated area is identified on Plan 5. The reason for its designation is because it is a rare and diminishing habitat as explained in the next section.

3.3.4 It is the designation of Bolton Fell Moss as a cSAC and SCI that has required positive action from the UK Government and its agent Natural England to restore the degraded peat bog. In discussions with Cumbria County Council it was agreed that the Scheme involved development which required planning permission and hence the requirement to take positive action has also resulted in Natural England making this planning application.

3.3.5 However the national regulations that translate the Habitats Directive into UK Law, the Conservation of Habitats and Species Regulations 2010, contain specific provisions for the assessment of any plan or project involving a European site, which expressly require consultation of Natural England as the appropriate nature conservation body.

3.3.6 There is nevertheless an exception to this requirement, as explained in Section 4 of the accompanying Planning Statement, and it is Natural England's position that this exception will apply in relation to the current planning application and there is no need for Cumbria County Council to undertake appropriate assessment.

4 Baseline Ecology and Hydrology

4.1 Peatland Ecology

4.1.1 Peatland habitats can be found all over the world but the highest cover is largely in the northern hemisphere, including the UK.

4.1.2 Bolton Fell Moss is a type of peatland called a lowland raised bog. These are a particularly rare and threatened habitat with 94% lost in the past 100 years reducing the UK cover to just 6000ha. Much of this total is damaged or in poor condition.

4.1.3 Lowland raised bogs began to form in Great Britain at the end of the last ice-age. When the glaciers retreated, they left behind a series of lakes (Figure 1, stage 1). Some of these were gradually covered with reeds forming swamps (stage 2). Fragments of dead reeds and other plants were preserved in these waterlogged swamps, leading to a gradual accumulation of peat. As the plants around the edges of the swamp used up all of the nutrients flowing in from the surrounding ground, the centre became waterlogged with few nutrients, leading to the formation of a bog (stage 4).

4.1.4 Some species of *Sphagnum*, a special absorbent type of moss, began to dominate the vegetation and, slowly, over thousands of years, peat began to accumulate. With time the accumulation of living Sphagnum and the slow build up of peat below produced a raised dome, sitting above the adjacent land (stage 5). The raised bogs trap the rainwater that falls on the bog and only release the water very slowly.

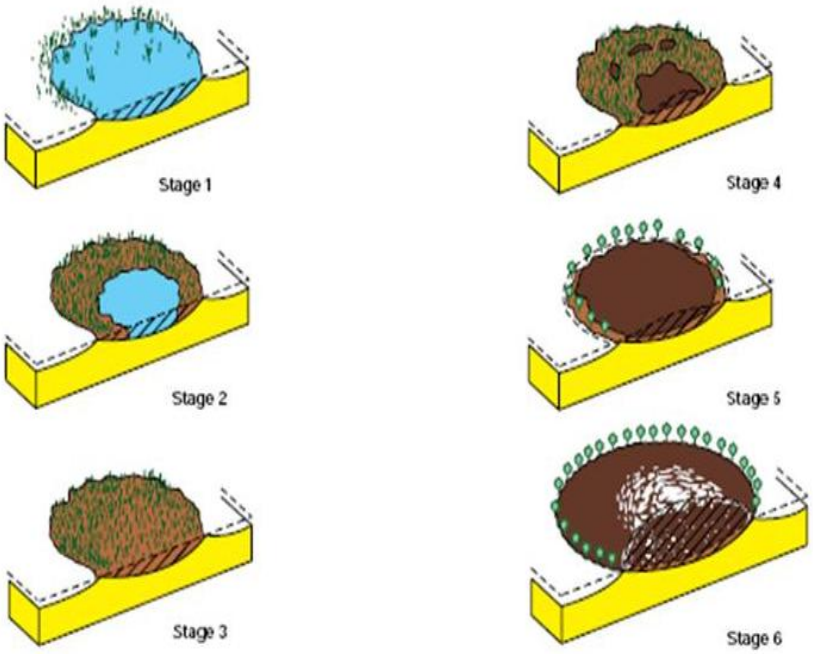

Figure 1 Formation of lowland raised bog

4.1.5 According to the JNCC[2], a number of plant communities defined by the National Vegetation Classification can be found on lowland raised bogs. Plant communities that are typical include:

[2] The Joint Nature Conservation Committee is the public body that advises the UK Government and devolved administrations on UK-wide and international nature conservation.

