LAND NORTH OF EAGLETHORPE
WARMINGTON
NORTHANTS

Retrospective Section 73A Applications
to extend the timescale for

Construction of an Agricultural Reservoir together with
removal of surplus material arising in the course
of construction and the importation of a limited
quantity of engineering clay
(Permission EN/02/846C)

AND

Variation of Condition 3 of Planning Permission
EN/05/02356C to vary the details of the
plant and ancillary works on land north of
Eaglethorpe, Warmington, Northants
(Permission NCC/09/00047/MIN & EN/09/01072/NCC)

UPDATED ENVIRONMENTAL STATEMENT

on behalf of
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Document 1 – Updated Environmental Statement
Document 2 – Non Technical Summary
Document 3 – Retrospective Section 73A Applications
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NOTE: CD attached at back of report on inside cover
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UPDATED ENVIRONMENTAL STATEMENT

1. BACKGROUND

1.1 This Updated Environmental Statement has been prepared as part of the two
applications at this site to assess the impacts of the ongoing development consisting the construction
of an agricultural reservoir and the associated mineral processing plant on adjacent land. The
location of the sites are shown on plan 95010/PB/L attached.

1.2 The reservoir construction consists of engineering works that are necessary for the
farmholding being the excavation of the reservoir void in order that water can be stored. The
excavated material is principally minerals (sand and gravel) as well as some soils. It is proposed
that the excavated void is then sealed using imported engineering clay to complete the reservoir.
The development includes a substantial area of shallows/wetland which is designed to increase the
biodiversity of the locality (see plan 95010/R/3b/L attached).
1.3 In order to make best use of the excavated minerals a processing facility has been established on the adjacent land that lies outside/above the flood plain of the River Nene (see plan 95010/PS/D/1 attached). The material is excavated on a ‘campaign’ basis (approximately 4/5 times each year) and is delivered to a stockpile within the southern part of the plant site. The material is then processed by a modular plant to produce construction aggregates which are removed by lorry to the A605 via a purpose designed access. At completion the plant site will be fully restored back to agriculture.

1.4 The reservoir extends to 13 hectares approximately and is probably a little over halfway towards completion, the remaining volume to be excavated is estimated at 150,000 cubic metres (250,000 tonnes). This part of the development is covered by a separate permission to that for the plant site. The plant site permission extends to 8 hectares approximately of which some 6 hectares have been developed. The annual output of minerals has varied considerably over the life of the project, but is expected to be in the order of 100,000 - 120,000 tonnes annually for the remainder of the works.

1.5 In order to carry out the engineering, clay of suitable quality will need to be imported. This will initially be stockpiled in the reservoir excavation or on the plant site before being used to construct the sides and base of the reservoir under quality controlled and supervised conditions. This part of the works will commence once the reservoir excavation is complete.

1.6 Owing to a number of issues, not least the long period of low economic activity, the construction programme is running well behind the proposed schedule. Consequently two retrospective Section 73A applications were submitted to extend the timescales of both permissions to the end of 2018. Because mineral extraction is necessary in the course of the construction the applications were submitted to Northamptonshire County Council (NCC).

1.7 On receipt of the applications NCC considered that as the original ‘reservoir’ application was considered to require an Environmental Impact Assessment, the current Section 73 application should also have an Environmental Statement (ES) albeit mainly an update of any significant changes to the original ES.

1.8 It is relevant to note that the original ‘plant’ application did not warrant an Environmental Impact Assessment as it did not include mineral extraction, only processing.
1.9 This Statement has been prepared as an Updated Environmental Statement in response to the request from NCC. The principal area of impact remains the reservoir construction works, however the impacts of the plant site have also been included as the two developments are closely interlinked.

1.10 The Updated Environmental Statement comprises the following:

- Document 1 – Updated Environmental Statement
- Document 2 – Non Technical Summary
- Document 3 – Retrospective Section 73A Applications
- Document 4 – Original Environmental Statement – Volume 1
- Document 5 – Original Environmental Statement – Volume 2

Documents 3, 4 & 5 are only provided electronically and are on the disc attached to the back cover of this Statement.

2. ENVIRONMENTAL ASSESSMENT

2.1 Overview

2.1.1 The development (comprising both permissions) was commenced in late 2004/early 2005 and has taken place continuously since with little to no adverse impacts. Regarding the baseline position at the time the original ES was prepared there have been no material changes in terms of new or extended Nationally Designated sites, although part of the permitted site was designated a Local Wildlife site. There has been no new residential development that overlooks or is close to the site, nor has there been any changes to the flood zone boundaries.

2.1.2 The absence of any material or significant changes to the baseline position since the original ES was prepared indicates that the further period of time applied for will not cause any significant change to the originally assessed impacts or the mitigation measures proposed.

2.1.3 It is recognised that the current construction works have created a short term temporary change to the landform and land use of the reservoir site, but not the plant area. This change is significant in terms of ecology and further baseline work has been carried out.
2.1.4 The development details have not changed from that originally applied for and permitted, and NO new development is proposed by the Section 73 applications which are solely applying for an extension of time.

2.1.5 The EIA Regulations do not expressly require a developer to study alternatives (para. 85 of Circular 02/99). This circular also notes that development which comprises a change or extension may require an EIA only if it is likely to have a significant environmental effect (para. 46 of Circular 02/99).

2.1.6 In view of the nature of the application no alternatives have been considered other than to do nothing. This would effectively bring the development to an end which would require an alternative restoration/completion scheme to be prepared for the reservoir site. This would not deliver the biodiversity gains provided by the 'approved' scheme and would result in needlessly sterilising the remaining minerals. The plant site would still be restored back to agricultural use.

2.1.7 In summary the majority of the original assessment of the environmental impacts remains applicable for the extension of the timescales, the principle area of potential change is on the ecology.

2.2 Landscape and Visual

Baseline

2.2.1 The baseline has not changed since the original submission with no further landscape designations, either locally or on a wider basis. This is set out in the original ES at Volume 1.

2.2.2 There has been no new residential development near the site which is separated from the village of Warmington by the A605 which is on an embankment which is now densely vegetated as a result of specific landscape planting when the road was constructed.

2.2.3 The rights of way network remains the same, with a bridleway along the heavily wooded top of the ridge to the east of the site and a footpath that follows the toe of the road embankment along the south eastern boundary of the reservoir site.
2.2.4 In granting the permission it was recognised the ‘mature’ Poplar plantation in the north of the site was due to be felled which was carried out before the works commenced. Again, this loss of trees within the landscape was already part of the original assessment.

2.2.5 The current situation is that the whole of the area has been disturbed by the permitted works apart from the margins to the River Nene in the west and north and the wooded escarpment to the east. The environmental soil bund built along the southern boundary is to provide protection to the users of the footpath.

**Impacts and Mitigation**

2.2.6 The development has not resulted in any impacts that had not already been identified and for which mitigation measures provided. These are summarised below;

- Impacts to the public rights of way are mitigated by the existing soil bund for the footpath, and by the retained trees along the bridleway. The bridleway is also protected by the perimeter bund to the plant site.

- Impacts on the nearby residential properties remain unchanged. The planting along the A605 providing a visual screen that has become more effective as the planting matures.

- Similar comments apply to the mitigation protection provided by the retained established planting in the south west of the site to the few properties around Eagletonorpe Mill.

- The impact as a result of removing the Poplar plantation was identified as being very minor as any viewpoints of the trees are relatively distinct, their loss was part of a planned timber crop and the wooded escarpment still forms part of the wider panorama. No direct mitigation was considered warranted and the overall planting associated with the reservoir is designed to enhance/improve the landscape and visual setting of the site.

2.2.7 Regarding the plant area, this is very effectively hidden by the road embankment and landscape planting which noticeably reduces the visibility of the site within the immediate locality. The soil bunds along the boundaries contain the size of the plant site which is not overlooked by
any nearby properties and is well screened by the surrounding areas of mature woodland. No further mitigation is warranted.

Completion

2.2.8 The design of the reservoir is to create an area of shallows and wetland in the south that is the subject of a Management Plan for Creation of Wetland Habitat (Management Plan) (copy attached at Appendix 1), the object of which is to improve the landscape resource in this part of the valley. This will result in a net overall benefit that will increase as the area matures.

2.2.9 The plant site, following the removal of the plant, buildings, foundations etc. will be properly prepared to relieve any compaction and the original soils that are retained and used for the perimeter bunds will be carefully re-spread and the whole area returned to agriculture demonstrating there will be no residual impacts.

2.3 Access and Traffic

Baseline

2.3.1 The baseline position has not changed apart from the fact that the site is now operational, with all traffic accessing the A605 via a purpose designed junction that physically prevents cross-flow turning movement due to a central island.

Impacts and Mitigation

2.3.2 The traffic impacts were based on expected traffic movements of 120 (60 in, 60 out) per day. This is a robust daily average as it means the site is capable of removing 300,000 tonnes annually,

\[(60 \text{ lorries per day} \times 20\text{t/lorry} \times 250 \text{ days} = 300,000 \text{ tonnes})\]

2.3.3 The highway access design was based upon this ‘high’ average and incorporates a short length of central island to prevent lorries accessing the site having to either wait on the A605 or to turn across the flow of traffic. This has worked very well with lorries using the roundabout south of Warmington and / or that at the Services. There have been no accidents at this junction as a result of the mineral traffic.
2.3.4 During the first 3-4 years of the development the very poor market conditions resulted in annual sales below 50,000 tonnes, probably closer to 20,000 – 30,000 tonnes. Recognising that these low levels were severely delaying the construction the company appointed to remove/sell the minerals was replaced and the operation taken back in hand by the reservoir contractor.

2.3.5 This change, combined with the upturn in the economy has resulted in the target annual removal / sales of some 100,000 - 120,000 tonnes annually. Whilst this is still considered a maximum, it means the average daily level of traffic movements is half that used for the original assessment.

2.3.6 This indicates that the forecast impact of traffic is noticeably less than the actual levels and that the access layout and design, combined with use of the roundabouts works well. This demonstrates that no additional mitigation is warranted for the additional timescale requested.

*Completion*

2.3.7 Once the reservoir is completed the traffic generation will cease.

2.4 *Water/Flood Risk*

*Baseline*

2.4.1 There have been no material changes to the baseline conditions, namely the reservoir construction is in a Flood Zone 3, but that this type of development is considered water compatible. The plant site is located in a Flood Zone 1 so has little impact on the water environment or flood risk.

*Impacts and Mitigation*

2.4.2 The original ES recognised there could be impacts on surface and groundwater, flooding (flood risk), licensed abstraction and quality. The mitigation proposed is to work the site in short ‘campaigns’ which limits any impact temporarily as well as avoiding any dewatering being needed when the local watercourses are flowing close to bank full and to avoid periods of flooding/flood risk.
2.4.3 The current mitigation includes the following,

- any impact on surface water flows due to dewatering is mitigated by locating the discharge points to be upstream of the site,

- the period of dewatering is minimised due to campaign excavation,

- the exposed face of mineral is lined/covered with overburden clay to reduce ingress (note, this is not ‘engineering’ clay and is recognised as a temporary measure),

- dewatering (and discharge) does not take place when river levels are full or there is a risk of flooding,

- the reservoir site is on the edge of the flood plain, and ‘separated’ from the sand and gravel aquifer to the west by the River Nene so any temporary drawdown of groundwater is restricted by the river (acting as a recharge facility) along the western and northern boundaries. There is no aquifer to the east and south due to the escarpment.

- during the periods of dewatering all water is settled within the excavation in a basal sump and again by a polishing pond (or series of ponds) at ground level before discharge to ensure no derogation in quality,

- the potential impact on the licensed abstraction point at Wansford is principally associated with the abstraction licence for the reservoir, rather than the construction works. (Discussions with the EA and Anglian Water confirmed winter abstraction for the proposed volume will not have an adverse impact and this will be re-assessed at the time the reservoir is completed).
2.4.4 In terms of impacts to the water environment, including flood risk, the site has operated successfully without any adverse impacts since 2005 and well over half the site has been extracted. This demonstrates that the development, including the plant, working methods and mitigation measures, are effective and do not result in any adverse impacts on the water environment or on flood risk.

Completion

2.4.5 The original assessment concluded that the completed reservoir will not result in any adverse impacts and will result in a beneficial use of the water resources in the locality.

2.5 Agriculture

Baseline

2.5.1 The area of the reservoir was poor waterlogged land that was of low quality providing temporary summer grazing. The plant site was more productive land being located outside the flood plain.

Impacts and Mitigation

2.5.2 These remain unchanged from the original assessment with the temporary loss of the better land for the plant site not materially impacting on the overall farm viability.

2.5.3 Mitigation for the plant site is the retention of the original soil resource which is replaced at completion so there is no net loss in productive farmland. No specific mitigation is warranted for the reservoir site.

Completion

2.5.4 The completed reservoir is a net benefit to agriculture as it will provide an assured source of water for irrigation which will improve the yield and quality as well as the range of crops that can be grown on the Estate.
2.6 Ecology

Baseline

2.6.1 Prior to the start of the construction the reservoir area was a wet meadow in the southern part, with a mature Poplar plantation in the north; the plant site being part of an arable field.

2.6.2 The current position is that the majority of the reservoir site has been disturbed with over half being excavated with the remainder of land being ‘active’ in terms of construction as further engineering (and restoration) works are needed. The Poplars were clear felled as part of the woodland management of the Estate (i.e. they were due to be felled regardless of the reservoir) and the cleared area was left to recolonise as it is the final section of excavation.

2.6.3 The current ecological status of the reservoir area has been established through an extended Phase 1 Ecological Assessment that was submitted with the Section 73 application. The findings of the ecological surveys have been consolidated into an Ecological Assessment Report dated May 2014 and a copy is attached at Appendix 2.

2.6.4 The plant site, unlike the reservoir, is fully operational throughout the year comprising operational areas of bare ground that are constantly in use by the different stockpiles of materials and trafficking by the wheeled loaders and lorries. The silt settlement ponds are small and are regularly cleaned of wet silt that is temporarily stockpiled to drain before being moved to the ‘shallows’ area of the reservoir. In view of these ongoing activities there are no habitats that have any ecological interest within the plant area.

2.6.5 In view of the absence of any habitats of ecological interest within the plant area there will be no adverse impacts to ecology. The assessment has focussed on the reservoir site where there is greater interest, but again of a low order. The conclusions of the report are summarised below.

Designated Sites

2.6.6 There are no nationally designated sites within a 1 kilometre radius of the site but there are five non-statutory sites with one, Eagletonrpe New Lake being within the site. This was designated due to the presence of fen, marsh and swamp species. It is relevant to note that the water
body is referred to as 'new lake' suggesting that it is recently formed, and that the reservoir was under active construction when this new water body was designated.

2.6.7 The reservoir construction will impact on this water body with the need to remove the vegetation. The soils will be reused within the new 'shallows' area to create a suitable similar wetland habitat which is to be developed and managed under an approved Management Plan (see Appendix 1). The objective of the Management Plan is to compensate for any loss and to improve/increase the biodiversity within the locality at completion.

Vegetation

2.6.8 In addition to the vegetation within Eaglethorpe New Lake, the current disturbed nature of the construction area contains a range of habitats of local value comprising areas of mature scrub and unmanaged improved grassland. These have a low ecological value and are formed of common and widespread floral species.

2.6.9 The impact of the reservoir is that the majority of those habitats will be lost, other than the retention of the boundary vegetation which is principally grassland. No felling of any mature trees is proposed. Due to the low ecological value of the habitats and vegetation that will be lost the impact is minor.

