global environmental solutions

Washington Sand Pit, West Sussex

Landscape Restoration Management Plan - Associated Commentary

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CONTENTS

TABLES

DRAWINGS

1.0 INTRODUCTION

1.1 Introduction

SLR Consulting Ltd (SLR) has been commissioned by BritaniaCrest Recycling Ltd to prepare a Landscape Restoration Management Plan to accompany the proposed restoration scheme at Washington Pit Quarry, West Sussex.

The site is in or near to two National Character Areas (NCAs), as defined by Natural England, namely the South Downs and Wealden Greensand NCAs, with the A283 forming the approximate boundary between them. The site itself lies within the Wealden Greensand NCA to the north of the A283 but its character is influenced by the South Downs NCA directly to the south.

The South Downs form a prominent escarpment to the south rising to over 200m AOD in elevation, running east to west, and with the crest of the ridge approximately 1.5km to the south of the site within the South Downs NCA. The scarp slopes provide a backdrop to the landscape of the Wealden Greensand. To the north within the Wealden Greensand the ground is generally undulating with shallow valleys and low hills such as Washington Common to the northeast of the site.

At a local level the site falls within the 'Storrington Woods and Heaths' Landscape Character Area WG7 (West Sussex County Council Landscape Character Assessment 2003), but is adjacent to the 'Central Scarp Footslopes' LCA WG8 along the development sites southern boundary. The former area is characterised by low wooded ridges of oak-birch woodland as well as smaller broadleaved woodland blocks, patches of heathland amongst small to medium sized pastures and arable fields, narrow winding lanes, sand quarries and an extensive network of rights of way. However, there is a notable decline in woodland and hedgerow management in the area and increased pressures for development around the key settlements such as Storrington, as well as localised intrusion caused by the sand quarrying operations. As such the landscape guidelines for the area state that the mosaic of woodland and heathland habitats be conserved and that any new development be well integrated into the landscape. The following restoration scheme takes these guidelines into account.

All designs and recommendations included in the following report and accompanying drawing are for planning purposes only and not intended to be used as the basis for construction earthworks and other operations on-site. All detailed risk assessments and other aspects of operational health and safety will be carried out by BritaniaCrest Recycling Ltd prior to the preparation of contractual documents.

2.0 LANDSCAPE RESTORATION SCHEME

2.1 Introduction – Long Term Aims & Objectives

The proposed Landscape Restoration Scheme for the application site is shown on Drawing No. WP L/15

The main aims and objectives of the scheme are to conserve and enhance the character and ecology of the local area in line with the West Sussex County Council Landscape Management Guidelines (2003), as well as maintaining and enhancing the overall integrity of the Sandgate park area and proposals for a country park in line with Horsham District Council LDF Policy AL19, as follows (paragraph 3.65):

"There is scope to create a variety of formal and informal recreation uses following sand extraction at Sandgate Park between Water Lane and Hampers Lane. The grading and landscaping process with respect to lagoons in the east of the site has already begun. These areas could be used for informal recreational purposes as well as fishing and water sports such as windsurfing. There is a need for small campsites for "backpackers" within easy reach of the South Downs Way and also a hostel or "bunkhouse" accommodation, providing simple dormitory and self-catering facilities. It is considered that Sandgate Park could provide such facilities given its proximity to the South Downs Way, just half a mile away. Sandgate Park could also be a suitable location for additional active sports provisions such as football pitches."

2.2 Landscape Features and Planting Areas

The Landscape Restoration Scheme consists of a number of key parts, as detailed below. Please also refer to Drawing WP L/15.

2.2.1 Existing Planting to be retained

The Washington Pit site is currently set within a mature framework of broadleaved woodland planting including species of oak and birch. All existing woodland within and adjoining the site will be protected and actively managed throughout the duration of all works and beyond. Any infill planting will be carefully considered.

2.2.2 Existing Landscape Features

Sandstone Faces

The southern edge of the Washington Pit site includes a number of exposed sandstone faces, some recently created, which are not only attractive features in their own right, but provide a record of past activities on the site. As such the sandstone face at the south western most edge of the site will be retained and managed accordingly to prevent excessive scrub encroachment. Although quite visible at present weathering of this face will quickly reduce its visual prominence to that of other existing faces such as illustrated in Figure 1 over the page. The surrounding area will be backfilled to allow integration of the face with the wider site. In the interests of public safety, no public access will be permitted to this area of the site.

Figure 1 Photograph of existing sandstone face on site

Waterbodies

The existing waterbodies on the Cemex site remain untouched by this application. However, the proposed landscape restoration scheme seeks to adapt the existing waterbody which overlaps into the Washington Pit site to provide something which respects the character of those waterbodies to be retained whilst being more conducive with public access, i.e. eastern edge of waterbody profiled for safer waterside activities, as well as ecological interplay. As Britaniacrest has no control on the CEMEX restoration operations it is proposed to keep the proposed site water body separate from the CEMEX lakes initially by re-enforcing the broken bank of willow scrub which forms the current boundary between the two sites. The ground water and substrate used will allow movement of water between the two water bodies but prevent movement of silt. This approach will protect the restoration of Washington Pit until the CEMEX site restoration is also completed. At that stage the gravel bank will be breached to join the two water bodies and create a series of islands. Consideration will need to be given to prevent public access along this bank before and after this operation to ensure the safety of the public is preserved as far as possible.