Mire Expanse:

- M1 to M3 bog pool communities
- M18 Erica tetralix – Sphagnum papillosum raised and blanket mire.

In addition a number of communities on the rand and lagg:M15 Scirpus cespitosus – Erica tetralix wet heath,

- M19 Calluna vulgaris – Eriophorum vaginatum blanket mire,
- M20 *Eriophorum vaginatum* blanket and raised mire
- M25 Molinia caerulea – Potentilla erecta mire and
- W4 *Betula pubescens – Molinia caerulea* woodland can be found on raised bogs which have been subject to some disturbance such as drainage or peat-cutting.

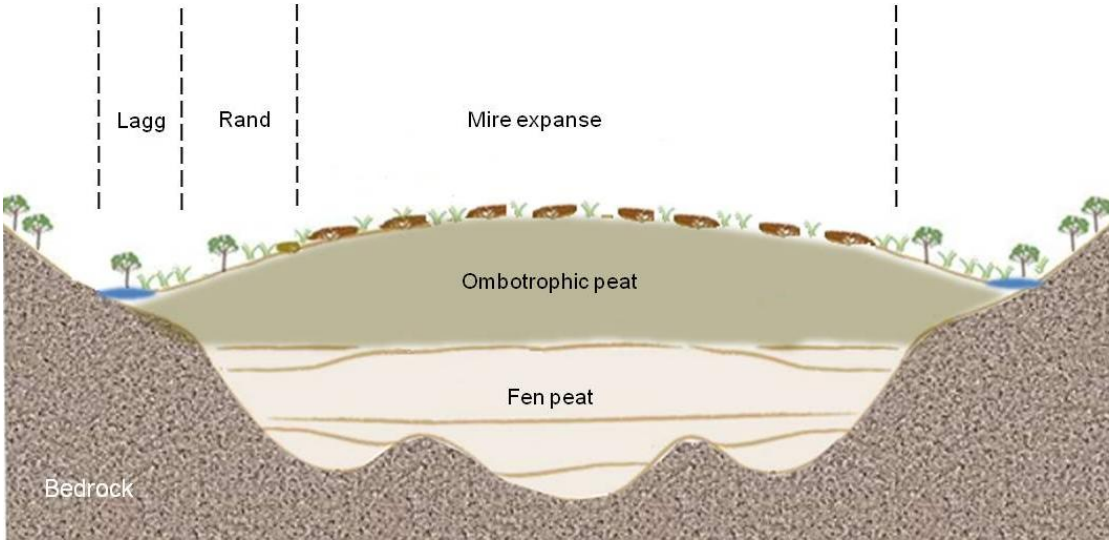

Figure 2 Cross section of a lowland raised bog showing the mire expanse, rand and lagg habitats

4.2 Impacts and Effects

4.2.1 Many of our lowland raised bogs have become damaged. This is often through afforestation, agriculture or peat cutting/milling. All of these damaging operations compromise the hydrological integrity of the bog leading to further degradation.