2.6.10 The reservoir design from the outset included a large area within which wetland and shallows can be created using the indigenous clays and soils, the majority of which are retained on site. This new area will provide replacement habitat and is the subject of an Ecological Management Plan that is designed to deliver biodiversity benefit at completion of the construction.

Badgers

2.6.11 Whilst there are a number of badger setts within the wider area, the low lying nature of the site means it is unsuitable to support any resident badgers, but is likely to support foraging although no evidence has been identified on site in any of the surveys.

2.6.12 In light of the absence of any direct evidence of badgers being within or adjacent to the site no specific mitigation measures are proposed. The reservoir, once completed will reduce the potential area for foraging and this is in part mitigated by the higher quality habitat for badgers provided by the wetland area and reservoir margins.
**Bats**

2.6.13 The assessment noted that the site is suitable for foraging and that there are two trees that have potential for bat roosts. As the construction work does not require any mature trees to be felled, the impacts are restricted to the suitability of the site for foraging.

2.6.14 The construction works take place during daylight hours only so will have little to no impact on foraging which takes place at dawn and dusk. There will be no fixed artificial lighting at any time. The loss of terrestrial habitat to water may reduce the area suitable for foraging, but the combination of new aquatic and wetland habitat will provide good foraging habitat to mitigate any loss.

2.6.15 Again, the Ecological Management Plan will ensure that the new habitat will increase the botanical and invertebrate biodiversity which will improve/increase the capacity to provide a foraging resource for bats in the locality.

**Dormouse**

2.6.16 There is no habitat on site that is suitable to support dormice, so the proposals will not have an impact.

**Otter**

2.6.17 Otters are known to be present in the wider catchment of the River Nene and previous surveys have noted evidence on the section of the River Nene immediately north of the site. However, no evidence of otters has been found on the site.

2.6.18 It is noted that there is moderate potential for otters to use the river adjacent to the site for commuting or foraging but no holts have been identified and there is no habitat suitable for holt construction within the proximity of the site.

2.6.19 The impacts of the ongoing construction work will be indirect in view of the undisturbed margin that is retained to the river. The assessment notes that the dewatering discharge has the potential to affect quality and this is briefly addressed at paragraph 2.4.3 which notes that there have been no quality issues of the discharge water over the period of the workings to date.

D.K. Symes Associates
2.6.20 The only disturbance to the river bank is when the reservoir feeder channel is put in. This is a very simple short term (1-2 days) operation that will be carried out during daylight hours when otters are likely to be less active.

2.6.21 The new wetland habitat that is to be constructed together with its Ecological Management Plan will be a benefit to the local otter population.

*Water Vole*

2.6.22 The ecological surveys carried out to date have found no evidence of water voles on the site or along the bank of the River Nene where the river channel is open and exposed with very limited areas of suitable shelter. Generally the distribution of water vole throughout the wider River Nene catchment is poor which is believed to be due in part to the known presence of American Mink.

2.6.23 The generally disturbed nature of the construction site combined with regular fluctuation in water level as a result of dewatering makes this area unsuitable for water voles. The undisturbed margin to the river should ensure there are no impacts should water voles be present or subsequently occupy this stretch of bank.

2.6.24 The only potential impact is when the feeder channel is constructed. As stated above, this is a straightforward very short term activity and before any work is started the area will be inspected to see if there is any evidence of water voles. If present, the location of the feeder channel can be moved to avoid any impacts, but if this cannot be achieved the pre-construction work recommended in the ecological report will be followed (see para. 5.8.3 of the Ecological Assessment Report).

2.6.25 The completed reservoir scheme provides new wetland and aquatic habitats within the site as well as the feeder channel which are suitable for water voles.

*Birds*

2.6.26 The site forms a very small part of the wide expanse of the flood plain valley of the River Nene within which there is a large mosaic of scrub, water, fields, hedgerows and woods which support a wide variety and number of birds. The surveys that have been carried out on the
site have identified a range of birds breeding on the site as well as overwintering. The main interest was the overwintering population of Snipe in the locality that use the site.

2.6.27 The development has removed areas of scrub which is suitable for nesting birds. In order to avoid any direct impacts all clearance has taken place outside the recognised nesting season. The loss of this scrub is mitigated by the planting proposals as part of the completion works, but on a wider basis, any loss needs to be seen in the context of the locality where there is a large resource of similar suitable nesting habitat.

2.6.28 The disturbance of the construction works will be an impact of a low order which in part is mitigated by the campaign method of working. Once completed and the habitats of the reservoir and wetland begin to mature there will be a net increase in the range of habitat with the shallows and marshy grassland being suitable for Snipe and other overwintering birds.

Reptiles

2.6.29 The ecological report notes that the northern area of grassland between the River Nene and the boundary of the works provides a habitat that is suitable for reptiles and that previous surveys had identified a small population of Grass Snakes within the development area.

2.6.30 This area of grassland will not be disturbed by the development as it comprises the undisturbed margin/protection to the banks and setting of the river Nene. Currently there is a temporary earth bund that marks the boundary of the works and provides a physical barrier to prevent accidental encroachment. This bund is also suitable habitat for reptiles.

2.6.31 The temporary nature of the bund means that it has to be removed as part of the reservoir works. The impacts on any reptiles that may be present will be mitigated by a small-scale translocation exercise as the numbers are expected to be low. This will be carried out by suitably qualified ecologists through the installation of a reptile fence around the stockpile and the placing of refugia 'mats' in accordance with the recommendation at paragraph 5.10.3 of the Ecological Assessment Report (Appendix 2).

2.6.32 The completed design of the reservoir incorporates habitat that is suitable for reptiles within the ecological area in the south as well as the retained grass margins of the reservoir itself. This will provide a habitat that will not be disturbed by farming activity.
Great Crested Newt

2.6.33 There are no suitable water bodies on the site or within a 500 metre radius that are suitable to support breeding Great Crested Newts. The report considered it extremely unlikely that this species is present on the site or in the locality, consequently there will be no impact.

Invertebrates

2.6.34 The site contains a range of aquatic and terrestrial habitats that have the potential to support some rare or notable species. The construction works will have a short term slight adverse impact through the loss of habitat but this is mitigated by the habitat enhancement work proposed within the landscaping scheme for the completed reservoir.

Summary

2.6.35 The updated Ecological Assessment Report has focussed on the reservoir site rather than the plant site as this has little to no ecological interest as it is fully operational, and that restoration is back to farmland such that it should not be noticeable in the future that the area has been used to process minerals.

2.6.36 The survey baseline is the site as it exists at present towards the end of the construction period. No additional impacts have been identified that were not previously foreseen and the working methods and the mitigation that is included appear to have worked well with few, if any impacts.

2.6.37 There have been no material changes to the ecological setting of the site and the details of the completed scheme remain appropriate and will result in ecological benefits as originally conceived.

2.6.38 Whilst there have been some minor changes to the on site population of certain species, the construction works do no appear to have caused any decline in any species. If anything it appears there is the potential for a modest increase in reptiles due to the areas of undisturbed grassland that have established following the removal of the Poplar plantation in the north.

2.6.39 The conclusions reached by the recent report is that overall the current site is considered to be of moderate ecological value, that the ongoing construction works will have a short
term slight adverse impact, and at completion there will be a long term slight beneficial impact on ecology.

**2.7 Archaeology**

*Baseline*

2.7.1 The development of both the reservoir and the plant site have already impacted on the archaeology and no 'undisturbed' areas remain to be developed.

*Impacts and Mitigation*

2.7.2 Any impacts will have already occurred and appropriate mitigation was carried out in the form of a strip, map and sample exercise as the soils were removed.

2.7.3 In the Nene Valley, archaeological features are generally confined to where there were low 'gravel' islands within the wet marshy valley floor. The results of the archaeological work to date have found no features on the reservoir site as it is underlain by a thick sequence of peaty soils and clay. Regarding the plant site, any features that were present will have been recorded when the site was originally developed.

*Completion*

2.7.4 At completion any archaeological features that were present will have been lost, but suitable records will be available through the mitigation works.

**2.8 Noise**

*Baseline*

2.8.1 The Noise Assessment that was originally carried out identified that the proximity of the busy A605 dominates the background noise levels which are high at 45 - 47 LA90. There have been no material changes that will change the results as traffic levels remain high.
**Impacts and Mitigation**

2.8.2 In terms of the reservoir construction works, the mitigation is in two parts. The first is the campaign method of working which generates noise only when taking place, with relatively long periods of inactivity when no noise is generated. The second is the bund along the south east boundary which is designed to shield users of the footpath to noise from the construction works.

2.8.3 The activities in the reservoir site are now principally in the second and final stage of the construction programmes and generally over 300 metres from the small group of properties at Eagletonorpe Mill. These properties, and Warmington Village generally, have a high background level of noise due to the traffic on the busy A605. These two factors contribute to the lack of any concerns/complaints regarding noise from the reservoir and plant activities.

2.8.4 It is accepted that the construction activity will increase as the final reclamation works take place, including the shaping of the wetland area. It is not expected that these works will give rise to any unacceptable level, and also they will be short term (expected to be less than 8 weeks).

2.8.5 The plant area operates on a day-to-day basis and generates noise through the screening and washing process. The nearest properties are Lady Margarets Cottages which are some 300 metres away. They face onto the busy A605 so have high background noise levels because of which any noise from the plant site cannot be heard.

2.8.6 All the reservoir traffic goes past these cottages, but the average daily number of movements is small in relation to the traffic flow along the A605 resulting in no cumulative noise impacts.

2.8.7 The conditions for both permissions require a Noise Monitoring Scheme for the site and a copy of the Scheme is attached at Appendix 3. In the absence of any complaints, the noise mitigation measures in the form of perimeter bunds remain adequate and no further measures are warranted.
2.8.8 Following completion of the reservoir the only activity will be the abstraction of water from the reservoir which will be by electrically powered pumps which will not generate sufficient noise to be heard above the background levels.

2.9 Dust

Baseline

2.9.1 The baseline position is that dust is only likely to be generated when the site is active. In view of the damp low lying nature of the site reservoir the likelihood of dust is low during the campaign periods of activity. This is not the case for the plant site as this is active on a day-to-day basis and in periods of dry weather dust is generated from the wheels of the lorries.

2.9.2 The generally remote location of the plant site, combined with the perimeter bund and landscape planting, has ensured that there have been no complaints or concerns regarding dust throughout its operation.

Impacts and Mitigation

2.9.3 The impact from dust is visual as well as the potential to affect health (through breathing, sneezing, asthma etc.) and deposition on property, vehicles and plants. Dust comes in different sizes and for sand and gravel quarrying, which does not involve blasting or dry crushing, the dust particles are generally coarse (PM100). There is little to no risk of fine dust (PM10) being produced.

2.9.4 The mitigation measures at the site follow widespread good practice. Essentially they comprise ongoing visual checking on the site conditions to establish if dust is likely to arise. When these occur, it is almost invariably from the dry internal roads as a result of vehicle movements. To prevent/control this, the roads and operational areas are dampened with water either from a bowser and spray, or a hand held hose or using water from the bucket of the wheeled loader.

2.9.5 The absence of any complaints or concerns indicates this approach has worked well and kept any dust that might escape within the boundaries of the site.
2.9.6 In addition to the above it is worth noting that the stockpiles of sand and gravel all have a natural retained moisture content so 'sand blow' from stockpile is limited and if lifted will rapidly fall to ground within 100 metres. Processing is a 'wet' process so no dust is generated by the treatment plant.

2.9.7 The reservoir site is generally damp throughout the year so dust generation is unlikely. During the short campaign periods when the site is dewatered, the material is still damp due to the moisture content as are the internal roads. There is a risk of dust from the vehicles as they travel to the plant area and when this occurs the road will be dampened. It is worth noting that these 'active' periods are very short-term and only take place 4/5 times each year.

2.9.8 The final works for both areas is the replacing of the soils and general shaping. For the plant site, this needs to be done during dry conditions and excessive damping would be detrimental to soil replacement. The method of replacement is principally dump trucks and excavators which handle small volumes with limited tracking so dust generation is minimised. Should dust look like becoming a problem (probably due to weather) then activities will be temporarily suspended.

2.9.9 This problem is very unlikely to arise within the reservoir area due to the generally damp nature of the materials and the high level of the groundwater. However, if dust is likely to be a problem the activities will be temporarily suspended until such time as they can be safely resumed.

Completion

2.9.10 The only activity that may generate dust from the completed scheme will be the normal agricultural activities associated with farming the restored plant site.

2.10 Cumulative

2.10.1 There are no new or proposed schemes that are adjacent or close to the project that have any cumulative impacts.
3. CONCLUSIONS

3.1 This Updated Environmental Statement has been prepared to assess the impacts as a result of two retrospective Section 73 applications to extend the timescale to complete the approved construction of an agricultural reservoir and an associated processing plant and operations area.

3.2 There have been no material changes to the baseline position that prevailed when the permissions were granted.

3.3 The Updated Environmental Statement has not identified any new or additional impacts. The existing mitigation measures appear to be working well as the site has not given rise to any unacceptable impacts nor have there been any complaints or concerns from the statutory consultees or the local community.

3.4 The recent ecological survey has identified that due to the establishment of unmanaged grassland following the felling of the Poplar plantation in the north of the site, this has produced a habitat that is suitable for reptiles, most probably grass snakes. Additional mitigation is proposed through trapping and translocation.

3.5 The principal impacts were always identified with the reservoir site rather than the plant site. This latter site occupies a small part of a large arable field so had a very low ecological value. The whole area is actively disturbed on a day to day basis and there are no habitats that are of ecological interest. At completion this area will be restored back to farmland.

3.6 The permitted completed scheme for the reservoir includes a large area of swamp, wetland and water with the reservoir itself being surrounded by grassland. This has been designed to provide an increased range of habitats that will provide a permanent benefit to a wide range of species. This area will be managed in accordance with the approved Management Plan, with the capture, storage and use of the water for irrigation representing a sustainable approach to the use of this resource.
PLANS
APPENDIX 1

Management Plan for the
Creation of Wetland Habitat
Management Plan for Creation of Wetland Habitat at
Eaglethorpe, The Elton Estate

Checked by:...
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Notice to Interested Parties

To achieve the study objectives stated in this report, we were required to base our conclusions on the best information available during the period of the investigation and within the limits prescribed by our client in the agreement.

No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information. Thus, we cannot guarantee that the investigations completely defined the degree or extent of e.g. species abundances or habitat management efficacy described in the report.
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I  SUMMARY

This Management Plan has been produced to satisfy a planning condition for the construction of an agricultural reservoir on a site to the north of Eaglethorpe adjacent to the River Nene in Northamptonshire.

A management plan is required to set out practices to ensure compliance with wildlife legislation during construction and to set out a habitat creation, management and monitoring regime for a conservation area of wetland shallows to be created as mitigation for habitat loss due to the construction of the reservoir.

The management plan seeks to be acceptable to all parties involved, to at least return the site to its previous conservation value after construction of the reservoir, and to set up a timetable for enhancements and monitoring to ensure that the wildlife aims and priorities are met.

A species of invasive non-native plant, New Zealand Pygmyweed (Crassula helmsii), has been recorded on site. Another non-native species, Orange Balsam (Impatiens capensis) has also been recorded, although this species is not as invasive. It is envisaged that the Crassula would be dealt with most effectively by burying it on site during construction works (Environment Agency to be consulted on this), whilst Orange Balsam could be efficiently removed by cutting.

A small population of Grass Snakes were found on site (Ecoscope, 2003a); this management plan outlines methods for ensuring that individuals will not be killed or injured during construction.