2.2.3 Proposed Planting and Features

Woodland and Woodland Edge

The site and surrounding area is characterised by mixed deciduous, oak-birch woodland approximating to NVC Mix W10 but with some less characteristic coniferous species in places. As such the proposed woodland planting (approximately 14,500m^2) will seek to respect the character of existing woodlands in the local area, including such species as oak, birch, hornbeam, hazel and holly within a framework of woodland and woodland edge planting.

Proposed Meadow

The area of restored land immediately adjacent to the reprofiled waterbody to the east will be seeded with a meadow mix approximating to NVC Mix MG9 Grassland, such as British Seed Houses Mix RE2 Lowland Meadow which is suited to areas of open woodland and lake and river edges, as well as areas of previously developed land. The proposed meadow (approximately 14,648m^2) will encourage insects and birds to the site and creates an

attractive swathe of late spring, summer interest throughout the site which will be attractive to local visitors across the site.

Proposed Acid Grassland

Those areas of the site not left to naturally regenerate or seeded with meadow grassland, will be seeded with an acid (calcifugous) grassland mix (approximately 19,850m^2); *Agrostis-Festuca* grassland, dominated by species of bent grass *Agrostis spp*., sheep's fescue *Festuca ovina* and Red Fescue *Festuca rubra* such as British Seed Houses Mix A16. Those areas to the south of the site where the slopes are greater than 1:3 would usually be considered for hydroseeding. In the case of Washington Pit the limited areas concerned, benefits of bare ground for ecology value, and natural re-vegetation of near vertical sand slopes suggests such operations are not required at this site. Therefore a monitoring position would be implemented to ensure such slopes are checked for erosion and seeding undertaken if issues arise within the course of the 5 year aftercare period

Proposed Scrub/Natural Regeneration

The edges of the site are to be left to naturally colonise with scrub species, however as above this is to be carefully monitored to ensure the stability of side slopes as well as appropriateness of species.

Proposed Waterbody

As discussed above, the proposed waterbody at the western edge of the site allows for a reprofiling of the land to create a small waterbody which abuts the larger waterbodies on the Cemex site to the west, separated by a bank on which natural colonisation of species is to be monitored. The purpose of the waterbody is largely for ecology owing to its size, with shallow shelves supporting wading birds but also conducive to the safety of the general public who may be walking along the adjacent footpath. It is assumed that the larger waterbodies within the Cemex site would be more appropriate for watersports and fishing in accordance with Policy AL19 of Horsham District Council LDF.

Proposed Swales

In order to allow for the effective management of surface water runoff across the restored site, indicative swale locations have been identified on the landscape restoration plan which would also become valuable movement corridors and habitats for local flora and fauna. The exact details of the swales will be designed at a later date. Should further surface water runoff measures be required then there is also room in the north eastern corner of the site for an additional pond.

Proposed Campsite/informal recreation area

In line with Horsham District Council LDF Policy AL19 a level platform has been retained at the north eastern corner of the site to accommodate informal recreational use with the potential for camping, and with the development of basic facilities such as toilet and washing up blocks as part of any later Country Park development funded by the council. This location supports elevated views down across the site whilst being nestled into the surrounding woodland and utilising the existing site access to be retained.

Proposed Picnic Area

A public picnic area is to be created at the south eastern edge of the site, with direct access from the adjacent parking area and with links to the proposed public footpath looping around

the site. The location of the picnic area supports views down across the site, and adjacent to the parking area looks to minimise any potential litter issues and discord with the underlying nature conservation value of the site.

Proposed Parking

As discussed above, a public parking area will be accommodated within a glade in the existing woodland at the south eastern edge of the site. The parking is located here to restrict vehicular access to the site, with the exception of maintenance access. Direct access is gained off Washington Road and the existing haul road without considerable upheaval to the existing site. The parking area will be surfaced with bare consolidated gravel or other such surface as deemed appropriate for use and conservation habitat.

Proposed Footpath

Public movement around the site is encouraged to all but the south western edge of the site, fostering links with the wider area and Country Park. Footpaths will be hard surfaced with bare consolidated gravel or other appropriate surface where necessary and appropriately signposted.

3.0 IMPLEMENTATION OF LANDSCAPE RESTORATION SCHEME

The following sections of the report deal with how the Landscape Restoration Scheme will be implemented on site, including preparatory tasks, as well as the management and maintenance of existing and proposed planting and features which will further assist with enhancing the visual qualities of the site, as well as the enhancement of any biodiversity on site, and in accordance with Policy AL19 of Horsham District Council LDF and other relevant plan policies (refer to LVA document for further policy context).