4.2.2 Much of Bolton fell Moss has been cut-over or milled leaving a bare peat surface.

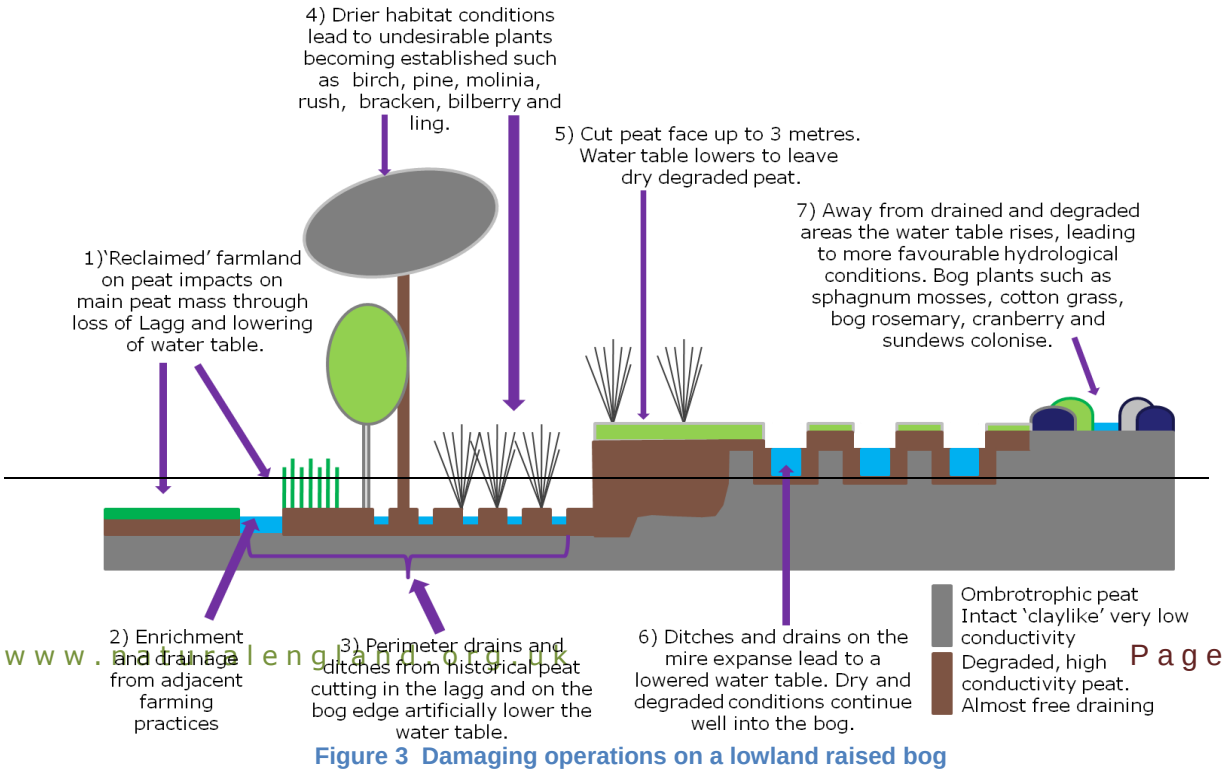

Figure 3 Damaging operations on a lowland raised bog

There are two areas where the original bog surface remains relatively intact. The area known as the reserve has good M18 vegetation as does the area known as Armstrongs (see Plan 1). However, both these areas are surrounded by old domestic cuttings, deep drains associated with extraction railway lines and milling fields. These impact the hydrology, drying out the edges, allowing scrub and dense heather to become established. The different pattern of vegetation across the Moss is shown in Plan 6, Existing Ecology

4.3 The historic hydrology

4.3.1 The landscape in the vicinity of Bolton Fell Moss was initially formed by the retreating glaciers at the end of the last Ice Age and the subsequent formation of natural drainage through a system of rivers and streams.

4.3.2 Hether Burn to the south of Bolton Fell and Leaps Flosh to the east are the main components of that system, but there is also a smaller watercourse to the south west of Bolton Fell running into Leaps Flosh.

4.3.3 It is probable that from the date of enclosure of the surrounding farmlands, circa the 18th century onwards, local farmers would have started draining their land to improve agricultural production. The main element of this would have been the construction of open ditches on the edges of fields. In more recent years field drains within the fields would also have been installed.

4.3.4 In 1959, a planning application for peat extraction in the north west part of the Moss was submitted, accompanied by an Ordnance Survey Plan dated 1952 but prepared on the basis of a survey originally undertaken in 1863. This shows a pattern of drains already established around the Dalgleish, Old Mill and Slacks fields.

4.3.5 Hydrological manipulation will require the re-distribution of some peat resources within the site to block drains and create bunds. However, this requirement must be balanced with the preservation as far as is practicably possible to preserve the paleoarcheological record that is held within the peat

4.4 Drainage systems to facilitate peat extraction

4.4.1 It is probable that the first phases of peat extraction used existing drains. However as four subsequent planning permissions were granted, the drainage system was expanded to form a network of open drainage ditches and underground drainage pipes.

4.4.2 Two main artificial drains that now serve the majority of the worked area are located on the west and northern sides of the Russell Field and drain into the Leaps Flosh to the east of the worked area. These connect backwards to the majority of the drains across the Moss.

4.4.3 Another set of drains which discharge into the Hether Burn take water from the south west corner of the Moss via ditches running around the edges of the West fields.

4.4.4 Smaller surface and covered drains provide an integrated network of drainage which enables working to take place particularly during summer months.

4.5 Drainage of the non-milled areas of the Moss

4.5.1 The areas known as the Reserve and Armstrong (see Plan 1) are impacted by deep drains associated with peat extraction described above.

4.5.2 The periphery of the bog is impacted by the drains associated with the milling, drains associated with domestic peat cutting and agricultural drainage. In addition, the lagg stream has also been heavily modified in places.