Breeding birds recorded on site in 2003 included BoCC Red List species, such as Reed Bunting (RPS Ecoscope, 2003a). A previous survey also found breeding Redshank, Lapwing, Ringed Plover and Little Ringed Plover (Wigginton, 1998). A winter bird survey identified numbers of Teal, Snipe and Jack Snipe of local importance (RPS Ecoscope, 2003b).

In order to create wetland habitat suitable for bird species of conservation interest, the management plan recommends the creation of shallows with stepped levels, varying from 15 cm to 2 m depth, with gradual slopes of a maximum of 1 in 5 between levels. The surrounding land is to be made into marshy grassland kept at around winter water level, with some humps to provide islands and varied water levels in the event of flooding.

It is further recommended that some planting of emergent, marginal and aquatic vegetation be carried out in order to provide areas from which vegetation can spread around the shallows. Lists of recommended species are provided, including a list of species suitable for seeding the marshy grassland to provide cover and foraging opportunities for waders.

A table for monitoring measurable targets relating to the important features of the site is supplied, with most features requiring visits during summer to check on their status.

An ecological clerk of works should be appointed to oversee certain key stages of the habitat enhancements.
2 INTRODUCTION

2.1 Background

Site Location and Description

The site is the location of a proposed agricultural reservoir north of the village of
Eaglethorpe in Northamptonshire, and is owned by the Elton Estate. It is situated just south
of the River Nene, which will provide water for the reservoir and shallows when the river is
above a threshold level.

Planning Context

Planning permission for the reservoir was granted on 24th September 2004. Of the
conditions imposed by the planning authority, Condition 13 required the production of an
ecological management plan. The ecological management plan is expected to be implemented
as part of the statutory five year aftercare period required under the mineral extraction
licence.

2.2 Summary of Current Situation

Origin of Information

Information on the status of the site for informing this management plan is derived from
surveys taken of the site during 2002 and 2003 by Ecoscope Applied Ecologists and RPS
Ecoscope. These surveys include:

- An ecological scoping survey, carried out in June 2002, which included a Phase 1
  Habitat survey, scoping for protected species and a list of dominant plant species;

- A winter bird survey, carried out from November 2002 to March 2003 to identify
  any legally protected bird species or species of conservation importance;

- A breeding bird and reptile survey, carried out from March to July 2003 to record
  the numbers of birds breeding of all species, including species of conservation
  concern, and to assess the presence and likely population size of reptiles on site.

Overall Status and Wildlife Importance

The breeding bird survey (RPS Ecoscope, 2003a) identified 27 species of birds breeding on
site, an assemblage that equates to local importance. Of these, two species were BoCC Red
listed and five species were BoCC Amber listed. The two BoCC Red listed species Reed
Bunting and Song Thrush, were also UK BAP species. A previous survey by Wigginton
(1997) also identified Little-winged Plover, Lapwing, Ringed Plover, and Redshank as breeding
on site, of which the first is listed on Schedule 1 of the Wildlife & Countryside Act and the
last three are BoCC Amber listed.

The winter bird survey (RPS Ecoscope, 2003b) identified 47 bird species on site, with 22
being BoCC Red or Amber listed. The site held a wintering bird assemblage of local
importance, with Common Snipe and Jack Snipe of particular local importance.
The reptile survey (RPS Ecoscope, 2003a) found a low population of Grass Snake on the site. Grass Snakes are protected from killing and injuring under the Wildlife & Countryside Act (1981 and as amended).

The ecological scoping survey (Ecoscope Applied Ecologists, 2002), suggested the possibility that Water Voles and Otters may occur on the adjacent River Nene, as records for these species existed from the surrounding area. Surveys will be undertaken for these species prior to works which would affect riverbank habitat.

3 AIMS, OBJECTIVES AND PRIORITIES OF MANAGEMENT

3.1 Aims and Objectives

This management plan has been prepared to fulfil the condition of planning consent for an ecological management plan. This is to be achieved through the following objectives:

- The plan should be acceptable to all parties concerned, namely Northamptonshire County Council, English Nature, the Wildlife Trust and the Elton Estate.

- After the construction has finished, the site should seek to at least return to the conservation interest of the site as identified in ecological surveys carried out in 2002 and 2003.

- The plan should include a monitoring and review process sufficient in order to ensure that the conservation objectives for the site are achieved.

The specific aims of the management plan are:

1) To provide guidance on best practice operations to ensure protection of Grass Snakes during construction; and

2) To produce a wetland area that is of benefit to wildlife, in particular to Snipe, Teal and other water birds (see priorities below). This will be achieved through the following objectives:

- Removal of the non-native species New Zealand Pygmyweed *Crassula helmsii* from the site;

- Removal of the non-native species Orange Balsam *Impatiens capensis* from the site;

- Creation of a water body with shallows and wet mud areas to benefit waders and water birds;

- Planting of marginal, aquatic and emergent vegetation to provide cover and food for water birds and create habitat for other wildlife.

It is expected that the habitat created to achieve these objectives will also be of high value to other wildlife, including dragonflies, bats, Water Voles and Grass Snakes.
3.2 Habitat creation priorities

Whilst the creation of a wetland is expected to benefit various species, it is intended to be of most value to four breeding and wintering bird species (as well as waders generally).

Reed Bunting

Two pairs of Reed Bunting were recorded as occurring on site during the breeding season of 2003 (RPS Ecoscope, 2003). This species is a BoCC Red List species, as it has undergone a greater than 50% decline in UK breeding population over the last 25 years. The management plan seeks to enhance the value of the site for this species to breed.

Snipe

The numbers of this species recorded on site in the winter of 2002-2003 are considered to be of County significance for Northamptonshire (RPS Ecoscope, 2003b). The species is on the BoCC Amber List on account of a moderate (25 – 49 %) decline in UK breeding population over the last 25 years. The management plan seeks to conserve and enhance the overwintering value of the site to this species.

Jack Snipe

The numbers of this species recorded on site in the winter of 2002-2003 are considered to be of local importance, being an uncommon winter visitor to Cambridgeshire and Northamptonshire (RPS Ecoscope, 2003b). The management seeks to at least conserve the overwintering value of the site to this species.

Teal

Teal are another BoCC Amber List species, as more than 20% of the North West European non-breeding population occurs in the UK. A maximum count of 87 Teal was seen in the winter of 2002-2003 (RPS Ecoscope, 2003b). The management plan seeks to conserve and enhance the overwintering value of the site to this species.

Amber listed waders

Three to four pairs of Redshank, a BoCC Amber List species, have been recorded as breeding on site in the past, although none were recorded as breeding in 2003 (RPS Ecoscope, 2003). Four pairs of Amber listed Ringed Plover have been recorded as breeding on site in 1997 (Wigginton, 1998), although none were recorded in either the winter bird survey of 2002-2003 or the breeding bird survey of 2003 (RPS Ecoscope, 2003). Lapwings, another Amber listed species, were also recorded as breeding on site in the past, though not during the breeding bird survey of 2003 (RPS Ecoscope, 2003). It is envisaged that the management plan will provide more breeding opportunities for these species on site.
4 CONSTRAINTS ON MANAGEMENT

The delivery of a management plan is subject to practical constraints imposed by existing conditions. The following key constraints will need to be accommodated within the plan.

4.1 Hydrology

There are two sources of water for existing and proposed wetlands within the site: rainfall and the adjacent River Nene.

The system will operate as follows: During winter, the reservoir will recharge from the River Nene through the feeder channel. Once the water level in the reservoir reaches the level of the lip separating the reservoir from the wetland creation area, water will overspill and recharge this area. The water level in the wetland will therefore be dictated by the maximum water level in the reservoir during this period.

However, during the summer, when water levels in the reservoir fall due to abstraction, water in the wetland will be trapped by the lip and will be retained, subject to losses from evaporation only. The initial water level in the wetland will therefore be dictated by the height of the lip dividing the wetland from the reservoir, and will decline subsequently as evaporation occurs.

The ability to retain water within the wetland area represents an opportunity to provide wintering habitat at times of high water levels, and habitat for waders during times of diminishing water levels.

There is a risk that if a dry winter follows a dry summer, when the reservoir would be expected to be at a low level, there may be insufficient river flow to fill up the reservoir and replenish the wetland shallows. However, this risk is the same as the risk of the area not flooding during dry winters under current land use.

4.2 Pollution

When the reservoir and adjacent wetlands are created, it is not expected that there will be any potential local sources of point source pollution present. The only threat to the wetland area from this type of pollution would be from any pollution incident on the river during the time when the river is high enough to flow into the reservoir. Even if this occurs, the reservoir itself would be expected to act as a buffer between the river and the wetland, making the risk from point source pollution to be very low.

Diffuse pollution is likely to affect the river and hence the connected reservoir and shallows, and the River Nene flowing past Eaglethorpe is designated as a Eutrophic Sensitive Area (DEFRA, 2003). The vegetation planted has to therefore be largely tolerant of the consequences of higher nutrient levels. The use of natural colonisation in parts of the site will ensure that communities develop that are suited to the conditions.
4.3 Public Access

A bird hide will be installed on the side of the wetland area nearest to the A605. In order to prevent disturbance to birds from visitors accessing the hide, it is recommended that a dense screening hedge (e.g. Hawthorn) be planted along the access track leading up to the hide.

It is also recommended that in order to minimise disturbance, public access to the river bank is discouraged by allowing the development of a screen of scrub southwards from the hide, so that visitors to the site are restricted to the footpath and hide only.

5 HABITAT RESTORATION AND ENHANCEMENT WORKS

Three stages to restoration and enhancement are envisaged:

Stage 1 – site preparation

Stage 2 – physical wetland creation works

Stage 3 – planting, establishment and monitoring

5.1 Stage I – Site preparation

Pre-clearance works

Grass Snakes

Preparation of the site in advance of soil stripping and minerals extraction is required to ensure that Grass Snakes are not harmed. The population found during the reptile surveys was small, and it is therefore considered that a sufficient area of habitat will remain around the periphery of the site to allow the population to persist until habitat creation commences.

Actions therefore need to focus on displacing the Grass Snakes from the area to be excavated. This will be achieved by:

1) Placing artificial refugia (sheets of corrugated metal and / or roofing felt) in areas of habitat which will not be affected by site works (e.g. in the strip of land between the reservoir and the River Nene. This will provide places of shelter outside the works area and hence encourage Grass Snakes to move. Rubble mounds will be placed in strategic areas to provide basking sites, shelter and hibernation sites for reptiles.

2) Prior to soil stripping, Grass Snakes will be encouraged to move to the margins by strimming areas of suitable habitat to render them less favourable to reptiles. The sward is likely to be quite tall at the time of strimming, so initially, the cut will be to a minimum of 10cm in height. The next cut will be lower, and will be carried out on a warm day when reptiles will be active and therefore able to move out of the path of the strimmer. The site will be strimmed from the centre to the edges, to ensure that reptiles are not trapped in ‘islands’ of long grass that are subsequently mown. The sward will then be kept low with regular cuts to ensure that reptiles do not recolonise the site prior to soil stripping.
Additional surveys

A survey of the point where the reservoir feeder channel will join the River Nene will be carried out for Water Voles and Otters. It is not considered likely that an Otter holt will occur, but the presence of Water Voles is a possibility. Should any signs of these species be found, the location of the feeder channel will be positioned so that Water Vole burrows are not impacted.

The feeder channel will be designed to provide additional habitat for Water Voles; see Section 5.2 for details.

Crassula Removal

Objectives

The objective is the total eradication of *Crassula helmsii* from the site and hence the removal of the risk of this species infesting and dominating the wetland and reducing its value to wildlife.

Rationale

*Crassula helmsii* is an invasive, non-native species of aquatic plant from Tasmania. It grows over other aquatic vegetation, kills native plants and creates a poor, oxygen depleted habitat for aquatic animals (Newman, 2000). Since it grows in depths of up to 3 m, the entirety of the shallows in the created wetland habitat could potentially become swamped with this plant if it is allowed to remain on site. It is easily spread, with a 5 mm fragment of plant with a node being sufficient to start a new plant (Newman, 2000).

The Environment Agency should be consulted on the disposal of *Crassula*, even on site disposal, as this may be covered by waste disposal legislation.

Areas

*Crassula helmsii* is known to currently occur in an area of inundation vegetation in the west of the site.

Actions

Step 1. Confirm and clearly mark out and fence the perimeter of the area containing *Crassula helmsii* in a manner sufficient to deter people, larger mammals and machinery entering the area before disposal of the weed.

Step 2. Remove topsoils containing *Crassula* and place in stockpiles adjacent to bridleway.

Step 3. Carry out gravel extraction.

Step 4. Place *Crassula*-contaminated topsoil stockpiles at the base of the extraction void where the wetland area will be created.

Step 5. Cover with clays and soils from the next phase of overburden removal.
Step 6: Before the reservoir and wetlands are filled with water, the ground should be thoroughly surveyed for *Crassula*, in case fragments have been dropped and are growing. If found, the *Crassula* should be treated with Glyphosate. The Environment Agency should be consulted before herbicides are used near water.

Ensure during all operations where people or machinery come into contact with areas contaminated by *Crassula* that boots and machinery are washed thoroughly before leaving the site. This species has been known to spread between sites in the past in mud on boots and machinery.

*Orange Balsam Removal*

**Objective**

The objective is the removal of the non-native Orange Balsam from the site, and hence maximise the area of site that can be used by native vegetation and wildlife.

**Rationale**

Orange Balsam is a non-native species, frequent in parts of the southern UK, that is slowly increasing its range (State, 2003). Although not particularly invasive, it is still an alien species that reduces native species diversity.

**Area**

Orange Balsam was found as scattered individuals on site in the inundation grassland. However, seeds may have reached other parts of the site.

**Actions**

It is considered that Orange Balsam should be removed during the process detailed above for the removal of *Crassula*.

5.2 **Stage 2 – physical wetland creation works**

The proposed wetland comprises two key areas. First, a stepped wetland composed of permanently and seasonally inundated vegetation. The deepest part of this area will be up to 2m below maximum water depth and is expected to remain permanently inundated throughout the year. Second, marginal marshy grassland that will be inundated only during winter when water levels are highest.

**Depths, areas and slopes of shallows**

**Objective**

To create water at different levels that will be suitable foraging habitat to a wide range of water birds in winter, and continue to be valuable foraging habitat for waders and ducks, including Redshank and Teal, as the water levels drop through the summer months.
Rationale

Snipe require areas of very shallow water and wet tussocky grassland for wintering. Waders require areas of shallow water for wintering and for summer foraging. Teal require water at around 10 to 15 cm depth. Other dabbling ducks require around 30 cm water depth, and diving ducks around 2 m water depth (Game Conservancy, 1981). The deeper areas will also provide a refuge for aquatic invertebrates in summer as the water level drops in the shallows.

Area

The area involved will be around 2 ha in size, to the south and southwest of the reservoir.

Actions

An area of shallows, comprising a series of stepped levels and islands, should be created according to the following requirements (see Table 1). Figure 1 displays the depths and relative areas involved in side view. Depths given are from maximum water level expected in winter.