3.1 Schedule of Implementation

The landscape works are to be undertaken in the first planting season to coincide with or following the completion of the construction and soiling of the relevant new landform on site. All ground preparation and woodland planting would take place between the end of October and beginning of April, whilst all seeding works would either take place in September/October or March/April. However all the aforementioned activities may be affected by changes in the working programme which may delay planting and seeding activities owing to the ecology programme, such as bird nesting season, as well as weather.

3.2 Ground Preparation

3.2.1 Clearance

Prior to commencement of all planting and seeding works on site, all areas will be suitably cleared and excavated. All planting areas will be cleared of all unwanted rubbish, and any debris and unwanted vegetation/weeds will be removed to an approved tip prior to planting. The location of any existing services within the site will also be established by the contractor before clearance works and planting begins.

All vegetation requiring removal should be cleared outside the bird nesting season (March to Late August inclusive) and checked for the presence of breeding birds prior to work commencing. Where the former is not possible, a bird nesting survey should be carried out prior to the commencement of works by a suitably qualified ecologist.

*3.2.2 Soil Resource, Handling, Storage and Stockpilin*g

The following section of this report deals with soil handling operations for areas where landscape planting works are proposed and where soil movements in the vicinity of retained and/or proposed vegetation will be required. The existing soils will need to be recovered and stored for later re-use where possible.

All soil handling operations will follow the guidelines set out in *BS:3882: Specification for topsoil and requirements for use* to make the best use of the available soil resource and minimise compaction as follows:

- All soil units will be separately stripped, stored and replaced;
- All soil units will be handled when dry and friable; and
- Where possible, no heavy wheeled earthmoving vehicles or machines will run over *in-situ*/un-disturbed or replaced soils.

Where space is limited during profiling works, the soils will be placed into temporary storage mounds, according to the following methods:

- The storage areas will be subdivided into each part to receive each soil unit (topsoil or subsoil);
- Materials will be placed on dry firm foundations, which have been stripped of soils and/or soft material, as appropriate;
- Stored in heaps of a maximum 4m height; and
- To minimise soil wetness storage heaps will be shaped to shed water and positioned in the direction of flood water flows.

Soils will be stripped and restored sequentially to avoid trafficking of insitu or newly placed soil layers, according to the following methods:

- All plant and equipment will only operate on the top of formation level and shall under no circumstances run on insitu or replaced soil layers. Soil stripping will start at the nearest point to the storage area and soil replacement will therefore start at the farthest point from the storage area or where there is direct access to a haul route without traversing soils;
- Soils will be handled by hydraulic backacter/tracked excavators with toothless buckets standing on the adjacent area and recovering and spreading to full thickness;
- Ideally the topsoil and subsoil will be handled in sequence. Each layer will be sequentially replaced to the thickness described above. The next strip will not be started until the current one is completely replaced to final levels; and
- Spread soil will only comprise of blocks of soil less than 300mm diameter in any direction. Any oversize blocks will be broken down using the excavator bucket before the next load is spread.

When stripping of topsoil is required, for example where there will be hard surfacing, e.g. for parking, this should be to an average depth of 300mm, although soils will not be removed from below the spread of trees to be retained. Where planting is required above existing underground structures, e.g. foundations etc. (exact location to be confirmed by contractor before work commences) and proposed services e.g. cables in ducting, the minimum required soil depth will be 750mm for shrub planting and 1000mm within 2m of tree planting and 500mm for grass. These profiles allow for a minimum of 300mm of topsoil.

Before spreading soil over planting areas, stones larger than 50mm as well as other debris will be removed immediately. All soil will then be graded to smooth flowing contours to achieve the specified finished levels. After settlement, the finished level of soil should be married in with adjoining soil areas.

The proposed restoration scheme recognises that high quality topsoil is not a pre-requisite for the proposed afteruses of the site. However, the substrate may require the addition of soils/soil-forming materials to improve ground conditions for the target habitats (such as soil structure and drainage/water holding capacity) and also mechanical de-compaction. In general terms, however, the low nutrient substrate would inhibit growth of competitive species and therefore have the potential to support ecologically diverse plant communities.

For example, acid grassland requires free-draining, acidic substrate which has a low nutrient status, whereas localised wet areas would encourage wet grassland or transitional wet-dry grassland. The successful establishment and final proportions of each broad habitat type would also depend on the physical characteristics of the available restoration materials.

3.2.3 Cultivation and Decompaction

The proposed methods of cultivation will be reviewed prior to the works commencing, in recognition of the need for a flexible approach, in view of changes over time in the design and availability of machinery and site conditions.

Soil analysis would be undertaken prior to any cultivation works to predetermine the rates of fertiliser (NPK) and lime that would be required and the appropriate amounts would be applied prior to seeding.

All areas of tree and shrub planting will be assessed for compaction prior to planting and if necessary or practical, de-compaction will be carried out to a depth of 500mm, with soils loosened, aerated and broken up, when ground conditions are reasonably dry.

All areas to be sown with seed will require good preparation in order to control weeds and produce a good quality seed bed before sowing. To prepare the seed bed weeds would first be removed using repeated cultivation or a herbicide. Ploughing or digging would then be undertaken to bury the surface vegetation and then the ground harrowed or raked where possible to produce a medium tilth, and then rolled to produce a firm surface. On the steeper slopes at the southern edge of the site this will not always be possible.