4.5.3 The existing drainage structure for the Bolton Fell Moss area is shown on Plan 7.

4.6 Settlement Ponds

Each drain that exits from Bolton Fell Moss has an associated Settlement Pond designed to allow peat particles suspended in the water coming off the moss to 'settle out' before they discharge into Leaps Flosh and other external water ways. These Settlement Ponds are maintained by WSH

5 The Restoration Objectives

5.1.1 Bolton Fell Moss will be restored in order to achieve the targets for attributes as defined in the Favourable Condition Tables and Conservation Objectives for the site.

5.1.2 Conservation Objectives are referred to in the Conservation of Habitats and Species Regulations 2010 (the “Habitats Regulations”) and the Habitats Directive 1992. They are written at SAC level and set the objectives for assessing ‘plans and projects’ against each European feature for which the site was classified for. These are set out in Appendix 1 to this document.

5.1.3 Favourable Condition Tables (FCTs) are written at the SSSI level. These set the attributes and targets for the features of interest and define the 'desired state' in measurable terms so that we can assess the effectiveness of efforts and measures to influence management and external impacts, and use feedback from monitoring to take corrective action.

5.1.4 The FCTs for Bolton Fell Moss define the parameters of the extent of desirable mire vegetation and detail what constitutes it being in good condition. These can be found in Appendix 2 to this document.

6 Other matters considered in preparing the proposals and alternatives.

6.1.1 This chapter gives a brief overview of the other matters considered in preparing the proposals as alternatives. These matters are subject to detailed assessment in the Environmental Impact Assessment.

6.2 Highways & Public Access

6.2.1 The Agreement between Natural England and WSH provides a means of access to the Moss though the adjoining factory using the existing factory road and then by a route across the factory site.

6.2.2 This will provide the main point of access for all the restoration works. The initial restoration phase will incur some vehicle movements as detailed in Appendix 3 of this document.

6.2.3 However, on completion of the restoration works, vehicle movements will be restricted to those from visitors, Natural England staff and any contractors undertaking ongoing monitoring.

6.2.4 It is not anticipated that Bolton Fell Moss will attract any great number of visitors. However the Scheme has had to take into account some requirement for limited off road parking and pedestrian access onto and around the site.

6.2.5 In respect of off road parking the land available to Natural England is limited by its Agreement with WSH and if this is to be provided it would probably be accommodated just to the south of the factory site as there currently is no other alternative location.

6.2.6 In respect of pedestrian access it is probable that Bolton Fell Moss will in due course become designated as open access land. However the underfoot conditions will not make it suitable for general roaming and therefore the most likely pathways will be around the edge of the current milled area and across the baulks separating the existing fields.

6.2.7 There is be potential to create a pedestrian access from the south linking in to the adjoining green lane. There is no land within the Scheme that adjoins an existing highway or public footpath to the west or east and such connections may, if desired by local residents, require further negotiations with adjoining landowners.

6.2.8 A full Transport Assessment has been undertaken in the Environmental Impact Assessment ("EIA") of the Scheme.

6.3 Landscape & Visual Impact

6.3.1 The restoration works will change the landform on the site, through the construction of hundreds of cells and the blocking up of drains and removal of baulks.

6.3.2 The area of peat extraction at Bolton Fell Moss is generally hidden from public view through a combination of land form, intervening vegetation and distance. However the felling of all the trees surrounding the worked area could significantly alter both the landscape and its visual impact.

6.3.3 These impacts have been assessed in the EIA and taken into account in determining the final extent of tree felling.

6.4 Ecology and Nature Conservation

6.4.1 Ecological and Hydrological surveys of Bolton Fell Moss have pointed to its degraded status and the restoration Scheme is intended to address this through meeting the objectives set out in Section 5 above

6.4.2 Other surveys have been undertaken of the fauna and flora and a full report on the findings of those surveys in set out in the EIA.

6.4.3 In preparing its proposals Natural England has taken account of what has been found and is proposing to retain important existing habitats for bats, birds and reptiles that currently occupy the site.

6.5 Archaeology & Heritage

6.5.1 The Scheme is not intended to significantly disturb any of the peat body within which archaeological remains could be found. However those undertaking the works will be expected to keep watch in case anything of paleoenvironmental interest is revealed and this will then be recorded. This issue is addressed more fully within the EIA.