Table 1: Depths and Features of the Proposed Shallows

<table>
<thead>
<tr>
<th>Depth (cm) below max. water level</th>
<th>Percentage area of shallows*</th>
<th>Additional Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>40 %</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>10 %</td>
<td>On this level, at least 2 areas to be left at 20 cm depth to form islands when the water levels drop. The islands plus slopes (max. steepness 1 in 5) to comprise half of this level, i.e. 5 % of the shallows site.</td>
</tr>
<tr>
<td>75</td>
<td>10 %</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>10 %</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>10 %</td>
<td>On this level, at least 2 areas to be left at 5 cm depth to form islands when the water levels drop. The islands plus slopes (max. steepness 1 in 5) to comprise most of this level, i.e. around 8 % of the shallows site.</td>
</tr>
<tr>
<td>30</td>
<td>10 %</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>10 %</td>
<td></td>
</tr>
</tbody>
</table>

* To include slopes up to next level of a maximum gradient of 1 in 5

The surface of the shallows base, from 75 cm depth and shallower, should be covered with topsoil to provide a rich substrate for the growth of aquatic plants and invertebrates. The depths stipulated in the table above should be inclusive of topsoil.

The edges of each level and the islands should be scalloped as far as possible in order to form bays and spits, so as to maximise the amount of waters edge. A south or southeast facing spit on the north or west bank of the shallows should be covered with gravel to provide a loafing area for birds, and potential breeding site for Ringed Plovers.

Half of the islands created on each level (i.e. at 90 cm and 45 cm levels) should be capped with shingle, the other half of the islands with 20 – 30 cm of topsoil, and the topsoil-capped islands should be planted with emergent plants as described in subsection 6.5. These islands should provide resting and potential breeding sites for wildfowl and waders.
**Marginal habitats**

**Objective**

The objective for the surrounding area is to create an area that will be suitable for Snipe, Jack Snipe and other wintering wader species.

**Rationale**

Snipe, Jack Snipe and some other wader species forage within tussocky wet grasslands. These areas are seasonally inundated when water depths are highest during winter. This type of habitat is favoured by wintering water birds including Snipe and Jack Snipe. It could also potentially provide suitable breeding area for other waders.

**Area**

The area involved is between the area set aside for shallows and the boundaries of the site and the reservoir. This is expected to comprise around 30 m width around the shallows area, terminating at the northern corner of where the shallows meet the reservoir, and at the eastern corner of where the shallows meet the reservoir.

**Actions**

An area of marshy grassland and larger humps should be created according to the following criteria (depths given are from water level expected in winter)

- 80 % of the area around the shallows should be at 0 cm (around the water level expected in winter).
- 20 % of the area to be formed into two distinct humps of +20 cm, to act as islands during winters of above average water level, to include slopes of 1 in 5 maximum gradient.

The humps/islands should be positioned as far from the public footpath and A605 and other sources of disturbance as possible.

**Reservoir feeder channel**

**Objective**

The objective of the design and plantings of the reservoir feeder channel is to maximise the potential of this feature to provide habitat for Water Voles.

**Rationale**

Water Voles require well-vegetated ditches with a suitable substrate for burrowing. Such ditches will also provide good habitat for invertebrates and Grass Snakes.
Area

The feeder channel will connect the reservoir with the River Nene. Its precise location will depend on the results of surveys carried out to determine whether Water Voles are present.

Actions

The channel should be constructed as far as practicable according to the preferred features for Water Voles, which include:

- earth banks to facilitate burrowing;
- steep bank profile (>45°);
- high density and diversity of herbaceous bankside cover;
- high density (>40%) of emergent species cover, particularly sedges, rushes, Phragmites and Sparganium;
- high degree (>40%) of water surface cover from aquatic vegetation; and
- absence of bankside trees and shrubs.

Species listed in Appendix 1.2 should be planted / sown on the banks. Plant directly those species not so suitable for seeding, such as some rush and sedge species.

A grassland mix (those species listed in Appendix 1.3) should be sown on top of the banks.

If a particular sedge species cannot be sourced, then another shallow water sedge or rush species on the marsh plant or emergent plant list can be as a substitute. Sedges or rushes should be planted in groups to provide patches of cover for Snipe.

5.3 Stage 3 – Planting and establishment

Planting will be required within the two wetland areas described above as well as within the wet lips of the agricultural reservoir.

Planting of the shallows and wet lips of the reservoir

Objective

To create habitat that will benefit birds such as Snipe, Jack Snipe and waterfowl in winter, and benefit breeding water birds in summer. To create a natural landscaped edge to the agricultural reservoir.

Rationale

Snipe require tall vegetation to provide concealment over winter. Many duck species require seeds from aquatic and emergent vegetation for food in winter. Aquatic, emergent and marginal vegetation will support invertebrates, providing a food supply for duck and wader chicks in summer, as well as cover from predators.
Areas

The plantings will involve all depths of the shallows, and the wet lip areas of the reservoir.

Actions

A list of recommended species and preferred planting depths and propagation methods is given in Appendices 1.1 and 1.2.

Seeding and transplanting should be carried out in spring. Planting of emergents should be in a minimum of three 5 – 10 m long blocks around the shallows so as to ensure that suitable cover is built up in some areas within a short space of time, whilst other areas will remain more exposed initially. The Common Reed should be planted in a single block in a bay on the north or west side of the shallows. The recommended planting density is 4 per m². The resulting variation in cover will suit a wide range of species.

Common Reed, Common Clubrush, Branched Bur-reed and Yellow Flag should also be planted in the wet lip areas of the reservoir.

Aquatic species should be spread more evenly around the flooded area, and water edge / marsh plants should have their seeds widely dispersed around the edge of the shallows and the surrounding area.

The gravel covered islands and the gravel covered spit should not have any emergents or marginal plants planted on them.

When transplanting, roots should be kept wet. For non-rhizomatous species in particular, take as much of the soil/mud surrounding the rootball as possible.

If the emergent species listed in Appendix 1.2 cannot be easily obtained as a whole plant, then seed could be used instead, and spread over the relevant area. With regard to the aquatic species in Appendix 1.1, if a species cannot be easily obtained then more of another species on the list can be substituted in its place, but the aquatics should include at least one species of Pondweed Potamogeton sp. and one species of Stonewort Chara or Nitella sp.

Planting of Surrounding Areas

Objective

The objective of the plantings around the area of the shallows is to create wet grassland that will provide both cover for Snipe and Jack Snipe in winter, and an area suitable for waders to breed in summer with minimal disturbance.

Rationale

Snipe and Jack Snipe require both swamplike ground to forage for invertebrates, and cover in the form of tussock forming grasses, rushes and sedges. These grasses, rushes and sedges will also provide cover for nests and young of Reed Bunting and waders such as Redshank. Other plants will support and attract invertebrates to provide prey for juvenile birds.
A screen of low native bush species along the public footpath will minimise the amount of disturbance the birds may receive from passing people, in addition to providing wildlife habitat in their own right.

**Area**

The area involved is between the area set aside for shallows and the boundaries of the site and the reservoir. This is expected to comprise around 30 m width around the shallows area, terminating at the northern corner of where the shallows meet the reservoir, and at the eastern corner of where the shallows meet the reservoir.

**Actions**

Sow the seed of species listed in Appendix 1.3 as these are considered suitable for marshy grassland. The broad grassland type aimed for approximates to NVC type MG13 (Rodwell, 1992), adapted in light of the species known to already occur on site. Plant directly those species not so suitable for seeding, such as some rush and sedge species.

For the grassland mix, those species specified listed in Appendix 1.3 as occupying 5% or more of the final area are the key species required to create the characteristic grassland type. If seed of some of the remaining species cannot be sourced, then that species may be omitted provided the proportions of the other species in the mix are increased accordingly.

If a particular sedge species cannot be sourced, then another shallow water sedge or rush species on the marsh plant or emergent plant list can be as a substitute. Sedges or rushes should be planted in groups to provide patches of cover for Snipe.

Native Willow species, particularly Sallow species *Salix caprea* and *S. cinerea* should be planted along the south of the wetland area, to shield the shallows from the public footpath and hence reduce disturbance of the birds. Willows can be propagated and planted by cutting 30 cm long pieces of willow stem and pushing them two thirds of their length into damp ground.

**5.4 Sourcing of plant material**

In order to minimise costs and maintain local diversity, it is preferable to allow natural colonisation from existing sources of plant material.

However, in order to ensure that habitats mature quickly, it will be desirable to introduce plant material in some areas. Plants from retained areas of vegetation on site would be translocated in preference, although care would need to be taken to ensure that non-native species are not translocated as well.

There will not be a large amount of plant material available on site for translocation, so the second preferred option would be to translocate seeds/plants from elsewhere on the Elton Estate. This possibility will be evaluated further in consultation with the Estate managers.

Any species essential for habitat creation which cannot be obtained in this manner would need to be sourced from an external supplier. Local provenance stock would be obtained where possible.
5.5 Ecological Clerk of Works

It is recommended that an ecological clerk of works be appointed to review the plans of the shallows with construction engineers before the shallows are created, and to be available so as to ensure that the wildlife objectives are met should additional constraints be encountered during the work. The ecological clerk of works should check the site for the presence of breeding bird during the breeding season (March – late August) to ensure that construction and planting works do not disturb the nests of breeding birds.

The ecological clerk of works can also check for the presence of *Crassula* in the site after disposal and before the shallows are created, and can oversee and advise on the planting of the shallows and surroundings.

6 ONGOING MANAGEMENT

6.1 Grassland Management

*Objectives*

The objective of this is to maintain a grassland habitat with a diversity of vegetation heights suitable for a range of birds and other wildlife.

*Area*

The area involved is the marshy grassland around the shallows part of the site.

*Actions*

The marshy grassland area should be cut once per year in August, when any juvenile birds on site should have flown, and before birds arrive on the autumn migration. Frequent small patches of taller vegetation, particularly rushes and sedges, should be left to provide cover for Snipe. More rushes and sedges should be left towards the shallows.

Cutting should be to a minimum height of 10cm to avoid injury to Grass Snakes. Mower cuttings should be removed from the site. No fertilisers should be applied to the area.

If control of invasive weeds is considered necessary, the Environment Agency should be consulted before herbicides are applied, as the area is adjacent to a river.

6.2 Feeder channel management

*Objectives*

The feeder channel will be managed to a) ensure that water flow is not choked by vegetation and b) to maximise habitat potential for Water Voles.
Actions

When vegetation growth in the channel develops to the point where water flow might be impeded, the vegetation should be mown. Only one bank should be mown on each occasion; this will keep the channel open but allow vegetated banks to persist.

Mowing should take place in winter, and should be to a minimum height of 10cm. Cuttings should be removed.

7 TIMESCALE FOR ENHANCEMENTS AND MANAGEMENT

The following tables give the timetables for the habitat enhancements and management. Table 2 condenses the various activities that have to take place in order to create the habitats and features required under the ecological management plan. A timetable for ongoing management is outlined in Table 3.

Table 2: Timetable for Initial Habitat Restoration and Enhancement

<table>
<thead>
<tr>
<th>Habitat/Area</th>
<th>Prescription</th>
<th>Timescale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inundation area</td>
<td>Removal of <em>Grassula</em></td>
<td>First year</td>
</tr>
<tr>
<td>Shallows and surrounding area</td>
<td>Creation of stepped shallows and landscaping of surrounding marshy area</td>
<td>Between August and February of final year of project</td>
</tr>
<tr>
<td>Shallows</td>
<td>Planting of shallows with aquatic, emergent and marginal vegetation</td>
<td>Spring following creation of shallows</td>
</tr>
<tr>
<td>Reservoir</td>
<td>Planting of wet lips with selected emergent vegetation</td>
<td>Spring following creation of wet lips</td>
</tr>
<tr>
<td>Marshy grassland</td>
<td>Seeding of marshy grassland</td>
<td>Spring following creation of shallows</td>
</tr>
</tbody>
</table>

Table 3: Timetable for Ongoing Management

<table>
<thead>
<tr>
<th>Habitat/Area</th>
<th>Actions</th>
<th>Timescale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marshy grassland</td>
<td>Mowing, but leaving frequent small patches of taller rushes, sedges or other vegetation.</td>
<td>Once per year during August</td>
</tr>
<tr>
<td>Reservoir feeder channel</td>
<td>Occasional mowing of in-channel vegetation to ensure uninterrupted water flow to reservoir.</td>
<td>Mow half of channel each year (or every two years if growth is not rigorous) during November-January.</td>
</tr>
</tbody>
</table>
8 MONITORING

Requirement for monitoring

Wetlands change naturally over time, with habitats altering through the process of succession. In order to ensure the continuing conservation value of the site, and to ensure that the objectives of the management plan are achieved, regular monitoring will be required after the shallows and surrounding marshy grassland have been created. Review and alteration of the actions in the management plan may be necessary in order to achieve the plan's objectives.

Reviewing of the plan and the actions should be carried out by the Elton Estate in consultation with the local Wildlife Trust. The targets to be monitored, and conditions which may prompt review, are given in the Table 7 in Appendix 2.

In addition, the success of the wetlands in terms of attracting key bird species should be monitored. This would be achieved via a programme of summer and winter visits by an ornithologist to identify and count bird species on site. It is envisaged that four visits per year during the 5-year aftercare period should be sufficient to ascertain whether the desired bird species are occurring on site. Monitoring beyond this period would also be desirable.

Reporting Results

The results of the monitoring should be given to the local Wildlife Trust.

9 REFERENCES AND BIBLIOGRAPHY


http://www.introduced-species.co.uk/Species/plants/jewelweed.htm


APPENDIX I: RECOMMENDED PLANT SPECIES

Appendix 1.1. Aquatic Species

<table>
<thead>
<tr>
<th>Common Species Name</th>
<th>Scientific Name</th>
<th>Planting Depth</th>
<th>Propagation and Planting Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad Leaved Pondweed</td>
<td>Potamogeton natans</td>
<td>90 cm and 2 m</td>
<td>Transfer shoots with roots or push winteri-buds into clay balls to be thrown in.</td>
</tr>
<tr>
<td>Fennel Leaved Pondweed</td>
<td>Potamogeton pectinatus</td>
<td>90 cm and 2 m</td>
<td>Transfer cuttings.</td>
</tr>
<tr>
<td>Spiked Water-milfoil</td>
<td>Myriophyllum spicatum</td>
<td>60 cm and 75 cm</td>
<td>Push cuttings into the mud, or into a clay ball and thrown in.</td>
</tr>
<tr>
<td>*Yellow Water-lily</td>
<td>Nuphar lutea</td>
<td>2 m</td>
<td>Transfer rhizomes.</td>
</tr>
<tr>
<td>Starwort</td>
<td>Callitriche sp.</td>
<td>90 cm</td>
<td>Transfer plants.</td>
</tr>
<tr>
<td>Stonewort</td>
<td>Chara spp. and Nitella spp.</td>
<td>2 m</td>
<td>Drop in a pile (weigh down with stone if necessary)</td>
</tr>
<tr>
<td>Water Crowfoot</td>
<td>Ranunculus spp., especially R. peltatus, R. trichophyllus and R. aquatils</td>
<td>90 cm and 2 m</td>
<td>Push cuttings into the mud, or into a clay ball and thrown in.</td>
</tr>
</tbody>
</table>

* Species recorded as occurring on site
### Appendix 1.2. Emergent and Shallow Edge Species