3.2.4 Herbicide

A suitable non-residual herbicide will be applied to areas receiving soft landscaping. Herbicides are not to be applied within 10m of any watercourse or waterbody. If deemed necessary Environment Agency consent would be required (refer to Environment Agency Guidance Notes AqHerb01: Agreement to use herbicides in or near water). If herbicides are to be used prior to planting and seeding then 2 weeks should be allowed before planting and seeding operations commence.

3.2.5 Watering

The need for watering will be assessed prior to the commencement of works. If considered necessary, the full depth of soil will be watered during planting operations and all areas thoroughly watered immediately after operations, without damaging or displacing plants. It is anticipated that new planting may be watered, particularly in drier periods in the first year, subject to contractual agreements with the client and landscape contractor. Thereafter, plants will be assessed on an annual basis, to establish the need for watering.

3.2.6 Protection of existing planting and landscape features

Areas of existing vegetation and features to be retained will be protected throughout the restoration earthworks by installing temporary demarcation pegs at 5m intervals at a minimum 5m standoff to the boundary, which would then be removed at the end of works.

4.0 PLANTING SPECIFICATION

4.1 Proposed Grassland Seeding

Below, indicative seed mixes are detailed for each of the proposed grassland types across the site. For each of the seed mixes, fresh seed should be purchased for each growing season and should be blue label certified seed varieties complying with EC regulations for purity and germination.

The seed mix would be sown onto bare ground after harrowing/raking the surface and removing weeds, and should not be sown on compacted ground. Bulking up the seed with an inert carrier such as sand can make distribution easier. The seed must be surface sown and can be applied by machine or broadcast by hand in Autumn or early spring. Rolling is not necessary.

The timings of sowings will be reviewed on site in light of any changes to the construction programme and weather conditions. The newly seeded areas should be fenced off using pegs and tapes until the grass is well established.

Adjacent to the waterbody, owing to restrictions on the use of herbicides, works would take place over the summer period when ground conditions are dry then allowing seeding works to directly follow on and be undertaken at the end of the summer. This would avoid any need to use herbicides.

4.1.1 Proposed Acid Grassland

Approximately 19,850m2 of acid grassland will be sown across the heart of the site, beyond the woodland edges. A seed mix dominated by species of bent grass *Agrostis spp*., sheep's fescue *Festuca ovina* and red fescue *Festuca rubra* such as British Seed Houses Mix A16 will be sown at a rate of 10g/m2 to give a natural, low maintenance finish.

Table 1:
Indicative Acid Grassland Seed Mix

Latin Name	Common Name	% Mix
Cynosurus cristatus	Crested dog's-tail	5
Festuca rubra	Slender-creeping Red-Fescue	30
Festuca ovina	Sheeps Fescue	15
Agrostis capillaris	Common Bent	20
Lolium perenne	Perennial Ryegrass	20
Agrostis capillaris	Browntop Bent	8
Trifolium repens	Miniature White Clover	2

	TOTAL	**100**

4.1.2 Proposed Meadow Grassland

Approximately 14,650 m2 of meadow grassland will be created sweeping up from the proposed waterbody at the west of the site, to the centre of the site. Seed of local provenance will be sourced where possible approximating to NVC MG9 grassland, such as British Seed Houses RE2 Lowland Meadow, sown at a rate of 5g/m2 and which will help to encourage insects and birds to the area.

Table 2:
Indicative Meadow Seed Mix

Latin Name	Common Name	% Mix
Agrostis stolonifera	Creeping Bent	0.1
Alopecurus pratensis	Meadow Foxtail	17
Centaurea nigra	Common knapweed	1.6
Cynosurus cristatus	Crested dog's-tail	18.4
Festuca rubra	Slender-creeping Red-Fescue	18.2
Filipendula ulmaria	Meadowsweet	0.6
Leontodon autumnale	Autumn Hawkbit	0.6
Arrenatherum elatius	Tall Oat Grass	15.6
Leucanthemum vulgare	Oxeye Daisy	2
Pheleum Bertolonii	Small leaved Timothy	5
Trisetum Flavescens	Yellow Oat Grass	5
Plantago lanceolata	Ribwort Plantain	2.8
Poa trivialis	Rough Stalked Meadow Grass	0.1
Prunella vulgaris	Selfheal	2
Ranunculus acris	Meadow Buttercup	2.5
Agrimona eupatorium	Agrimony	3

Galium verum	Lady's Bedstraw	3
Conopodium majus	Pignut	1
Deschampsia caespitosa	Tufted Hair Grass	0.6
Hypochoeris radicata	Cat's Ear	0.6
Achillea millefolium	Yarrow	0.1
Lathyris pratensis	Meadow Vetchling	0.1
Pulicaria dysenteria	Common Fleabane	0.1
	TOTAL	**100**

4.2 Woodland & Woodland Edge Planting

As discussed previously, the site and surrounding area is characterised by mixed deciduous, oak-birch woodland approximating to NVC Mix W10 but with some less characteristic coniferous species in places. As such the proposed woodland planting (approximately 14,500m2) will seek to respect the character of existing woodlands in the local area, including such species as oak, birch, hornbeam, hazel and holly within a framework of woodland and woodland edge planting.