6.5.2 There are no heritage features on or close to the site that merit protection.

6.6 Hydrology, Hydrogeology, Flood Risk and Pollution

6.6.1 The restoration will involve re-grading the surface of the peat bog and the construction of numerous small cells in which to hold shallow (less than 20cm) bodies of water. It will also require some blocking of internal drains. The principle of restoration is to enable water to be held within the peat body for longer thus creating the correct conditions for sphagnum growth and subsequent active peat formation.

6.6.2 It is vital to understand that peat bog restoration is an iterative process requiring constant monitoring and responding accordingly. It is impossible to detail the exact final restoration but the following principles will apply:

a Water levels will be maintained between 10cm below and 20cm above the final surface.

b A detailed hydrological study has been undertaken to establish the current baseline. This will be followed up with constant monitoring during and beyond the restoration.

6.6.3 On completion of restoration, it is anticipated that Bolton Fell Moss will contribute to alleviating flooding by reducing the peak and velocity of peak flows of water. It is also anticipated that the methodology proposed will have limited impact beyond the proposed new SSSI boundary.

6.6.4 The EIA sets out in more detail the full assessment of hydrological impacts and the consequential flood risks arising.

6.6.5 The existing Settlement Ponds, which prevent suspended peat particles from polluting external water courses, will be retained for the life of the Restoration Scheme and for at least 10 years after. The Settlement Ponds will be managed on an annual basis from when NE takes legal possession of the land.

6.6.6 During the five years of the Restoration Scheme additional oil/fuel traps will be placed at the exits to the Settlement Ponds in order to trap any accidental discharges from machinery undertaking restoration works.

6.7 Noise

6.7.1 The restoration phase will require the use of machinery, such as excavators and milling machinery, generating much the equivalent noise generated by current operations. There will also be the use of chainsaws during this time. Once restoration is complete, there is minimal anticipated machinery use on the site.

6.7.2 The potential effect of noise generated by the restoration on local noise sensitive properties has been investigated through the EIA and this is further explained in the Environmental Statement.

6.8 Alternatives

6.8.1 There are a number of alternatives that have had to be considered when formulating the Scheme. These principles have been raised in the consultations that have taken place. These include

a The extent of the Scheme and in particular whether it should extend into the Southern Lobe or not.

b The restoration methodology. There are a number of alternative approaches with different levels of intervention. A high level of intervention has been chosen because of the status of the site as a European site and the duty to restore the approach that has been taken is fairly interventionist.

c The extent of tree felling to be undertaken. At one extreme the felling of all trees could be justified on nature conservation grounds whilst on the other the Scheme could be restricted leaving all the trees intact. We have sought to achieve a balance here removing tree cover on areas of deeper peat but leaving the tree cover intact in other areas and thus also preserving particular habitats for some local fauna.

d The location and extent of access arrangements. Here the proposals are fairly flexible and intended to be responsive to emerging requirements. There will be limited public access, if at all, to the site for the duration of restoration. Thereafter it is probable that internal circular routes will be developed in response to demand. It is probable that a small car park will be established on the northern edge of the Moss but much will depend upon how the adjoining factory site is restored, which is beyond the control of Natural England. Whilst it is probable that a southern footway will be created into the Moss arrangements for access from the west and east will depend upon cooperation with adjoining landowners.

7 Restoration Works and Management

7.1 Introduction

7.1.1 For restoration to be successful, the water table needs to be at or just below the surface of the peat. Factors such as existing peat depths, surface and sub-peat topography, past management and the location of old woodlands can all impact the effectiveness and approach to restoration.

7.1.2 Information on underlying sub-surface topography and peat depths is largely complete. However, information regarding surface topography will only be possible to establish once peat extraction has ceased.

7.1.3 Owing to these factors, it will not be possible to specify at this point in which order the individual milling fields will be restored. The works are anticipated commence in autumn 2013 and may take up to 5 years depending on negotiation with WSH and land owners and managers. The following is an indicative order of when works will take place in each area, as identified on Plan 1:

i Armstrong – Edges partly restored

ii Dalgleish

iii Old Mill

iv New Mill

v Russell

vi North

vii South

viii West 1

ix West 2

x West 3

xi Slack

xii Reserve (linked to restoration of New Mill and West1/West 2)

xiii All other land within the proposed SSSI boundary

7.1.4 There are a number of different types of existing ground conditions found at the Moss. A specification for the restoration of each type and a specification for restoration has been prepared for each type as set out in the subsequent subsections. The areas of the different types are identified on Plan 8 and the different types are as follows:

i Mineral Surfaces

ii Peat Surfaces

iii Intact M18 vegetation

iv Cut peat faces

v Degraded peat surfaces

vi Degraded milled surfaces

vii Drains (See Plan 7)

viii Machinery and railway track baulks

7.1.5 Although it is in theory, possible to restore M18 and lagg vegetation to all areas with underlying peat, this is not possible beneath tree cover. There will therefore be some felling as part of this restoration to expose the peat surface The extent of felling is identified on Plan 9).

