PROPOSED KIRKBY TOWN CENTRE EXPANSION Outline Ecological Mitigation and Enhancement Proposals

1.0 Introduction

1.1 This report, prepared by Waterman CPM Limited on behalf of Tesco Stores Limited, sets out an the principles of a mitigation and enhancement strategy associated with the proposed Kirkby Town Centre Expansion. The strategy focuses on the reach of the Kirkby Brook and riparian areas within the Site boundary. The overall aim should be to design and manage the diverted channel to maximise its potential for wildlife, specifically local biodiversity target fauna and flora.

1.2 This report outlines the existing interest, the potential of the site, the objectives of the strategy, and finally management issues that need to be considered.

1.3 Opportunities to profile the brook channel and banks are generally limited, as there are overriding engineering considerations associated with flood risk and flow capacity requirements. None the less, there are real opportunities through appropriate riparian planting to create not only an attractive feature but also a local wildlife resource.

2.0 Summary of Ecological and Geomorphological Interest

2.1 The following section summarises the key features of interest; for further details see the following technical reports:

- River Corridor Survey – Proposed Kirkby Town Centre Expansion (C2883_06);
- Ecological Appraisal – Kirkby Town centre Extension (C2883_02a);
- Updated Water Vole Survey 2007 – Kirkby Town Centre Expansion (2883_05);
- Bat Survey and Assessment – Kirkby Town centre Expansion (2883_09).

Riparian Habitats

2.2 The Brook within the Site flows predominantly through landscaped parkland comprising largely of intensively managed amenity grassland.

2.3 Seeded wildflower meadows, and scrub and tree structure planting. The Brook runs close to and passes under the A506 dual carriageway as it flows into the Site at the upstream limit.

2.4 There is no semi-natural woodland associated with the Site. On the top of the embankment approximately 100 meters (m) to the east of the Brook is a linear strip of planted scrub and trees. Species present include alder (*Alnus glutinosa*), pedunculate oak (*Quercus robur*), ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*), guelder-rose (*Viburnum opulus*) and hazel (*Corylus avellana*).

2.5 Seeded wildflower meadows either side of the Brook provide habitats valued by nectar loving insects, in an otherwise species poor mown amenity grassland.

2.6 Short lines of Lombardy poplar (*Populus nigra Italica*) and scattered examples of other species such as Hornbeam (*Carpinus betulus*), oak (*Quercus robur*) and elm (*Ulmus* spp.) can be found within the parkland, generally 10-20m back from the Brook.

2.7 In closer association and occasionally overhanging the Brook can be found examples of weeping willow (*Salix chrysocoma*), crack willow (*Salix fragilis*) and white willow (*Salix alba*).

Brook Banks

2.8 In marked contrast to the heavily managed adjacent amenity parkland, the immediate surrounds of the Brook within the Site are unmanaged on both banks. There is a narrow 1-2m standoff at the top of the banks which supports the same plant communities as the Brook banks. The Brook lies within a steeply banked, heavily modified channel, dropping down 2-3m from the surrounding land level. The banks have been heavily infested with the alien plant Himalayan Balsam (*Impatiens glandulifera*). The balsam has largely suppressed native bank side species, however stands of the more vigorous perennials such as common comfrey (*Symphytum officinale*) and ragwort (*Senecio jacobaea*) can be found. Where overhanging trees cast shade, stands of common nettle (*Urtica dioica*) are present, interspersed with bare ground.

Brook Margins

2.9 Owing to the steepness of the banks running straight down to the channel, there is little marginal habitat. The margins are generally composed of soil or silt, and are vulnerable to localised slippage or wash-out. Emergent vegetation is very restricted but reed canary-grass (*Phalaris arundinacea*) and creeping buttercup (*Rununculus repens*) are present.

Brook Channel

2.10 The Brook channel is generally 1.5-2m wide and a 0.25-0.3m deep. The base of the channel is composed of a sandy/silt substrate with scattered rocks and small boulders. The flow rates along the section of the Brook at the time of survey was uniform and slow (approximately 0.2m/s), however scattered sand bars and islands have created small faster flowing riffles. Deeper pools within the Brook are rare and are generally no more than 1-2m in diameter; the exception is a large pool 10m down stream of the Site, associated with a meander bend in the Brook channel around a stand of willows.

2.11 Despite the narrow banks and tall overhanging vegetation, the north-south orientation of the channel allows fair to good light penetration to the channel along its length. This has enabled stands of floating sweet grass (*Glyceria fluitans*) to establish. The vegetation and overall ecological value of the river habitats is currently limited by the existing, heavily modified morphology of the river channel. There is however potential to create more interesting habitats by making changes to the channel morphology.

3.0 Key Ecological Issues

3.1 The key issues pertaining to the current length of the Kirkby Brook within the Site are:

- Canalised linear channel, with lack of variety of aquatic plants;
- Absence of two stage channel margins and meanders;
- Intensively managed adjacent habitats, with narrow stand-off from the banks;
- Widespread Himalayan balsam on banks and margins which is suppressing native riparian species;
- Lack of emergent and aquatic plants;
- Relatively high disturbance levels;
- Rubbish build-up in channels;
- Presence of water voles; and
- Importance of brook corridor for bats.