The range of species selected for the woodland mix on site will help to reduce the chances of plant failures either from poor stock, late planting, preferential animal attack, frost sensitivity or soil chemical/physical conditions and includes a majority percentage of locally recognised dominant species. N.B. Exact species numbers will be agreed with the LPA prior to commencement on site.

New tree and shrub planting will ensure a planting density of 2m centres (2,500/ha). All species will be randomly mixed to give an even distribution of species, throughout the compartment, e.g. in species groups of between 5 and 20.

Table 3:
Indicative Woodland Mix

Latin Name	Common Name	% Mix
Quercus petraea	Sessile Oak	20
Quercus robur	Pedunculate Oak	25
Betula pendula	Silver Birch	15
Betula pubescens	Downy Birch	10
Sorbus aucuparia	Rowan	5

Corylus avellana	Hazel	15
Ilex aquifolium	Holly	10
	TOTAL	**100**

Table 4:
Indicative Woodland Edge Mix

Latin Name	Common Name	% Mix
Crataegus monogyna	Hawthorn	25
Corylus avellana	Hazel	25
Prunus spinosa	Blackthorn	15
Sambucus nigra	Elder	15
Viburnum opulus	Guelder rose	15
Ilex aquifolium	Holly	5
	TOTAL	**100**

4.3 Waterbody and Swales

The waterbody at the western edge of the site and swales will be allowed to naturally colonise with scrub and riparian vegetation but will be carefully monitored to ensure appropriate species and coverage. Likewise the meadow and acid grasslands will be allowed to develop over these areas but managed so as not to inhibit surface water flows and the ecological value of the water's edge environments. Areas of bare earth are not to be discouraged at the water's edge as they provide valuable foraging areas.

Manipulation of the shape of the water's edge to create shallow irregular (no greater than 1:6), indented margins and gentle sloping access to the water for birds and other animals is proposed using a digger with a ditching bucket. The creation of shallow water zones will encourage the establishment of ecologically varied marginal wetland vegetation areas.

4.4 Scrub/natural regeneration

Those areas around the periphery of the site, most notably on the steeper slopes, will be left to naturally colonise with scrub vegetation providing further nesting and foraging habitats. The appropriateness of the vegetation will however be monitored to ensure no particularly invasive species are present and that the stability of slopes is not compromised.

4.5 Hard surfacing - Site access and Parking

The existing site access will be retained. Additional hard surfaced areas will be created at the eastern edge of the campsite area as well as within the parking area in the south eastern

corner of the site, although these areas will comprise of a bare consolidated gravel/sand surface for conservation habitat.

4.6 Picnic and Informal Recreational Area

Both the picnic and informal recreational areas will be seeded with acid grassland as per other adjacent areas of the site, but will be appropriately managed for more frequent use (refer to grassland management section).

4.7 Sources of plant stock/habitat materials

All plants will be well-grown nursery stock as seed-raised transplants, 1+1, 1/1 (2 year old transplant, one year in seedbed, transplanted and grown for one year) or 1+2, 1/2 (one year in seedbed, transplanted and grown for 2 years) up to 60cm in height (for shrubs), depending on species and form. Plants will be sourced as locally as possible and all effort will be made to source stock of native genetic origin. Trees and shrubs will be sourced from native provenance areas as shown in the Forestry Commission publication *'Using Stock for Planting native trees and shrubs'.* All plant handling and planting operations will comply with relevant clauses of CPSE *'Handling and Establishing of Landscape Plants'* (obtainable from the Horticultural Trades Association).

The health and wellbeing of all planting stock will be ensured before commencing work, including root system condition.

All transplants will be bare-root, with the exception of *Ilex aquifolium* (Holly) which will be container grown, and supplied to site in bags containing the whole root system and pit planted as necessary to accommodate the root system using a Canadian Planting Spear.

All pits will be excavated on the same day of planting. Transplant and container stock will be planted with a pit size to be a nominal 300mm diameter by 300mm depth or as necessary to accommodate their root systems. Trees will be pit planted with a slightly raised bottom to the pits and scarified sides, with a pit size to allow 300mm in any direction from the rootball by 450mm depth. Backfill will consist of previously excavated material and 3L of sanitized and stabilised, friable compost to PAS 100 (1:3 ratio) per transplant.

When planted, the top of the root collar must be level with the surrounding soil surface and the ground around the plant will be firmed in by treading, taking care to avoid scuffing or damage. The completed planting pit will be either at ground level or slightly domed to prevent waterlogging. On no account shall any roots be left exposed or bent.

All proposed tree and shrub planting will be individually protected either by 0.6m height translucent plastic spiral guards supported by a single stout cane or, in the case of the more bushy, species, a 0.6m high shrub shelter and softwood timber stakes of no less than 80mm diameter. Where appropriate rabbit fencing will be used.