7.1.6 However, there is a case for retaining some tree cover around the bog for reasons of amenity, landscape and the provision of species habitat.

7.1.7 Natural England will, where practicably possible, retain a band of trees around the perimeter of up to 40m. This will be supplemented by additional planting where appropriate as shown on Plan 9.

7.1.8 A Masterplan, which seeks to present the main proposals, is enclosed at Plan 10.

7.1.9 In the Lagg area restoration proposals have evolved following discussion with landowners and the details are too small to be shown on the Masterplan. Therefore a series of Inset Plans has been prepared dealing in more detail with particular parcels of land. Plan 11 is the key plan identifying the location of these inset plans and Plans 11a to 11d are the individual inset plans. In the Part 2 document there is a short specification which accompanies each of these plans.

7.2 Restoration of habitat on mineral soil surfaces

Non wooded

7.2.1 There is about 10ha of mineral land At this point there is no lagg stream at the junction between mineral and peat ground therefore the bog drains directly onto it. It is likely that wetting up the bog will have a hydrological impact on the mineral area, making it wetter.

7.2.2 It is therefore sensible to have this area within the proposed Scheme boundary and manage it in accordance with conservation objectives for the rest of Bolton Fell Moss.

Management

7.2.3 There are a two management options available on this land which will depend on negotiations with landowners:

a Plant with local native tree/ shrub species.

b Manage as permanent pasture and grazed by the landowner/tenant.

7.2.4 Regardless of the option, the land must be managed with no additional drainage. Maintenance to existing drains may occur where they are not deemed damaging to the restoration of Bolton Fell Moss.

Wooded

7.2.5 There is about 5ha of woodland on mineral soil within the proposed SSSI boundary including areas of nature beech.

Management

7.2.6 No restoration works are proposed on any areas of woodland on mineral soils with the exception of any access that may be required during restoration.

7.3 Restoration of non milled peat surfaces

Intact M18 vegetation

Non wooded

7.3.1 These are the remaining remnant of the habitat that would have once covered the majority of Bolton Fell Moss. The hydrology is appropriate for the formation of peat forming *Sphagnum* mosses and there has been little or no colonisation by Silver Birch and Scot Pine which is the usual sign that this habitat is drying out.

Management

7.3.2 No works are proposed on any areas of intact M18 vegetation. Scattered trees and scrub will be retained where it is not deemed that they are damaging to the restoration of the bog.

Wooded

7.3.3 All of the remaining areas of intact peat are surrounded by steep high cut peat faces of 2-3m. The cumulative drying effect of the drainage and removal of adjacent peat through domestic and industrial extraction has resulted in the establishment of trees and scrub up to 30m onto the active bog surface.

7.3.4 Additionally the effect of gravity and the weight of growing trees cause the edge of the on cut peat mass to slump forward leaving a series of parallel cracks (to the cut peat face) which increase the drying effect as each crack acts as a drain. It is proposed that trees will be removed where they are growing on deep peat that is restorable to active bog.

Management

7.3.5 All of the trees will be removed using low ground pressure machinery. The timber and arisings will either be removed from site and sold or chipped and used to block small drains in the vicinity.

7.3.6 Re- wetting will involve the construction of bunded cells of around 20m x 7.5m with the long axis at right angles to the gradient. (Appendices 4 & 5)

7.3.7 The surface normally returns to a cotton grass/*Sphagnum* dominated habitat within three years. It is unlikely that *Sphagnum* will have to be re-introduced in these areas.

7.4 Restoration of cut peat faces

7.4.1 All of the Intact M18 vegetation lobes, both wooded and non wooded are surrounded by steep cut peat faces, up to 3m in height, and/or deep drains 2/3m deep by 2/3m wide associated with the WSH milling operation.

7.4.2 The cut faces do not readily vegetate, leaving bare peat which rapidly dries out. This drying effect can influence up to 30m of the adjacent intact M18 bog leading to a change from M18 vegetation to one dominated by heather, trees and scrub.