4.0 Conservation Objectives and Constraints

4.1 The overriding objective is that the Kirkby Brook diversion should generate a new channel of at least equal, ideally of higher, ecological value compared to the channel to be lost. This can be achieved through appropriate design, establishment and land term management.

4.2 The following management objectives have been identified and agreed with the Environment Agency (EIA):

- Objective 1: To maximise the ecological interest of the new Kirkby Brook channel.
- Objective 2: To maximise the ecological potential of the marginal habitats.
- Objective 3: To maximise the potential of the brook for water vole.
- Objective 4: To aid the realisation of the local biodiversity action plan objectives.
- Objective 5: To eradicate and prevent the return of invasive weeds.
- Objective 6: To ensure appropriate access and appreciation of the Brook, whilst minimising wildlife disturbance; and
- Objective 7: To maximise the potential pf the brook corridor for bats.

Potential Constraints

4.3 The overriding constraint to maximising the potential for the new channel for wildlife is the restricted area available for the new channel corridor. As currently proposed, the brook channel will run next to a flood retaining wall on its eastern side, with no room for natural landscaping (see **Plan 2883_14c**). A coach/car park hard-standing will extend up to the flood retaining wall. On the western side of the new brook channel will be a reduced strip of land running up to Valley Road (A506) which has been identified for natural landscaping.

4.4 The following specific constraints have been identified:

- The channel and banks profiling to meet necessary flood risk flow requirements;
- The limitation on marginal zones due to space constraints;
- The existing water quality;
- The variable flow rates and water depths;
- The presence of invasive weeds;
- The future levels of human disturbance; and
- High Intensity and inappropriate lighting disturbance.

Management Proposals

4.5 Generally consideration will have to be given to the long term management of the marginal and bank side vegetation along the new length of Brook; ideally an Ecological Management Plan should be prepared and agreed. This Plan should itemise annual commitments and could itemise supervisory and contractor costs.

Objective 1: To maximise the ecological interest of the new Kirkby Brook channel

Prescription:

Prepare a five year ecological management plan for the new channel and surrounds. Associated works to be costed up.

Objective 2: To maximise the ecological potential of the marginal habitats

Prescription:
There should be at least a 5m standoff (corridor) either side from the top of the channel embankment, to be managed to maximise wildlife interest.

Objective 3: To maximise the potential of the brook for water vole

Prescriptions:
Select aquatic and riparian flora mixes known as preferred foodstuff for water voles whilst providing cover.

Monitor water vole activity within the new channel for three years after construction.

Objective 4: To aid the realisation of the local biodiversity action plan objectives

Prescriptions:
Create unimproved grassland/wildflower meadow within the riparian corridor.

Plant local provenance trees and shrubs.

Avoid street and footpath lighting (nature and location) that could adversely affect bat activity.

Prescription: Identify fauna and flora

Objective 5: To eradicate and prevent the return of invasive weeds

Prescription:
The appointed specialist contractor will make regular visits to the site, monitoring re-growth of invasive weeds and undertake appropriate physical and chemical control. Use of chemical control to take due account of impact on native flora.

Objective 6: To ensure appropriate access and appreciation of the Brook, whilst minimising wildlife disturbance

Prescription:
Erect appropriate fencing to control human and canine access, provide controlled viewing points at locations which minimise the risk of fly tipping or rubbish.

5.0 Time Constraints for Mitigation Works

5.1 The re-alignment of the Kirkby Brook during the first half of 2008 requires a strict time-table to avoid potential infringement of wildlife legislation. The only acceptable time to translocate (or trap water voles) is late March or April (subject to weather conditions) to avoid capture or lactating females.

5.2 Trees and larger shrubs within the Brook corridor should be removed before the start of the bird breeding season in March. Should these arboricultural works be delayed, an experienced ecology will be required to check the trees before felling and sign them off as unoccupied. However, should evidence of bird breeding be recorded, it could result in a significant delay.

5.3 The earlier the new channel is constructed the better to allow for the seeded and planted bank-side and marginal vegetation to establish. The use of pre-seeded geotextile blanket should be considered as it will help to stabilise the banks, however, care should be given to the placement of such blanket material so as to not be a barrier to water vole burrowing activity when them move into the new channel in due course.

5.4 Water voles will be encouraged to vacate the old channel of their own accord, through management of the bank-side and channel vegetation to make it unsuitable for the species. Vegetation will be strimmed out and removed. Water vole activity will then be monitoring and as soon as it is confirmed hat the length of brook is clear of the species, then the end of the old channel can be sealed, and infilling completed as soon as possible afterwards.

5.5 The seeding and planting up of the brook surrounds up to the A508 can be completed at the same time as the brook seeding, accepting that direct access to the brook from management will continue from the eastern bank, both pre and post flood retaining wall construction and eventual laying of stadium coach park hard-standing laying.

5.6 Table 1 below Summarises the proposed Kirkby Brook mitigation work programme.

Months (2008)	January	February	March	April	May	June
Operations						
Remove of trees and shrubs		X				
Create of new brook channel			X	X		
Plant up of brook banks and surrounds			X	X	X	
Plant up of new brook channel					X	
Tran locate water voles			X	X		
Close and infill of old brook channel				X		