For feathered trees (maximum of 250mm in height), stakes will be driven vertically at least 300mm into the bottom of the pit on either side of the tree position before planting. 100mm diameter stakes will be cut off just below the lowest branch of the tree and expanding ties used to firmly but not rigidly secure the tree to the cross bar.

The soil around all plants will then be suitably firmed and watered.

4.8 Fencing

1.2m high post and wire fencing will be erected where access is to be restricted to protect the planting as it establishes as well as in the interest of public safety, i.e. adjacent to sandstone faces.

The post and wire fencing will be installed to the most appropriate line to suit the local topography, soil/rock depth, tracks and existing planting, to be agreed on site, and will also provide protection of existing planted areas. The post and wire fencing will be constructed to BS 1722: Part 3.

Installation of the post and wire fence will be in straight lines or smoothly flowing curves, with tops of posts following the profile of the ground. All posts will be set rigid, plumb and to specified depth to ensure adequate support. In the case of phased construction of fencing or where new fencing ties into existing fencing at any joins, this will be carried out to achieve an effective barrier.

5.0 OUTLINE AFTERCARE/MANAGEMENT SCHEME

5.1 Introduction

The key aims of the Landscape Restoration Management Plan are to:

- Protect and maintain the integrity of the surrounding landscape by assisting in assimilating the proposed scheme into its surroundings; and
- Meet a balance between increased public access of the site in accordance with the wider country park objectives (Horsham District Council LDF Policy AL19) and enhanced nature conservation value of the site.

5.2 Management Proposals

The long term management strategy is to protect and enhance the local landscape character and nature conservation value of the area through the appropriate maintenance of existing habitats as well as their enhancement, and the restoration of restored areas, to increase the diversity and quality of habitats within the area and the variety of flora and fauna which can be supported. A fine balance is to be met between nature conservation and public access, thus supporting informal and formal recreational requirements of Policy AL19 of Horsham District Council LDF.

Whilst improvement works are being undertaken on site, all planting which is to be retained will be fenced off where possible and all work within the canopy of trees is to be avoided. Where it is deemed that improvement works may negatively impact on the health of trees to be retained, a suitably qualified arboriculturalist will be consulted to access the most feasible solution to ensure the long term survival of any affected tree(s).

5.3 Monitoring and Personnel

All areas of the Restoration Scheme will be closely monitored throughout a 5 year aftercare period by a suitably competent professional so that the most appropriate management regime can be defined on an area-by-area basis. A visual inspection will be carried out on a twice yearly basis (as a minimum) to check for good strong foliage and growth and the success of habitats, so that the most suitable management regime/operations can be defined for the forthcoming year.

The planting and seeding is to be maintained as per the maintenance specification (to be detailed in tender package prior to commencement on site, and to be agreed with LPA) and monitored by the contractor at each visit.

Although this management plan deals with 5 years of aftercare, it will be reviewed and revised as deemed necessary at the end of the first 5 years, with operations required reducing as the planting gets established. At year 10 the effectiveness of the development of the planted areas will be reviewed and requirement for further management identified. It may be possible that at that stage the site can become part of the long term Country Park proposals and/or managed by another body for recreational use.

5.4 Annual Management Operations

Table 5 presents a summary of main annual management operations and timings and it is proposed that a checklist and detailed record of management operations are maintained by the site operator.

Table 5
Timings of Main Annual Management Operations

Timings	Standard Operations, to be carried out as required
WINTER	• Complete record of previous year's operations; • Selective thinning/felling operations, i.e. of woodland areas; and • Replacement planting.
October – March	• Removal/thinning of scrub and bramble growth within grassland areas and on water's edge banks.
SPRING	• Visual inspection of vegetation and habitats; • Replacement seeding; • Weed control, including ring weeding, hand pulling of seedlings and monitoring of algae and marginal vegetation in wetland areas; • Readjustments and firming of planting areas; and • Assessment of fertiliser requirements in planted areas.
March -May	• Monitor grass growth and take single hay cut to around 150mm if required.
SUMMER	• Cut grassland areas removing arisings (August).
August -October	• Aftermath grazing if deemed appropriate. Not if ground too wet.
AUTUMN	• Visual inspection of vegetation and habitats; • Weed control, including hand pulling of seedlings and monitoring of algae and marginal vegetation in ponds; • Cut grass as deemed necessary; and • Review of thinning requirements.

5.5 Vegetation Management

All vegetation will be managed, with the aims of improving wildlife habitat value, amenity and appearance.

The requirements for secondary treatments will be reviewed on an annual basis, in order to identify and remedy any localised problems including:

- Stone-picking - Assessed by visual inspection and any stones lying on the surface that are larger than 100 mm diameter (i.e. they will not pass through a wire screen mesh of 100mm spacing), together with other objects likely to obstruct future cultivation, will be removed from the site;
- Compaction - Assessed by excavating inspection pits or recording areas of standing water in winter, with possible remedy to be subsoiling or other mechanical means;
- Vegetation Failure - Assessed by visual inspection, with possible remedy to be cultivation and re-seeding/planting; and

- Pruning may take place at certain times, as required, to remove dead or dying and diseased wood to promote healthy growth and natural shape. All pruning should be carried out in accordance with good horticultural practices. All tree works are to be carried out by an approved member of the Arboricultural Association.