7.4.3 Work is required on these steep surfaces in order to hold water against the M18 vegetation. This reduces the drying out effect and provides an appropriate surface for re-vegetation to take place.

Management

7.4.4 All of the trees will be removed using low ground pressure machinery. The timber and arisings will either be removed from site and sold or chipped and used to block small drains in the vicinity.

7.4.5 The cut peat face will be re-profiled and bunds constructed at the top and the base (Appendix 6). These bunds will be linked into bunded cells on the intact M18 vegetated peat surface and into the degraded peat surfaces below (Appendix 4 & 5)

7.5 Restoration of degraded, vegetated - non milled peat surfaces

7.5.1 These are areas where peat cutting has taken place and the land has then been:

a abandoned and for some reason has not been colonised by trees usually because of regular burning or grazing.

b abandoned and has become colonised by trees. Cut over peat bog – no further modification

c converted to agriculture

7.5.2 The success and speed of restoration of these areas depends on two factors.

a Is the area to be managed to form an active peat forming Sphagnum surface or lagg fen vegetation?

b Is the area to be retained to form a screen of trees around Bolton fell Moss for landscape, species and amenity reasons?

7.5.3 Re- wetting will involve the construction of bunded cells (Appendix 4 & 5) of around 20m by 10m with the long axis at right angles to the gradient. This technique will be used on areas where we are proposing to restore to active peat forming vegetation or lagg.

Management

Where the degraded surface is to be returned to active peat forming bog or lagg fen then:

7.5.4 Trees, if present, will be removed using low ground pressure machinery. The arisings will either be removed from site and sold or chipped and used to block small drains in the vicinity.

7.5.5 Re- wetting will involve the construction of bunded cells (Appendix 4 & 5) of around 20m by 10m with the long axis at right angles to the gradient.

Vegetation management

7.5.6 There are three possible management scenarios. The vegetation response will be different for each:

a Cut over bog

No further modification will be required. The vegetation will return rapidly to a cotton grass/*Sphagnum* dominated habitat. However, owing to the lack of *Sphagnum* in the vicinity, natural regeneration of this species may be slow, so inoculation with *Sphagnum* may be necessary. This will be considered on a site by site basis (Appendix 7).

b Cut over bog converted to agriculture

The response on these surfaces to re wetting will differ owing to the nutrients that have been applied. A soft rush/purple moor grass habitat is likely to develop. However, experience from other sites has shown that the soft rush acts as a matrix/nurse crop for species such as *Sphagnum cuspidatum.* This can eventually dominate and restrict the soft rush although it can take up to 20 years.

The introduction of *Sphagnum* in these areas will have to be considered on a site by site basis (Appendix 7).

c Cut over bog converted to agriculture but retained for grazing

No management proposed.

Where the degraded peat surface is to be retained as woodland on peat:

7.5.7 All drains within these woodlands will be blocked at 7.5m intervals in order to raise the water table to prevent the peat drying out further and impacting on the areas that will have been restored to active peat forming *Sphagnum* bog. Some of the existing trees will slowly die but will be replaced by other species such as willow where the peat is thin.

7.6 Restoration of degraded – milled peat surfaces, included field drains (WSH's)

7.6.1 These are bare areas of peat are on the whole devoid of vegetation although some Scots Pine and silver Birch have colonised in Dalgleish. The surface may be ombrotrophic peat if milling has ceased recently. If not, it will have a thin crust of degraded peat.

7.6.2 The milling fields contain numerous drains measuring approximately 1.5m wide by 1m deep.

7.6.3 All of the milling fields slope from west to east and the field drains discharge into main internal drains. This then drains off the site through the perimeter drain and/or the modified lagg stream

Management

7.6.4 All of the trees will be removed using low ground pressure machinery. The timber and arisings will be chipped and used to block small drains in the vicinity.

7.6.5 The bare peat surface needs to be to be prepared for donor vegetation by terracing and/or scarifying (Appendix 7).

7.6.6 The field drains will be blocked as part of the terracing process (Appendices 4 & 7) and bunds/cells constructed to hold water (Appendix 5).

7.6.7 Donor vegetation, protective insulant layers and fertiliser will then need to be added in order to get active M18 vegetation growing again (Appendix 7).