<table>
<thead>
<tr>
<th>Common Species Name</th>
<th>Scientific Name</th>
<th>Planting Depth</th>
<th>Propagation and Planting Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Reed</td>
<td>Phragmites australis</td>
<td>60 cm</td>
<td>Transplant rhizomes.</td>
</tr>
<tr>
<td>Branched Burr-reed</td>
<td>Sparganium erectum</td>
<td>30 and 45 cm</td>
<td>Transplant rhizomes/corms.</td>
</tr>
<tr>
<td>Water Dock</td>
<td>Rumex hydrolapathum</td>
<td>45 cm</td>
<td>Transplant whole plants.</td>
</tr>
<tr>
<td>Arrowhead</td>
<td>Sagittaria sagittifolia</td>
<td>15 cm</td>
<td>Plant stolons, or push winter-buds into the mud.</td>
</tr>
<tr>
<td>*Lesser Pond Sedge</td>
<td>Carex acutiformis</td>
<td>15 cm</td>
<td>Divide and transplant rhizomes.</td>
</tr>
<tr>
<td>Amphibious Bistort</td>
<td>Persicaria amphibia</td>
<td>60 and 75 cm</td>
<td>By seeds or division.</td>
</tr>
<tr>
<td>*Yellow Flag Iris</td>
<td>Iris pseudacorus</td>
<td>15 and 30 cm</td>
<td>Transplant rhizomes.</td>
</tr>
<tr>
<td>*Brooklime</td>
<td>Veronica beccabunga</td>
<td>15 cm</td>
<td>Plant seed or transplant.</td>
</tr>
<tr>
<td>Common Clubrush</td>
<td>Schoenoplectus lacustris</td>
<td>45 and 60 cm</td>
<td>Divide and transplant.</td>
</tr>
<tr>
<td>*Water Plantain</td>
<td>Alisma plantago-aquatica</td>
<td>45 and 60 cm</td>
<td>From seed.</td>
</tr>
<tr>
<td>*Hard Rush</td>
<td>Juncus inflexus</td>
<td>20, 15 and 5 cm</td>
<td>Divide and transplant rhizomes.</td>
</tr>
<tr>
<td>*Soft Rush</td>
<td>Juncus effusus</td>
<td>20, 15 and 5 cm</td>
<td>Divide and transplant rhizomes.</td>
</tr>
<tr>
<td>*Compact Rush</td>
<td>Juncus conglomeratus</td>
<td>20, 15 and 5 cm</td>
<td>Divide and transplant rhizomes.</td>
</tr>
</tbody>
</table>
### Elton Estate Reservoir Management Plan

<table>
<thead>
<tr>
<th>Common Species Name</th>
<th>Scientific Name</th>
<th>Planting Depth</th>
<th>Propagation and Planting Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Creeping Water Cress</td>
<td><em>Rorippa nasturtium-aquaticum</em></td>
<td>15 cm and less</td>
<td>Transplant whole plants or from seed.</td>
</tr>
<tr>
<td>*Marsh Yellow Cress</td>
<td><em>Rorippa islandica</em></td>
<td>15 cm and less</td>
<td>Transplant whole plants or from seed.</td>
</tr>
<tr>
<td>*Common Spike-rush</td>
<td><em>Eleocharis palustris</em></td>
<td>Edge</td>
<td>Divide and transplant.</td>
</tr>
<tr>
<td>*Water Horsetail</td>
<td><em>Equisetum fluviatile</em></td>
<td>Edge</td>
<td>Transplant rhizomes.</td>
</tr>
<tr>
<td>Marsh Marigold</td>
<td><em>Caltha palustris</em></td>
<td>Edge</td>
<td>Transplant whole plants, or from seed.</td>
</tr>
<tr>
<td>Purple-loosestrife</td>
<td><em>Lythrum salicaria</em></td>
<td>Edge</td>
<td>From seed.</td>
</tr>
</tbody>
</table>

* Species recorded as occurring on site

### Appendix 1.3. Marshy Grassland Species

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Species</th>
<th>Scientific Name</th>
<th>Planting Depth</th>
<th>Propagation and Planting Technique</th>
<th>Percentage of Seed Mix</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Meadowsweet</em></td>
<td><em>Filipendula ulmaria</em></td>
<td>Edge and marsh</td>
<td>Transplant whole plants, or from seed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>False Fox Sedge</em></td>
<td><em>Carex otrubae</em></td>
<td>Edge and marsh</td>
<td>Divide and transplant rhizomes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Cyperus Sedge</em></td>
<td><em>Carex pseudocyperus</em></td>
<td>Edge and marsh</td>
<td>Divide and transplant rhizomes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Species Name</td>
<td>Scientific Name</td>
<td>Propagation and Planting Technique</td>
<td>Percentage of Seed Mix</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>----------------</td>
<td>-----------------------------------</td>
<td>------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Gyp E</em></td>
<td><em>Lycopodium europaeum</em></td>
<td>Marsh from seed</td>
<td>2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>C. C</em></td>
<td><em>Filago disticha</em></td>
<td>Marsh from seed</td>
<td>2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>C. P</em></td>
<td><em>Sorophylla roebickii</em></td>
<td>Marsh from seed</td>
<td>2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>C. F</em></td>
<td><em>Cardamine pratensis</em></td>
<td>Marsh from seed</td>
<td>2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>H. A</em></td>
<td><em>Epipactis himalayana</em></td>
<td>Marsh from seed</td>
<td>2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>C. B</em></td>
<td><em>Ranunculus repens</em></td>
<td>Marsh from seed</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>C. B</em></td>
<td><em>Dactylis glomerata</em></td>
<td>Marsh from seed</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>C. B</em></td>
<td><em>Atriplex semistipa</em></td>
<td>Marsh from seed</td>
<td>30%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>M. F</em></td>
<td><em>Agrostis sibirica</em></td>
<td>Marsh from seed</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>R. M</em></td>
<td><em>Agrostis capillaris</em></td>
<td>Marsh from seed</td>
<td>40%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Species recorded as occurring on site*
APPENDIX 2: POST ENHANCEMENTS MONITORING

Monitoring Targets, Timetable and Responsibilities

<table>
<thead>
<tr>
<th>Habitat / Species of Interest</th>
<th>Targets to monitor</th>
<th>Monitoring Responsibility</th>
<th>Timescale</th>
<th>Criteria for review of management plan</th>
<th>Actions in light of review</th>
<th>Responsibility for Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Crassula helmsii</em></td>
<td>Absence of <em>Crassula</em> from shallows and surrounding area</td>
<td>Elton Estate</td>
<td>Annually in summer</td>
<td><em>Crassula</em> found</td>
<td>Confirm identification, seek advice from Environment Agency on use of chemical controls</td>
<td>Elton Estate</td>
</tr>
<tr>
<td>Emergent Vegetation</td>
<td>Amount of emergent vegetation cover should increase each year up to 30% of area of shallows.</td>
<td>Elton Estate</td>
<td>Annually in summer</td>
<td>Emergent vegetation cover fails to increase each year towards 30% cover</td>
<td>Consult with Wildlife Trust and others to determine reason for poor establishment and rectify situation accordingly</td>
<td>Elton Estate in consultation with Wildlife Trust</td>
</tr>
<tr>
<td>Shallows</td>
<td>Coverage by emergents, especially reed, should be under 30% of the shallows area.</td>
<td>Elton Estate</td>
<td>Annually in summer</td>
<td>Greater than 30% coverage by emergents</td>
<td>Undertake annual cutting in autumn of the excess area of emergent vegetation</td>
<td>Elton Estate</td>
</tr>
<tr>
<td>Marshland Vegetation</td>
<td>Rushes and sedges should establish as clumps within a year of planting</td>
<td>Elton Estate</td>
<td>Annually in summer</td>
<td>Rushes and sedges fail to establish</td>
<td>Consult with Wildlife Trust and others to determine reason for poor establishment and rectify situation accordingly</td>
<td>Elton Estate in consultation with Wildlife Trust</td>
</tr>
<tr>
<td>Habitat / Species of interest</td>
<td>Targets to monitor</td>
<td>Monitoring Responsibility</td>
<td>Timescale</td>
<td>Criteria for review of management plan</td>
<td>Actions in light of review</td>
<td>Responsibility for Actions</td>
</tr>
<tr>
<td>------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>---------------------------</td>
<td>---------------</td>
<td>-------------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Wintering Birds</td>
<td>Numbers of Snipe recorded should increase each year after shallows creation until at least equal to numbers found in winter of 2002-2003</td>
<td>Elton Estate</td>
<td>Annually in winter</td>
<td>Snipe fail to return to site, remain at a level lower than found in winter 2002-2003 and fail to increase in numbers over a 3 year period</td>
<td>Consult with Wildlife Trust and others to determine reason for low numbers of Snipe and rectify situation as necessary</td>
<td>Elton Estate in consultation with Wildlife Trust</td>
</tr>
<tr>
<td></td>
<td>Jack Snipe should be recorded as present on site at least every other year</td>
<td>Elton Estate</td>
<td>Annually in winter</td>
<td>Jack Snipe are not seen on site, or only very rarely</td>
<td>Consult with Wildlife Trust and others to determine reason for lack of Jack Snipe and rectify situation as necessary</td>
<td>Elton Estate in consultation with Wildlife Trust</td>
</tr>
<tr>
<td></td>
<td>Numbers of Teal recorded should increase each year after shallows creation until at least equal to numbers found in winter of 2002-2003</td>
<td>Elton Estate</td>
<td>Annually in winter</td>
<td>Teal fail to return to site, remain at a level lower than found in winter 2002-2003 and fail to increase in numbers over a 3 year period</td>
<td>Consult with Wildlife Trust and others to determine reason for low numbers of Teal and rectify situation as necessary</td>
<td>Elton Estate in consultation with Wildlife Trust</td>
</tr>
<tr>
<td>Reed Bunting</td>
<td>Reed Bunting should be found to be breeding on site within 3 years of the creation of the shallows</td>
<td>Elton Estate</td>
<td>Annually in summer</td>
<td>Reed Bunting fail to breed on site even after 3 years</td>
<td>Consult with Wildlife Trust and others to determine reason for lack of Breeding Reed Bunting and rectify situation accordingly</td>
<td>Elton Estate in consultation with Wildlife Trust</td>
</tr>
<tr>
<td>Habitat / Species of Interest</td>
<td>Targets to monitor</td>
<td>Monitoring Responsibility</td>
<td>Timescale</td>
<td>Criteria for review of management plan</td>
<td>Actions in light of review</td>
<td>Responsibility for Actions</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------------------</td>
<td>--------------------------</td>
<td>-----------</td>
<td>----------------------------------------</td>
<td>----------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Waders</td>
<td>Red or Amber listed waders should return to breed on site within 3 years of the creation of the shallows</td>
<td>Elton Estate</td>
<td>Annually in summer</td>
<td>No Red or Amber listed waders breeding on site even after 3 years</td>
<td>Consult with Wildlife Trust and others to determine reason for lack of breeding waders and rectify situation as necessary</td>
<td>Elton Estate in consultation with Wildlife Trust</td>
</tr>
</tbody>
</table>
Figure 1: Profile across Shallows Area and Surrounding Marshy Grassland

Horizontal Scale 1: 1,000
Vertical Scale 1: 100

Northeast

Southwest

Key:
- Marginal and clump vegetation
- Emergent vegetation
- Aquatic vegetation
- Island on this level
- Expected extent of water in winter
- Ground

Willow Mere House, Camperdown Business Park, Stocks Bridge Way, St Ives, Cambridge CB27 9XH
Tel: 01223 466332 Fax: 01223 466911

RPS 16/05/06
APPENDIX 2
Ecological Assessment Report
LAND AT ELTON PARK, ELTON, PETERBOROUGH

ECOLOGICAL ASSESSMENT REPORT

Final Document
May 2014
LAND AT ELTON PARK, ELTON,
PETERBOROUGH

ECOLOGICAL ASSESSMENT REPORT

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APPENDICES

Appendix 1 Protected Species Legislation

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EXECUTIVE SUMMARY

- The extraction of minerals and construction of a reservoir at the Elton Park site was commenced in 2008 following the granting of planning permission for the works. The current planning permission has now expired and an extension for the existing planning applications is being undertaken. As part of this extension to the planning application, ECOSA have been commissioned to undertake an assessment of the likely ecological impacts of the scheme.

- This report outlines the potential ecological impacts of the on-going mineral extraction and reservoir creation. The existing baseline conditions have been assessed based on a review of ecological surveys and reports produced for the original planning application, an updated desk study to incorporate any new records of protected species and a Phase 1 ecological assessment undertaken on 3rd May 2013.

- The survey area is a plot of 16.15 hectares of floodplain south of the River Nene, which formally comprised grassland and dense and scattered scrub. Mineral extraction works are now well underway, with the reservoir taking shape in the south-western half of the site. The north-eastern area is part flooded by pumps from the reservoir. The northern-most part of the site comprises scattered scrub and improved grassland habitats. The vegetative habitats on the site are of low to moderate ecological value.

- No signs of badger were identified on the site and it is considered unsuitable to support badger sets due to regular flooding. Badgers are known to be present in the wider area and foraging and commuting badger may enter the northern-most part of the site, where there are drier areas and good foraging potential within grassland and scrub habitats.

- A Phase 1 bat assessment was undertaken of the trees at the site, the majority of which are not of a suitable maturity or structure to support features that could be used by roosting bats. A group of mature trees in the south-west corner of the site contains three specimens with low potential to support roosting bats due to the presence of holes, splits and snags. The site is suitable for supporting foraging and commuting bats, which are likely to use the offsite woodland belt to the east and would find excellent foraging opportunities over the flooded areas, the scattered scrub in the north of the site and along the River Nene, off-site to the north.
• There are no hedgerows or other suitably structured vegetation within the site that could support dormice.

• The River Nene forms the northern and western boundaries of the site, and provides moderate quality habitat for otter and low quality habitat for water vole. No signs of these species were identified during the survey. However, otters are known to use the channel for foraging and commuting. The habitat is considered to be more open than would be optimal for water vole, although it is possible that this species may disperse through this part of the water course from other areas.

• The flooded habitat in the north-east of the site and the large adjacent area of scattered scrub provide an unusual habitat interface in which there are likely to be high levels of breeding bird activity. Previous surveys have identified the site as being of moderate local importance for winter bird populations including common snipe and jack snipe.

• A swath of improved grassland along the north-west boundary, parallel to the River Nene, has potential to support common species of reptile and a low population of grass snake was found during previous surveys. This area will not be affected by the proposals. A topsoil stockpile has been created to line the river corridor, which may also provide suitable reptile habitat.

• The site supports unstable flowing and flooding aquatic habitats that are considered unlikely to support great crested newt. Overall the site is deemed as having negligible potential to support great crested newt.

• The site is designated as a Local Wildlife Site (LWS), Eaglef Thorpe New Lake, due to the presence of a number of wetland indicator species.

• In the short term, due to direct loss of habitat and disturbance, it is anticipated that there will be a slight adverse impact on foraging bats, breeding and overwintering birds, otters, water vole, common reptiles and invertebrates. There is also anticipated to be a short term slight adverse impact on the Eaglef Thorpe New Lake LWS due to the loss of habitat during the reservoir construction. No significant impacts are likely and the construction of the reservoir is not anticipated to have an adverse impact on the local conservation status of any of the species affected.
• As part of the original planning application, an ecological management plan was produced which provides details on the mitigation and enhancement measures that will be implemented to minimise the ecological impacts of the works. This management plan is currently being implemented as part of the on-going mineral extraction and reservoir construction works and the management plan will be carried through as part of the extension to the planning application.

• Under the management plan, a significant area of the site will be managed for ecology. The southern third of the reservoir will include shallow water at varying levels with gentle slope profiles. The margins of the reservoir will be planted with a range of native species and new native marshy grassland will be created around the perimeter of the new reservoir. In the long-term, following the establishment of these habitats, it is likely that there will be a long term slight beneficial impact on ecology.
1.0 INTRODUCTION

1.1 Background

Ecological Survey & Assessment Limited (ECOSA) have been contracted by Ingelbourne Valley Limited and D. K. Symes Associates to undertake an ecological assessment of an area of land on the Elton Park estate, north of Eagletorpe in Elton, Peterborough. The site is centred on National Grid Reference (NGR) TL 07707 92103.