5.5.1 Waterbodies and Swales

Aquatic and marginal flora would be allowed to naturally colonise the waterbody and swales to maximise value for amphibians, however, all will be monitored at least twice yearly for invasive species, including algae, and managed accordingly. Any litter and leaf debris is to be removed from the wetland areas. Should the establishment of noxious weeds, including arable species such as broadleaved dock be noted then they should be managed using hand pulling or cutting methods. The Environment Agency Guidelines for use of herbicides near watercourses are to be referred to, and the most appropriate course of action determined.

Biennial management inspections would be undertaken during summer and winter to inform minor earthworks and channel modifications to maximise biodiversity value as the new swales and waterbody develop and remove any silt build up.

It is recommended that woody shrubs and trees are cleared back from the waterbody edge to minimise shading to 25%, thus all natural regeneration of scrub vegetation on the banks of the waterbody is to be monitored and thinned accordingly.

5.5.2 Grassland management

The aim of grassland management across the site is to restore and enhance areas of acid grassland and species rich meadow. The grassland will be managed predominantly by late summer cutting, although sheep grazing may be appropriate, however this will be discussed with the LPA prior to any action being taken.

All grassland areas will be managed throughout the aftercare period to promote floristic diversity and associated wildlife. However, during the first year of management there is likely to be a flush of annual weeds which can be removed by topping or mowing in the mid-summer and removed from site. For all new areas of grassland, periodic cutting of the emerging sward is envisaged for the first year to control weeds and encourage tillering. Newly established grasslands would then be checked regularly for areas of failed germination and any remedial measures necessary undertaken prior to re-seeding, although some areas of bare earth are to be encouraged. In the event of excessive rabbit grazing of the sward, the erection of suitable exclusion fences would be undertaken during establishment.

In the second and subsequent years of growth the acid grassland can be managed by a summer cut across the majority of the site, although more frequent cuts will be undertaken in the camping and picnic areas as deemed appropriate. Spring and Late Autumn grazing may also be a possibility. The summer cut will be to a sward height of 5-10cm, undertaken in late July to August, with all arisings removed. Scrub and bramble growth within grassland would be removed between November and February to minimise encroachment where deemed appropriate.

Whilst short areas of grass are of benefit to wildlife, the extent of understorey growth will be monitored so as to develop natural ecotones at the woodland edges in the longer term so as to encourage invertebrate populations as food for bats and birds. Damage to tree and shrub

stems by mowers and other power tools will be avoided. Mowing machinery will not be used closer than 100mm to stems, and a nylon filament used where necessary.

Within the meadow area wildflowers and grasses will be allowed to set seed, but so that excessive vegetation encroachment can be controlled. Some thistle growth is to be actively managed as a good food source for birds.

In the second and subsequent years the meadow is to be managed to allow the grasses to grow tall, flower and seed from May through to July/August. The meadow should then be cut back annually in late summer to approximately 75-100mm, leaving uncut margins each year on alternate rotation. Autumn grazing or mowing could then be undertaken as deemed appropriate and all arisings removed to a compost heap. No grazing would be undertaken in wetter periods. The approach would be monitored by a suitably qualified professional.

The banks of the swales would be strimmed on rotation in sections to promote a diversity of potential habitats. Prior to cutting, all debris/litter in grassed areas is to be removed, including earth clods and stones larger than 25mm in diameter.

5.5.3 Woodland and Woodland Edge Planting

Woodland trees will be pollarded on a 5-20 year rotation as deemed appropriate to ensure the life of the tree. Dead wood can be used to create log piles at suitable locations on site.

Deadwood creates an important habitat for fungal and invertebrate species. It is recommended that standing deadwood will be left where it does not conflict with public safety. The amount of deadwood within the woods will be increased by leaving fallen and standing deadwood from harvesting operations.

Hawthorn will be coppiced on a 2-3 year rotation (33% per year) with the cuttings chipped/shred and spread around the base of each plant as mulch or removed off site. In Year 7-10 the hazel may be coppiced, as deemed appropriate.

It is recommended that a bat survey is undertaken prior to any felling or harvesting works. An initial survey can be completed by a competent person (eg: site manager) to assess if there is a high risk of bats present. If this is the case then expert advice / survey should be sought and the recommendations considered before proceeding with proposed felling works.

Woodland edge habitats are valuable for many insects and woodland birds such as the woodcock, tree pipit and lesser spotted woodpecker, as such the proposed restoration scheme promotes the graded edges of woodland.

Veteran trees will be identified and protected when undertaking timber harvesting operations or tree safety works.

5.6 Weed Control

It is acknowledged that under the provisions of the Weeds Act 1959, it is the responsibility of all occupiers of land - whether used for agriculture or not, to control injurious weeds, so that they do not spread. For all areas under Aggregate Industries control, weeds will be controlled by the appropriate application of herbicides by a certified competent person, according to manufacturer's instructions and in accordance with the Environment Agency Guidelines with regard to potential applications adjacent to watercourses/bodies or, in areas of grass, by cutting.