7.7 Drains

Field Drains

7.7.1 These are regular drains at 11m spacing's that drain the milling fields. They link into the sites main internal drainage system which then discharges water from the site into the perimeter drain/modified lagg stream.

Management

7.7.2 Field drains will be blocked at the same time as the terracing of the milling fields.

Main Internal drains

7.7.3 These are large drains between 3-4m deep and 2-3m in wide. They carry excess water off the site by linking into the perimeter drain/modified lagg stream. They also link the milling fields via pipes and culverts under the railway and haul roads.

Management

7.7.4 These drains need to remain fully functional while restoration takes place. Owing to the topography and gradient of the site, if these were to block then excess water would back up drowning out areas where restoration work has taken place. This would be detrimental to the restoration process.

Perimeter drains/modified lagg stream.

7.7.5 The perimeter drain/modified lagg stream around Bolton Fell Moss occurs both in and out of the proposed SSSI boundary. Ownership will be divided between Natural England and private Landowners.

7.7.6 Maintenance of flow in the lagg stream is important as it carries excess water off the site. Blocking or rising of the water level in this drain could have impacts on adjacent land and could also have a negative impact on the bog by allowing nutrient enriched water from farmland/septic tanks to spread out onto the degraded peat surface. This would encourage the growth of non target species/habitat.

7.7.7 There are a number of locations where the perimeter drain/modified lagg stream has become blocked, ineffective or piped. In these locations the drain will need be managed to ensure that excess water from both Bolton Fell Moss and adjacent land can freely through.

7.7.8 The drains enter Settlement Ponds designed to allow suspended peat particles to settle out before discharging into external water courses and prevent sedimentation of them

Management

7.7.9 Management will be determined on a site by site basis but will include:

- Diversion to move the lagg stream off peat surfaces to the edge of the peat boundary.
- Opening up of the drain where piped in order to allow the development of appropriate habitat.
- Targeted drain clearance and modification to ensure that the water can flow freely.
- Settlement Ponds will be managed on an annual basis from when NE take legal passion of the land till at least 10 years from the finish of the Restoration Scheme. Additional oil/fuel traps will be installed while machinery is working on site to prevent any accidental discharges entering surrounding water courses and polluting them.

7.7.10 Management of the perimeter drain/modified lagg stream will be divided between Natural England and the Landowner depending on ownership.

7.7.11 Adjacent landowners will be required to have a permit from the Environment Agency for works within and outside of the SSSI boundary. Any such permits will also have to be approved by Natural England.

7.8 Machinery and railway track baulks.

7.8.1 Machinery and railway track baulks are to be retained to be used both for future management/maintenance and for public access.

7.8.2 The baulks are a significant size of up to 10-20m wide by 2-3m above the adjacent ground level. They split the milling fields from each other and have deep drains on either side.

7.8.3 The main internal drains that carry water from the milling fields into the perimeter drain/modified lagg pass beneath the bulks in pipes. These pipes must be maintained to avoid blockage which would cause water to back-up and drown out restoration works.

Management

a Replace all pipes with 600mm diameter twin walled corrugated plastic drainage pipe.

b Grade bulk side to a minimum of 30 degree angle.

c Block drains where they are not required to convey excess water off the site

d Cover re profiled sides with heather brash.

8 After-use, maintenance and public access

8.1.1 The principle purpose of the restoration is to establish active peat forming vegetation on the degraded peat areas. However when this is achieved it will produce a rich ecology.

8.1.2 To ensure that the area is protected, the current boundary of Bolton Fell Moss Site of Special Scientific Interest will be extended to include the whole of the lowland raised bog and its peripheral habitats. Notification of the new boundary will commence in 2014upon completion of milling on the site. No further decisions have been taken regarding the future designation of Bolton Fell Moss but it is possible that it may become a National Nature Reserve.

8.1.3 It is proposed that Natural England will be directly responsible for the maintenance of the majority of the land. However, it may be more appropriate for some peripheral land to be managed sympathetically through the implementation of management agreements such as the Higher Level Scheme of Environmental Stewardship or successor schemes.

8.1.4 There are no public rights of way into and across the Moss. Natural England is exploring the provision of public access as part of the design of the Scheme and the Masterplan (Plan 10) identifies the potential location for a car park, the potential route for a footpath into the site from the south and potential routes around and through the site. At present there are no proposals for any east of west pedestrian access to the Moss and these will require the co-operation of adjoining landowners. However the creation of such accesses should not require further planning approval as there are unlikely to be any associated works that are not permitted development.