The ecological assessment is required to assess the potential ecological impacts of a retrospective planning application to extend the timescale by five years for the:

"Construction of an Agricultural Reservoir together with removal of surplus material arising in the course of construction and the importation of a limited quantity of engineering clay (Permission EN/02/846C)"

AND

"Variation of Condition 3 of Planning Permission EN/05/02356C to vary the details of the plant and ancillary works on land north of Eagletorpe, Warmingt, Northants (Permission NCC/09/00047/Min & EN/09/01072/NCC)"

As part of the original planning application, a number of previous ecological surveys and reports have been prepared for the site. These include the following documents which have been reviewed as part of this ecological assessment report:

- Proposed Lake Clearance and Duck Pond Creation - Ecological Protection and Enhancement Report¹
- Management Plan for Creation of Wetland Habitat at Eagletorpe, The Elton Estate²
- Winter Bird Survey of Land at Elton Estate, Peterborough³
- Otter and Water Vole Survey, Elton Estate, Northamptonshire⁴
- Breeding Bird and Reptile Survey of Proposed Reservoir Site⁵

⁵ RPS (2003) Breeding Bird and Reptile Survey of Proposed Reservoir Site

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1.2 Aims and Scope of Report

This report is based on the findings of the Phase 1 ecological assessment carried out by ECOSA on 3rd May 2013, the results of an updated desk study undertaken in September 2013, and a review of previous ecological reports and management plans as outlined above (Paragraph 1.1). This information allows an assessment of the biodiversity value of the site and the potential ecological impacts of the proposed development to be made.

1.3 Site Setting and Description

The site is an area of land within Elton Park, a 15 kilometre² (km) estate surrounding Elton Hall in Elton, Peterborough. The site is situated immediately north of the A605 trunk route between Oundle (6.5km to the south-west) and Peterborough (13km north-east of the site).

The River Nene forms the site’s north-western boundary and feeds a pool within the northern tip of the site. The surrounding landscape is rural and comprises a mosaic of agricultural arable land interspersed with hedgerows, country lanes and watercourses amongst a network of rural villages west of the cathedral city of Peterborough.

The surveyed site within the Elton Park estate comprises 16.15 hectares (ha) of land, 1.23km to the south-west of Elton Hall. The south-western half is occupied by an active aggregates operation in which a large reservoir is being created. Water from the reservoir is continuously pumped into adjacent former grassland in the north-eastern half of the site. The northern-most area supports scattered scrub and a belt of improved grassland runs the length of the north-west site boundary.

The site is situated in the West Anglian Plain Natural Area, described by Natural England as follows:

"The West Anglian Plain Natural Area comprising flat or gently rolling land with managed hawthorn hedges and occasional ancient woods, separated by extensive tracts of intensively managed arable land. The plain is drained by the large, slow-flowing River Ouse and River Nene (and a small stretch of the River Welland) and a multitude of smaller watercourses including small drains. In many of the valleys of these major watercourses lowland meadows occur on the seasonally flooded (winter and spring) alluvium. The West Anglian Plain also has an extensive series of old flooded

---

6 Natural Areas are defined by Her Majesty's Stationery Office as biogeographic zones which reflect the geological foundation, the natural systems and processes and the wildlife in different parts of England, and provide a framework for setting objectives for nature conservation" (Biodiversity: The UK Steering Group Report, HMSO, 1995).
gravel pits, clay pits and reservoirs, many of which have swamp vegetation or reedbeds along their margins.

The geology of the West Anglian Plain is characterised by Jurassic and more recent Pleistocene deposits and the Earth heritage interest is focused on different exposures, many of which are extremely rich in fossils such as ammonites, sea-urchins, fish, reptiles and rare dinosaurs."

1.4 Site Proposals

The primary purpose of the development is to build an agricultural reservoir within the low lying land adjacent to the River Nene. As the majority of the surplus materials are good quality sand and gravel, this material is processed on-site to make best use of the deposit. Planning permission was originally granted for the proposed works in 2002. However, this permission has now expired and an application for the extension of planning permission is required. The site proposals of the new planning application have not been altered.
2.0 METHODS

2.1 Introduction
This section details the methods used during the extended Phase 1 ecological assessment undertaken at land on the Elton Park estate, north of Eagiethorpe in Elton, Peterborough.

2.2 Desk-Based Assessment Methods
The Multi-Agency Geographic Information for the Countryside (MAGIC) website was accessed on 10th May 2013 for information pertaining to statutory designated nature conservation sites located within a 1km radius of the site.

Records were obtained from Northamptonshire Biodiversity Records Centre (NBRC) and Northants Bat Group for records of protected and notable species and details of statutory and non-statutory designated conservation sites located within a 1km radius of the site. Information was received from NBRC on 6th September and from the Bat Group on the 13th September 2013.

A review of previous ecological reports and protected species surveys as outlined above (Paragraph 1.1) has been undertaken. The results of previous surveys and records are considered in the assessment of the value of the site and potential ecological impact of the proposals.

2.3 Phase 1 Ecological Field Survey Methods
The Phase 1 field survey was carried out on 3rd May 2013. The survey involved a walkover of the site to identify the broad habitat types present and to record evidence of any protected species such as badger Meles meles, bats, dormouse Muscardinus avellanarius, breeding birds, reptiles and great crested newt Triturus cristatus. Details of the species-specific survey methods are given below.

2.3.1 Vegetation
An assessment was made of all areas of vegetation within and immediately adjacent to the site. This involved a walkover survey to identify broad vegetation types and a list of characteristic plant species was compiled.

2.3.2 Badger
The survey involved a detailed investigation of the site to identify evidence of badger residence, foraging or territorial activity. Particular emphasis was placed on locating badger setts, paths, and signs of territorial activity such as latrine sites.
2.3.3 Bats

An assessment was made of the suitability of trees on the site to support roosting bats based on the presence of features such as holes, cracks, splits, exfoliating bark and ivy cladding. An assessment was made of the suitability of the site and the surrounding landscape to support foraging and/or commuting bat species. The survey conformed to current Bat Conservation Trust guidelines.7

2.3.4 Dormouse

The dormouse survey was based on an assessment of habitat features that may indicate that dormice are present on site. This includes the presence of food sources such as common hazel Corylus avellana and honeysuckle Lonicera periclymenum. Additionally, the species requires a continuum of resources so that habitat structure, diversity and connectivity to adjacent areas of woodland/scrub are important features for determining the potential presence of dormice.

2.2.5 Otter and Water Vole

The southern bank of the River Nene that forms the northern site boundary was assessed for its potential to support otter and water vole by reference to bank structure and the bank-side vegetation. Water voles generally require sloping banks in which to burrow and well developed bank side vegetation to provide shelter and food. During the survey attention was paid to the presence of burrows, latrines, feeding remains, trails and footprints. For otter, a similar examination was carried out in search of spraints, footprints, couches, or any evidence of the presence of a holt.

2.3.6 Breeding Birds

The assessment of breeding birds on the site was based on the suitability of habitat present, evidence of nesting such as old or currently active nests and the presence of bird species that may potentially nest within the available habitat.

2.3.7 Reptiles

The reptile survey was based on an assessment of the suitability of habitat present within the site to support a population of common reptiles. Reptiles particularly favour scrub and grassland interfaces and the presence of these is a good indication that reptiles may be present on site. In addition, reptiles may utilise features such as bare ground for basking, tussocky grassland for shelter and compost heaps and rubble piles for breeding and/or hibernating. The quality of habitat within the surrounding landscape is also a useful indicator of whether reptiles are likely to occur at a site.

---

2.3.8 **Great Crested Newt**

The great crested newt survey was based on an assessment of the presence of suitable aquatic habitats such as ponds within or adjacent to the site and the presence of suitable terrestrial habitat. Ponds that are densely shaded, highly eutrophic or that contain fish are likely to be less suitable for this species.

In addition, online mapping resources were used to identify the presence of ponds or other waterbodies within a 500 metre (m) radius of the site. The 500m is a standardised search radius to assist in the assessment of the potential of a site and its surrounding habitat to support this species, based on current Natural England guidance.⁶

2.3.9 **Terrestrial Invertebrates**

An assessment was made of the site for its potential value to support diverse communities of invertebrates or any Biodiversity Action Plan (BAP) or scarce species. The assessment was made based on the presence of habitat features which may support important invertebrate communities. These features include, for example, an abundance of dead wood, the presence of diverse plant communities, the presence of varied woodland structure and sunny woodland edges with a diverse flora, presence of ponds and watercourses and the presence of free-draining soil exposures. During the Phase 1 survey there was no attempt made to identify species present and where a site supports features that may be of importance to invertebrates then further Phase 2 surveys may be required to assess the importance of the site.

2.4 **Initial Protected Species Assessment**

Details of the assessment criteria used to determine the ecological value of on-site attributes are outlined below. During the Phase 1 survey the assessment criteria are based on the potential for the site to support the species considered; this is usually based on the on-site habitat features and their suitability for the species considered (Paragraphs 2.4.1 to 2.4.2). Where a species has been confirmed as present during the Phase 1 survey then the ecological value of that species at the site is assessed. However, in many cases Phase 2 surveys will be required to assess the status of species and hence the importance of a population at the site, therefore the assessment of value should be considered a provisional assessment.

2.4.1 **Badger, Dormouse, Otter, Water Vole, Breeding Birds, Reptiles, Great Crested Newt and Terrestrial Invertebrates**

The potential for the site to support protected species is based on the results of the field survey assessment. The potential for on-site habitat to support badger, dormouse, otter, water vole, breeding birds, reptiles, great crested newt and notable or important terrestrial invertebrates is based upon the following criteria:

- **Species Present** - Species confirmed as present during the field survey, either through direct observation or by the presence of unambiguous field signs such as droppings, prints, hairs, nests, eggs etc. Further Phase 2 surveys will be required in order to assess population status.

- **High Potential** - The on-site habitat is of high quality for a given species/species group. The site is located within or adjacent to a national or regional stronghold. Good quality surrounding habitat and good connectivity. Further Phase 2 surveys will be required in order to assess population status.

- **Medium Potential** - The on-site habitat is of moderate quality, providing most or all of the known key requirements of a given species/species group. Factors limiting the potential of occurrence may include small habitat area, habitat severance and disturbance. Further Phase 2 surveys will be required in order to assess population status.

- **Low Potential** - On-site habitat is of poor to moderate quality for a given species/species group. The presence cannot be discounted on the basis of national distribution, nature of surrounding habitats, habitat fragmentation, recent on site disturbance etc. Further Phase 2 surveys likely to be required in order to assess population status.

- **Negligible Potential** - Although presence cannot be absolutely discounted, the site includes very limited or poor quality habitat for a particular species/species group. The surrounding habitat is considered unlikely to support wider populations of a species/species group. The site may also be outside or peripheral to the known national range for a species. Further Phase 2 surveys are unlikely to be required.

2.4.2 **Bats - Tree Assessment**

The trees on-site were graded for their importance to bats using the following criteria:
- **Confirmed Roost** - In some instances, bat presence can be confirmed from trees e.g. where droppings or staining is visible, where roosting bats have been observed entering/emerging from a tree or where roosting bats can be heard. Such trees will require further Phase 2 surveys to assess roost status.

- **High Potential** - High potential trees have features such as loose bark, splits and deep/extensive holes suitable for roosting bats. High potential trees are generally large and/or mature specimens. Further Phase 2 surveys will be required to assess the presence/absence of bats.

- **Medium Potential** - Medium potential trees have some interest for roosting bats such as broken snags, some flaking bark, a covering of ivy or shallow holes. Further Phase 2 surveys will be required to assess the presence/absence of bats.

- **Low Potential** - Low potential trees have some, although generally limited potential to support roosting bats. Further Phase 2 surveys are likely to be required to assess the presence/absence of bats.

- **Negligible Potential** - Negligible potential trees are those that provide few or no features with bat roosting potential. Generally these trees are immature specimens. Further Phase 2 surveys are unlikely to be required to assess the presence/absence of bats.

2.5 **Phase 1 Survey Timing and Weather Conditions**

The extended Phase 1 field survey was carried out by Frances Lowe (Natural England Bat Licence No. 20130175) of ECOSA on 3rd May 2013. The weather conditions were dry and sunny with five per cent cloud cover, a north-easterly wind at Beaufort Scale Force 1 and an ambient temperature of 16° Celsius (C).

2.6 **Phase 1 Survey Equipment**

During the Phase 1 survey the surveyor was equipped with 10x42 binoculars, a high-powered torch and a digital camera.

2.7 **Phase 1 Survey Limitations**

It is not always possible to provide definitive assessments of a species' presence/likely absence at a site and so in the absence of direct evidence assessments and recommendations are based on the presence of suitable habitat within/adjacent to a site.
3.0 Assessment Methodology

The assessment of potential ecological impacts has been undertaken in accordance with the IEEM Guidelines\(^6\).

3.1 Setting the Zones of Influence

A Zone of Influence (ZOI) for the Proposed Development was determined for each of the ecological receptors considered (habitats, communities or species). This is the area over which the activities associated with the Proposed Development could influence that receptor. The ZOI considered as part of this assessment have been determined on a receptor-specific basis and the judgement has been based on:

- The sensitivity of the receptor to any biophysical changes which could occur; and
- The characteristics of any potential effects associated with the Proposed Development, and the distance and pathways that might be associated with that effect.

Initially, the ZOI were developed on the basis of high-level, desk-based review of ecological resources in the general vicinity of the Application Site, in combination with a review of the likely change-pathway-effect associated with the Proposed Development. A larger ZOI is likely to be appropriate for bats, which are mobile and wide-ranging species. The ZOI and associated study areas were continually reviewed and (where appropriate) amended in the light of any evolution of the development proposals and the emerging findings of the studies. Table 3.1 provides the ZOI for each of the receptors.

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Zone of Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designated Sites (Statutory)</td>
<td>1km from Application Site</td>
</tr>
<tr>
<td>Designated Sites (Non-statutory)</td>
<td>50m from Application Site</td>
</tr>
<tr>
<td>Habitats</td>
<td>50m from Application Site</td>
</tr>
<tr>
<td>Badger</td>
<td>30m from Application Site</td>
</tr>
<tr>
<td>Bats (Roosting)</td>
<td>Application Site</td>
</tr>
<tr>
<td>Bats (Foraging/Commuting)</td>
<td>2km from Application Site</td>
</tr>
<tr>
<td>Breeding Birds</td>
<td>Application Site</td>
</tr>
<tr>
<td>Reptiles</td>
<td>Application Site</td>
</tr>
<tr>
<td>Water vole</td>
<td>10m from Application Site</td>
</tr>
<tr>
<td>Otter</td>
<td>50m from Application Site</td>
</tr>
</tbody>
</table>


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3.2 Valuing Ecological Resources

In accordance with the IEEM Guidelines and other relevant guidance, this assessment focuses on those activities that could potentially generate significant effects or key receptors. In order to determine the likelihood of a significant effect, it is first necessary to identify whether a receptor is sufficiently important for an effect on it to be potentially material in the decision-making process. To achieve this, the importance of receptors has been determined on the basis of a combination of factors such as rarity, conservation status and distribution, using contextual information where it exists.

The IEEM guidance follows a ‘biodiversity’ approach to impact assessment (i.e. rather than relying solely on the legal protection of a species), with other factors such as abundance and rarity considered. The assessment methodology uses a process of assigning values (sensitivity/importance) to the identified ecological features, predicting and characterising ecological effects (magnitude of effect) and, through this process, determining the likelihood and significance of potential effects on ecological receptors, both individually (i.e. species) and in combination (i.e. assemblages).