Furthermore, as part of the habitat management, where an individual plant species dominates an area, it may be beneficial to remove a proportion to allow other species to colonise or be introduced and increase species diversity. Section 14 of the Wildlife and Countryside Act 1981 prohibits the establishment of particular non-native invasive species listed in Schedule 9 Part 2 of the Wildlife and Countryside Act 1981 (variation 6th April 2010). Particularly invasive non-native plants which if found to be present would need to be eradicated include (for complete list refer to Schedule 9 Part 2 of the Wildlife and Countryside Act 1981):

- Giant Hogweed (*Heracleum mantegazzanium*) - poses a public health hazard because its sap will cause a skin rash in the presence of sunlight;
- Japanese Knotweed (*Fallopia japonica var japonica*) - forms dense thickets displacing native plants;
- Himalayan Balsam (*Impatiens glandulifera*) - spreads by seeds explosively propelled from ripened pods;
- Australian Swamp Stonecrop (*Crassula helmsii*) - quickly out-competes all native vegetation and maintains dominance through very rapid growth and uptake of almost all available nutrients;
- Parrot's Feather (*Myriophyllum aquaticum*) – propagates by growth from small fragments that are easily spread when the brittle stems break; and
- Floating Pennywort (*Hydrocotyle ranunculoides*) – forms dense interwoven mats that quickly cover water surfaces.

All areas of the site will be monitored for the aforementioned invasive plant species on at least a twice yearly basis, during the growing season. Where these plants are identified and where possible, appropriate measures, specific to the plant species will be taken to eradicate them, such as described by the Environment Agency leaflet 'Guidance for the control of invasive plants in or near fresh water'. The Environment Agency identifies the following basic methods of controlling invasive plants:

- Mechanical – cultivation, hoeing, pulling, cutting, raking, dredging or other machinery to uproot or cut plants;
- Chemical – herbicides to kill plants;
- Natural – specific pests and diseases to weaken the target plant; and
- Environmental – alteration of the environment to make it less suitable for plant growth.

Where weeds are to be controlled by the application of herbicides this will be carried out by a certified competent person, according to manufacturer's instructions (For example, NPTC Certificate of Competence for use of Pesticides). Herbicides will not be used within 10m of ponds, ditches or streams. It is also acknowledged that:

- The Food and Environment Protection Act 1985 requires approval from the Environment Agency before using herbicides in or near water (refer also to Environment Agency Guidance Notes AqHerb01: Agreement to use herbicides in or near water);
- A waste license is required to remove Japanese Knotweed to a waste disposal facility; and
- All waste materials, including weeds, are subject to the Duty of Care and must only be transferred to, and carried by, registered waste carriers.

5.6.1 Weed control within tree, shrub and hedgerow planting areas

All tree and shrub planting areas (outwith 10m of waterbodies) will be maintained free of vegetative competition (i.e. weeds) by the application of herbicide to a 1m diameter around

the base of each plant, using a controlled droplet applicator, or similar, to minimise spray drift, for the first three years after planting during Spring.

Hand weeding will also be undertaken with minimal disturbance to planting and reinstatement of soil depth as required. All tree and shrub guards will be kept free from weeds, by careful checking and folding out of any growth for spraying. This will be undertaken during late summer.

Some bramble growth is to be encouraged to provide valuable scrub cover for wildlife but any substantial increase in bramble cover will be checked.

5.7 Fertiliser

Fertiliser requirements will be assessed on an annual basis according to the vegetation type and condition.

Areas of grassland will not receive fertiliser as the residual nutrient pool within the soil will be sufficient to allow the development of the grass sward as floristically diverse grassland and discourage the dominance of competitive species.

Tree and shrub planting may receive slow-release fertiliser, applied to the base of each plant, according to manufacturer's instructions, at the end of the second growing season, following planting, if deemed necessary.

5.8 Replacements

All planting failures (including where removed, dies or becomes seriously damaged or diseased) will be replaced on an annual basis, to ensure 95% maintenance of the densities/land cover.

All replacements will use plants of the same species or other such species as may be agreed with the Local Planning Authority. If abnormal plant failures persist then investigations and proposals for the remedying of site conditions will be prepared and agreed with the Local Planning Authority.

5.9 Tree and shrub accessories

All guards and canes which have become loose, over-tight or broken will be re-adjusted and any plants that become loose will also be re-firmed and adjusted, during early spring, on an annual basis.

Stakes and tubes will be removed from trees and shrubs and disposed of at a suitable facility when the tubes split.

5.10 Irrigation/watering

Requirements for irrigation/watering will be assessed on an annual basis, in particular any new areas of planting and during the drier, summer months.

5.11 Fencing

All fencing will be checked regularly to ensure it is in sound condition, and any necessary repairs will be undertaken immediately.

6.0 CLOSURE

This report has been prepared by SLR Consulting Limited with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

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