Where this information exists, population size, trends and conservation status for various species has been derived from relevant published or online sources. For some species, this information is relatively well-known whereas for others little accurate information is available. National and regional population assessments, trends and distributions for bats for example are generally poorly-known and based upon incomplete datasets.

3.3 Significance of Effects

In accordance with the IEEM Guidelines, a significant effect is one which is considered likely to affect the integrity or conservation status of the receptor. Integrity can be defined as ‘the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified’ (IEEM, 2006). The conservation status of a habitat can be defined as ‘the sum of the influences acting on the habitat and its typical species, that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographic area’, and (for individual species) ‘the sum of influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within a given geographic area’ (IEEM, 2006).
Where a significant effect is identified using the IEEM approach (i.e. where it is considered likely to affect the integrity or favourable conservation status of a receptor), the importance of the receptor determines the geographic scale at which the effect of the impact is significant. This frame of geographical reference applied is in accordance with the IEEM Guidelines. Professional judgement is used to determine the likely magnitude of change to the receptor (negligible, small, medium, high), and this, combined with the importance (high, medium, low, negligible), provides a guide to the level of significance of the effect (minor, moderate, major).

The significance of the likely effects is assessed both before and after consideration of additional mitigation measures. The latter represents the assessment of the residual effects of the Proposed Development.

Professional judgement is used on a case-by-case basis to categorise the receptors in both approaches, but a general guide to comparing the value of the receptors is derived from the IEEM Guidelines; these are set out in Table 3.2. Table 3.3 provides the significance criteria for the ecological assessment.

<table>
<thead>
<tr>
<th>Value</th>
<th>Examples</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>International</td>
<td>An internationally important site, e.g. Special Protection Area (SPA), Special Area of Conservation (SAC) or Ramsar site (or a site considered worthy of such designation); A regularly occurring population of an internationally important species (listed on Annex IV of the Habitats Directive).</td>
<td>High</td>
</tr>
<tr>
<td>National</td>
<td>A nationally designated site, e.g. SSSI, or a site considered worthy of such designation; a viable area of a habitat type listed in Annex 1 of the Habitats Directive, or smaller areas of such habitat which are essential to maintain the viability of a larger whole; Any substantial, regularly occurring population of a nationally important species, e.g. listed on Schedules 5 and 8 of the Wildlife &amp; Countryside Act (1981); A feature identified as of priority in the UK BAP.</td>
<td>High</td>
</tr>
<tr>
<td>Regional/County</td>
<td>Areas of internationally or nationally important habitats which are degraded but are considered readily restored; Viable areas of key habitat identified in Local BAPs, or smaller areas of such habitat which are essential to maintain the viability of a larger whole; A site designated as a Wildlife Site or SINC; A regularly occurring, locally significant number of a nationally important species.</td>
<td>High/Medium</td>
</tr>
<tr>
<td>Value</td>
<td>Examples</td>
<td>Importance</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>District/Borough (Peterborough)</td>
<td>Areas of habitat identified in a sub-county (district/borough) or in the relevant Natural Area profile;</td>
<td>Medium/Low</td>
</tr>
<tr>
<td></td>
<td>District sites that the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sites or features that are scarce within the district or borough or which appreciably enrich the district or borough habitat resource;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A diverse or ecologically valuable hedgerow network;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A small population of a nationally important species or a substantial population of a species of local or regional importance.</td>
<td></td>
</tr>
<tr>
<td>Local/Parish/Neighbourhood</td>
<td>Areas of internationally or nationally important habitats which are degraded and have little or no potential for restoration;</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>A good example of a common or widespread habitat or species in the local area.</td>
<td></td>
</tr>
<tr>
<td>Within the Application Site</td>
<td>Habits of importance only at the site level.</td>
<td>Low/Negligible</td>
</tr>
</tbody>
</table>

**Table 3.3 Significance criteria for ecological assessment**

<table>
<thead>
<tr>
<th>Impact Significance</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Beneficial</td>
<td>The effect is of a magnitude likely to cause a permanent beneficial effect on the integrity of an international and/or nationally important ecological receptor.</td>
</tr>
<tr>
<td>Moderate Beneficial</td>
<td>The effect is of a magnitude likely to benefit a district and/or locally valued ecological receptor.</td>
</tr>
<tr>
<td>Minor Beneficial</td>
<td>The effect is of a magnitude likely to benefit a district and/or locally valued ecological receptor, causing a permanent beneficial effect on its integrity (for ecosystems) or conservation status (for habitats or species).</td>
</tr>
<tr>
<td>Negligible</td>
<td>The effect is not of concern.</td>
</tr>
<tr>
<td>Minor Adverse</td>
<td>The effect is of a magnitude likely to affect a district and/or locally valued ecological receptor, but there will be no permanent effect on its integrity (for ecosystems) or conservation status (for habitats or species).</td>
</tr>
<tr>
<td>Moderate Adverse</td>
<td>The effect is of a magnitude likely to affect a district and/or locally valued ecological receptor.</td>
</tr>
<tr>
<td>Major Adverse</td>
<td>The effect is of a magnitude likely to cause a permanent effect on the integrity of an international and/or nationally important ecological receptor.</td>
</tr>
</tbody>
</table>
4.0 BASELINE CONDITIONS

4.1 Introduction
This section details the results of the extended Phase 1 field survey undertaken at land on the Elton Park estate, north of Eaglethorpe in Elton, Peterborough, together with the results of the desk study and previous ecological surveys undertaken for the original planning application at the site. This information is used to provide an assessment of the potential ecological impact of the works. Protected species legislation relevant to the survey findings is presented in Appendix 1.

4.2 Desk-based Assessment
A summary of the results of the desk-based assessment is outlined below. Detailed records for designated sites and protected or notable species are provided in Appendix 2.

4.2.1 Statutory Designated Sites
There are no records of statutory designated nature conservation sites located within a 1km radius of the site.

4.2.2 Non-Statutory Designated Sites
There are five non-statutory designated sites within 1km of the site, details of which are provided in Table 4.2.

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Site Status</th>
<th>Distance</th>
<th>Summary of reasons for designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eaglethorpe New Lake</td>
<td>Local Wildlife Site</td>
<td>Within site</td>
<td>A total of 8 fen, marsh and swamp indicator species qualifies the site as a Local Wildlife Site (LWS).</td>
</tr>
<tr>
<td>Elton Estate Mill</td>
<td>Potential Wildlife Site</td>
<td>65m west</td>
<td>Small meadow crossed by botanically diverse wet ditches.</td>
</tr>
<tr>
<td>Fields</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lady Margaret's Wood</td>
<td>Local Wildlife Site</td>
<td>Forms eastern boundary of site</td>
<td>A total of 9 ancient woodland indicator species qualifies the woodland as a LWS.</td>
</tr>
<tr>
<td>Warmington Big Green</td>
<td>Pocket Park</td>
<td>740m south</td>
<td>Meadow habitat with areas of bog and a pond.</td>
</tr>
<tr>
<td>Warmington Old Orchard</td>
<td>Pocket Park</td>
<td>150m southwest</td>
<td>Historic orchard site.</td>
</tr>
</tbody>
</table>

The closest non-statutory designated site to the development site is Eaglethorpe New Wood Local Wildlife site, which is located within the site and covers all of the land within the application boundary, including the new reservoir which was under construction at the time of designation of the site in 2008. This site has been designated for the presence of eight fen, marsh and swamp indicator species including Wild Angelica.
Angelica sylvestris, Meadowsweet Filipendula ulmaria, Yellow iris Iris pseudacorus, Purple-loosstrife Lythrum salicaria, Water Mint Mentha aquatica, Water Forget-me-not Myosotis scorpioides, Common Fleabane Pulicaria dysenterica and Skullcap Scutellaria galericulata.

4.2.3 Protected and Notable Species

A number of protected and notable species records were provided by the Northamptonshire Biodiversity Records Centre (NBRC) and the Northants Bat Group (NBG). Full details of these records are provided in Appendix 2, summarised below.

- There are five records of badger within 1km of the site (NBRC 2013).

- There are 17 records of bats within 1km of the site (NBG 2013). These include six records of pipistrelle Pipistrellus species, one record of soprano pipistrelle Pipistrellus pygmaeus, eight records of brown long-eared bat Plecotus auritus, one record of Natterer’s bat Myotis nattereri, and one record of whiskered bat Myotis mystacinus. It is also noted that barbastelle Barbastella barbastellus and noctule Nyctalus noctula have been recorded within the wider area.

- There is one record of water vole within 1km of the site from 1990 (NBRC2013). This record is approximately 150m west of the site.

- There are seven records of otter within 1km of the site from 2007 (NBRC 2013). These records are all for the River Nene which runs adjacent to the north-west of the site.

- There are records of 21 species of bird within 1km of the site (NBRC 2013). These include records of common sandpiper Actitis hypoleucos, skylark Alauda arvensis, common linnet Carduelis cannabina, cuckoo Cuculus canorus, peregrine Falco peregrinus, hobby Falco subbuteo, yellow wagtail Motacilla flava, golden plover Pluvialis apricaria, common redshank Tringa totanus, fieldfare Turdus pilaris and northern lapwing Vanellus vanellus.

- There is one record of great crested newt within 1km of the site from 1985 (NBRC 2013). This record is approximately 920m south of the site.

4.3 Vegetation Survey Results

The vegetation within the site is described here in general terms using Phase 1 habitat survey terminology and referring to dominant, characteristic and other noteworthy
species in each vegetation type within the survey area. The following Phase 1 habitat types are present within the site, which are described below:

- Scattered trees and plantation woodland;
- Dense, scattered and mature scrub;
- Improved grassland;
- Inundated former grassland;
- Ephemeral/short perennial vegetation;
- Dry ditch;
- Riparian pool; and
- Reservoir and earthworks.

4.3.1 Scattered Trees and Plantation Woodland
A line of immature willow Salix species (sp.) trees protrudes towards the centre of the site from the entrance along the southern boundary (Figure 1).

The south-western boundary of the site encompasses a small area of a larger plantation woodland surrounding a tributary of the River Nene (Figure 2). The woodland is more typical of a plantation in the off-site area to the west, consisting of evenly spaced poplar Populus sp.. The on-site area supports a group of mature bankside trees dominated by poplar and ash Fraxinus excelsior.

![Figure 1](left) Line of immature willow extending towards site centre from southern boundary
![Figure 2](right) Edge of plantation woodland in south-west corner of site, looking southward

The scattered trees and plantation woodland at the site are semi-natural habitats of low quality that are common and widespread throughout the UK. The species present include non-native, naturalised and/or hybrid cultivated species and are considered to be of low ecological value.

4.3.2 Dense, Scattered and Mature Scrub
An area of dense willow Salix sp. scrub is situated in the south-western part of the site alongside a tributary of the River Nene (Figure 3).
Scattered scrub in the form of occasional patches of hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa* and bramble *Rubus fruticosus* aggregate (agg.) are present throughout an area of inundated grassland habitat in the north-eastern part of the site.

Mature scrub takes up a large part of the northern area of the site, comprising willow *Salix* sp., hawthorn and poplar, upon a grass sward dominated by false oat-grass *Arrhenatherum elatius* (Figure 4).

![Figure 3 (left) Dense willow scrub in the foreground alongside the River Nene; plantation woodland can be seen in the background](image)

![Figure 4 Area of mature scrub in the northern part of the site, to right of photograph](image)

The dense willow scrub in the south-west of the site provides an ecological buffer to the River Nene tributary and enhances the variety of vegetation in the vicinity of the watercourse. The mature scrub in the northern area of the site provides good vegetative cover on an otherwise exposed site. Taken together, these areas of scrub are considered to be of moderate ecological value in the context of the site. The scattered scrub is less valuable and arises from a lack of management, being of low ecological value.

### 4.3.3 Improved Grassland

A large swath of improved grassland spans much of the north-western boundary, adjacent to the River Nene (Figure 5 and Figure 6). The grassland extends between the nature scrub in the north and the reservoir in the centre. The sward is denser and longer in the south-west, forming tussocks in some places and newly colonising the built up bank next to the reservoir. The species composition is dominated by barren brome *Bromus sterilis*, hairy brome *Bromus ramosus*, red fescue *Festuca rubra*, curled dock *Rumex crispus*, broadleaved dock *Rumex obtusifolius* and wild teasel *Dipsacus fullonum*. Abundant ground ivy *Glechoma hederacea* and locally dominant common nettle *Urtica dioica* are also present.
Improved grassland is generally species-poor and is present in abundance on both a local and national scale. The grassland does not contribute significantly to the biodiversity of the site and is therefore deemed to be of low ecological value.

### Inundated Former Grassland

This area of habitat is situated in the eastern area of the site, immediately north of the entrance (Figure 7). It appears to have been improved grassland until recently and has developed into a more complex habitat as a result of ongoing inundation by water pumps from the adjacent reservoir. The boundaries have been built up to form earth banks that are being colonised by new growth of grass and forb species (Figure 8). The resultant small and large pools of water are bordered by a range of common and widespread terrestrial and emergent plants.

Lesser pond sedge *Carex acutiformis* is dominant throughout the centre of the area, with locally dominant yellow flag iris *Iris pseudacorus*, common nettle and creeping cinquefoil *Potentilla reptans*. Curled dock, broadleaved dock, great willowherb *Epilobium hirsutum* and cleavers *Galium aparine* are present in abundance, with frequent creeping thistle *Cirsium arvense*, creeping bent *Agrostis stolonifera* and
ground ivy. Occasional willow *Salix* sp., creeping buttercup *Ranunculus repens*, wild
teasel, hawthorn, common ragwort *Senecio jacobaea*, bristly ox tongue *Picris echioides*
and blackthorn are also present, with rare bramble.

This area of inundated grassland habitat is noted in the designation for the Eagleton
New Lake Local Wildlife Site. During the survey for the Local Wildlife Site undertaken
in 2008, a total of nine fen, swamp and marsh indicator species were recorded including
Wild Angelica *Angelica sylvestris*, Meadowsweet *Filipendula ulmaria*, Yellow Iris *Iris
pseudacorus*, Purple-loosestrife *Lythrum salicaria*, Water Mint *Menapha aquatica*, Water
Forget-me-not *Myosotis scorpioides*, Common Fleabane *Pulicaria dysenterica* and
Skullcap *Scutellaria galericulata*.

While being unusual in character, the area of inundated former grassland comprises
common and ephemeral species dominated by particularly aggressive species that
indicate the site's former treatment with fertilisers. On the basis of the vegetation
present, this area is therefore considered to be of **low ecological value**.

### 4.3.5 Ephemeral/short Perennial Vegetation

Ephemeral/short perennial vegetation has colonised areas of bare earth created by
earthworks in the southern area of the site. Curled dock, broadleaved dock, creeping
thistle, wild teasel and bristly ox tongue are all present in abundance, with frequent
stands of hard rush *Juncus inflexus*. This habitat type is sparse and ephemeral,
deemed as having **low ecological value**.

### 4.3.6 Dry Ditch

A newly created dry ditch is situated north of the reservoir in the west of the site. The
ditch is evidently dry on a seasonal basis, as common reedmace *Typha latifolia* is
present. The ditch supports little vegetation and is of **low ecological value**.

### 4.3.7 Riparian Pool

A pool of approximately 0.15ha is formed by an inlet from the River Nene in the north
of the site (Figure 9). The pool is reasonably deep and surrounded by mature scrub
and improved grassland. Little emergent vegetation is present, however the feature is
deemed as having **moderate ecological value**, being part of the River Nene.
4.3.8 Reservoir and Earthworks

The main feature of the site is a large reservoir currently being created in the central and southern area (Figure 10 and Figure 11). A mineral extraction operation is ongoing, requiring a continuous stream of heavy plant to carry material from the reservoir to the plant located north-east of the site along a network of wet earth tracks.

![Figure 10 View across earthworks and the reservoir taken from the east looking south](image1)
![Figure 11 The reservoir from the north](image2)

The site and much of the habitat present is heavily disturbed as a result of the operations. No vegetation is present in these areas, which are considered to be of low ecological value.

4.4 Badger Survey Results

There are five records of badger within 1km of the site (NBRC 2013). The badger survey undertaken by SLR in 2010 identified two badger sets within the local area including one sett approximately 650m east of the site and one sett approximately 150m north of the site. No badger sets were recorded on the site during the 2013 survey, and the majority of the ground would be too wet for this purpose. The surrounding countryside will undoubtedly support resident badger, which may forage
and commute within areas of woodland to the south-west and north-east, and the improved grassland on-site regularly.

Given the suitability of the wider area and records of badger setts, the site has a **moderate potential** to support foraging and commuting badger and **low potential** to support resident badger.

4.5 Bat Survey Results

No detailed Phase 2 bat surveys were undertaken on the site for the previous planning application due to a lack of impact on trees or structures with roost potential.

4.5.1 Bats – Tree Assessment

The site contains three trees in the south-west corner with potential to support roosting bats. These are an ash (Figure 12) and two poplar (Figure 13 and Figure 14) which support features such as splits, loose bark and snags that could be used by tree-roosting bat species. The trees are considered to have **low potential** to support roosting bats.

![Figure 12 (top left) Ash in the south-west corner of the site with a split limb](image1)
![Figure 13 (bottom left) Poplar with a woodpecker hole that roosting bats could use as a roost](image2)
![Figure 14 Large poplar with a broken limb, providing gaps suitable for roosting bats](image3)
4.5.2 Foraging and Commuting Habitat
Habitats surrounding the site are ideal for use by foraging and commuting bats, being rural in character and supporting many linear landscape features such as hedge-lined country lanes and the River Nene and associated tributaries. These features link occasional parcels of semi-natural and plantation woodland. Bats are likely to forage over the waterbodies on and adjacent to the site and over the mature scrub in the northeast. The site is deemed as having moderate potential for supporting foraging and commuting bats.

4.6 Dormouse Survey Results
The site does not support any hedgerows. While there is plantation and mature and dense scrub habitat on the site, none offers the level of structure, species diversity and connectivity that would be required by dormice. The site is therefore considered to have negligible potential to support this species.

4.7 Otter
Previous surveys undertaken by RPS in 2007 found evidence of otter including spraints and footprints along the River Nene to the northwest of the boundary of the site. An additional survey undertaken by RPS in 2010 identified one probable otter spraint along the River Nene. No otter holts were identified within proximity of the works during any of the previous surveys.

The otter survey, undertaken by ECOSA in 2013, of the southern bank of the River Nene on the northern site boundary recorded no evidence of otter activity, however, otter are known to be present on the River Nene and are likely to commute and forage through this stretch of the river on a regular basis. There is no habitat along the site boundary suitable for the formation of otter holts but short term lie-ups may be used from time to time in areas of longer grass. The site is therefore considered to be of moderate potential for supporting otter.

4.8 Water Vole
During previous water vole surveys undertaken by RPS on the River Nene and wet ditches on site in 2007 and 2010, no evidence of water vole was found.

The water vole survey, undertaken by ECOSA in September 2013, of the southern bank of the River Nene recorded no evidence of water vole activity. American Mink Mustela vison are present in the Nene catchment\textsuperscript{10}, with past surveys recording water vole signs on as little as 7 per cent of stretches surveyed in the region. The southern

bank of the River Nene at the site is formed of disturbed areas of grassland and there are limited areas of longer herbaceous vegetation required by the species for foraging and cover. The channel is wide, open and exposed, unlike the well-vegetated channels preferred by this species for foraging and protection from predators (Figure 15).

Figure 15 Northern site boundary formed by the southern bank of the River Nene

The site is therefore considered to be of low potential for supporting water vole.

4.9 Bird Survey Results

A breeding bird survey undertaken by RPS in 2003 identified 27 species of bird breeding on site. These included dunnock Prunella modularis, reed bunting Emberiza schoeniclus, song thrush Turdus philomelos, mistle thrush Turdus viscivorus, stock dove Columba oenas, green woodpecker Picus viridis and great spotted woodpecker Dendrocopos major.

A winter bird survey undertaken by RPS in 2002-03 identified a total of 47 bird species on site, of which 22 are of some conservation importance. Birds listed on schedule 1 of the Wildlife and Countryside Act 1981 (as amended) included red kite Milvus milvus, peregrine and kingfisher Alcidae atthis. Birds listed as red list species on the Birds of Conservation Concern (BoCC) included song thrush, starling Sturnus vulgaris and reed bunting. The site was also found to support important numbers of wintering common snipes Gallinago gallinago and jack snipe Lymnocryptes minimus, both of which are listed as amber on the BoCC.

The aquatic, riparian and terrestrial habitats on and adjacent to the site provide opportunities in which a range of bird species can forage, commute and nest. The following bird species were recorded on or adjacent to the site during the survey: coot Fulica atra, moorhen Gallinula chloropus, mallard Anas platyrhynchos, great crested grebe Podiceps cristatus, Canada goose Branta canadensis, black-headed gull Chroicocephalus ridibundus, pheasant Phasianus colchicus, jackdaw Corvus monedula, great spotted woodpecker, woodpigeon Columba palumbus, collared dove
Streptopelia decaocto, swallow Hirundo rustica, blue tit Cyanistes caeruleus, great tit Parus major, chiffchaff Phylloscopus collybita, blackcap Sylvia atricapilla, goldfinch Carduelis carduelis, chaffinch Fringilla coelebs, dunnock Prunella modularis, robin Erithacus rubecula and wren Troglodytes troglodytes.

It is likely that many of these species and others nest within vegetation on the site, with the exception of swallow, which requires buildings or exposed rock faces for nesting. Overall, the site is considered to offer high potential for supporting nesting bird species and past surveys have confirmed the site to support a diverse range of wintering birds, including important numbers of common snipe and jack snipe.

4.10 Reptile Survey Results

Previous surveys undertaken on the site by RPS in 2003 found a maximum of four grass snake Natrix natrix on site. This equates to a low population.

The area of unmanaged improved grassland running parallel to the River Nene in the north of the site and the adjacent topsoil stockpile (Figure 16) provide habitat in which reptiles could forage, commute, bask, shelter, breed and hibernate, and are therefore considered to offer moderate potential for supporting common species of reptile.

![Image](image.png)

Figure 16 Northern site boundary as at April 2014, lined with a topsoil stockpile adjacent to the buffer area along the southern bank of the River Nene

4.11 Great Crested Newt Survey Results

No previous Phase 2 great crested newt surveys have been undertaken on the site due to a lack of suitable aquatic habitat within 500m of the site.

The aquatic habitats on the site comprise the reservoir, newly flooded areas and the riparian pool in the north of the site. The reservoir is large, exposed, free of emergent vegetation and newly created. It is therefore unsuitable for supporting great crested newt. The areas of flooding are new and considered to be ephemeral habitat that great crested newt are unlikely to have colonised since their creation. Furthermore, the
instability and disturbed nature of this habitat is likely to perturb great crested newt from settling on the site. The riparian pool in the north of the site has little emergent vegetation and is heavily occupied by wildfowl. It is fed by the River Nene, and appears to be subject to a current in some areas. This combined with the likely presence of predatory fish make the waterbody unsuitable to support great crested newt.

Ordnance survey 1:25,000 maps do not indicate that there are any other ponds located within a 500m radius of the site, making it unlikely that great crested newt would be able to colonise the site from nearby habitat. The mature scrub on the site would provide suitable terrestrial habitat for this species, however the lack of suitable aquatic habitat means that great crested newt are unlikely to occupy the site. The site is therefore deemed as having negligible potential to support great crested newt.

4.12 Terrestrial Invertebrates

No previous terrestrial invertebrate surveys have been undertaken on the site. It is possible that occasional rare or notable invertebrates would be supported by the site, due to the mixture of aquatic and terrestrial habitats available and with the River Nene forming the site’s north-western boundary. However, it is unlikely that any significant assemblages would be present. It is therefore considered that the site is likely to be of low to moderate potential to support a diverse community of invertebrates, or notable invertebrate species.

4.13 Overall Site Assessment

The vegetation present comprises a varied range of terrestrial and aquatic habitats surrounding a highly disturbed active mineral extraction site. The site has been designated as a Local Wildlife Site (Eaglethorpe New Lake) and is therefore of district importance and low/moderate value. The habitats present on site include those of low and moderate ecological value, and taken together these make the northern area of the site in particular a suitable area to support common reptiles and breeding birds. Previous surveys have confirmed the site to support a small population of grass snake and a range of breeding and wintering birds. No evidence of water vole has been found on site during previous surveys or during the 2013 survey although they are known to be present within close proximity to the site. The River Nene is known to support otters although no holts have been found during the survey in 2013 or during previous surveys. Three mature trees in the south-western corner of the site have the potential to support bats, which are likely to forage and commute within on-site habitats. It is considered unlikely that dormice or great crested newt would be supported by the site due to the lack of suitable habitat. Overall, the site is considered to be of moderate ecological value, due to the presence of suitable habitat for a number of protected species and the unusual combination of habitats present.
5.0 EVALUATION, IMPACTS AND RECOMMENDATIONS

5.1 Introduction
This section presents the conclusions of the ecological assessment at land on the Elton Park estate, north of Eagletorpe in Elton, Peterborough and provides an assessment of the likely ecological constraints to the on-going works and recommendations for any further survey work considered necessary. An outline of protected species legislation relevant to the findings of this report is provided in Appendix 1.

5.2 Designated Sites

5.2.1 Evaluation
There are five non-statutory designated sites within 1km of the site. The closest of these sites is Eagletorpe New Lake LWS which is within the site and covers the application site.

5.2.2 Potential Impacts of Proposed Development
With the exception of the Eagletorpe New Lake LWS there will be no impacts to any of the non-statutory designated sites.

As the works are located within the Eagletorpe New Lake LWS the works will have an impact on this site.

In the short-term the works will involve the extension of the current reservoir onto the northern part of the site. This will involve the removal of vegetation, some of which may include some of the indicator species for which the site is designated. It is probable that there will be a short-term moderate adverse impact on the site through direct loss of habitat.

A detailed management plan\textsuperscript{11} has been produced to satisfy one of the conditions of the original planning application. The aim of this management plan is to ensure compliance of the works with wildlife legislation during construction and to set out details of habitat creation, management and monitoring for the creation of a wetland conservation area to compensate for the loss of habitat due to the construction of the reservoir. This management plan is on-going as part of the original planning permission for the site and will be carried forward as part of the updated planning application. The management plan will create new diverse wetland habitats which should increase the diversity of botanical species on site, compensating for any loss of habitat during the

\textsuperscript{11} RPS (2006) Elton Estate Management Plan

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construction of the new reservoir. The new reservoir and wetland conservation area will also be of value for breeding and wintering birds. The management plan also includes a strategy for the removal of non-native and invasive species including New Zealand pigmyweed *Crasula helmslii* which if left unmanaged has the potential to colonise further areas of the site and have an adverse impact on the Local Wildlife Site.

In the long-term, following implementation of the management plan, it is probable that the works will have a minor-moderate beneficial impact on the Eagletorpe New Lake Local Wildlife Site. This benefit will be achieved through the creation of new wetland areas with a diverse mix of aquatic, emergent and marginal vegetation, which will increase the botanical diversity of the site. The new wetland conservation area will be designed to benefit waders and other water birds but will also be of value to a range of species including otter, water vole, bats, grass snake and invertebrates.

### 5.2.3 Recommendations

The on-going management plan which is being implemented as part of the previous planning permission will ensure the long-term beneficial impact of the scheme and will ensure that any short term adverse impacts are minimised.

### 5.3 Vegetation

#### 5.3.1 Evaluation

The site contains a range of habitats of local value and low ecological value. These include areas of mature scrub and unmanaged improved grassland present adjacent to the River Nene. All of the vegetative habitats on the site are formed of common and widespread floral species.

#### 5.3.2 Potential Impacts of Proposed Development

The construction of the new reservoir will result in the loss of areas of the inundated grassland habitat which was previously wooded. The proposals will see the retention of boundary vegetation. No mature trees will be removed. The loss of these ephemeral habitats of low ecological value will have a short-term slight adverse impact.

The Reservoir Management Plan outlined above (Paragraph 5.2.2) provides details on how the site will be managed in the long-term, including the creation of new wetland habitats on the site. This will create new diverse habitats which will be more botanically diverse than the current habitats on site, resulting in a long-term beneficial impact on vegetation. The management plan also provides details on the management of New Zealand pigmyweed and other non-native species. The reduction of these non-native species will also have a long-term beneficial impact on the vegetation at the site.
Other potential impacts associated with the continued mineral extraction works may include soil compaction, plant movements, noise, vibration and dust. The movement of material may impact upon adjacent, retained habitats. The site is unlikely to see a significant increase in the level of human activity and associated impacts.

5.3.3 Recommendations

The retained boundary habitats should be protected by a fenced buffer zone extending 5m into the site from the River Nene. This protective measure will also serve to retain much of the set-aside grassland.

Loss of mature scrub from the north of the site should be minimised as much as possible. As part of the current management plan, landscaping plans include the planting of an area of native wetland scrub south-east of the reservoir, comprising approximately 1,400 whips of alder Alnus glutinosa, white willow Salix alba, hawthorn, dogwood Cornus sanguinea, hazel and guelder rose Viburnum opulus. The use of native shrubs will contribute significantly to the overall biodiversity of a site.

Bankside habitat and the areas surrounding the reservoir will be planted with British Seed Houses RE3 river floodplain / water meadow (MG8 grassland) mix, and reedbeds will be created at the edges of the reservoir.

Taken together, the landscaping proposals will mitigate the loss of habitat and disturbance to the site, and are likely to cause an increase in biodiversity and an associated beneficial impact overall.

5.4 Badger

5.4.1 Evaluation

No evidence of badger was identified during the 2013 survey. Previous surveys and records confirm that there are a number of badger setts in the wider areas. The site is largely unsuitable to support resident badger but is likely to support foraging and commuting badger on a regular basis.

5.4.2 Potential Impacts of Proposed Development

There are no direct impacts anticipated to badgers, as no setts were present at the time of the survey. There is a potential for a short-term slight adverse impact on badgers through a decrease in badger foraging habitat overall, although it should be noted that no evidence of foraging activity has been identified on site during previous surveys.

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the long-term, higher quality habitats will be created on-site as part of the on-going management plan which will result in a long-term neutral impact on badgers.

5.4.3 Recommendations

There are no recommendations specific to badger, however those outlined above (Paragraph 5.3.3) will increase the quality of on-site foraging habitat for this species.

5.5 Bats

5.5.1 Evaluation

The Phase 1 bat assessment of the trees on the site revealed that two poplar and one ash in the south-west corner have low potential to support roosting bats. The site is suitable for foraging and commuting bats.

5.5.2 Potential Impacts of Proposed Development

As the trees with potential to support bats are to be retained within landscaping proposals, there is not anticipated to be any impact on roosting bats at the site, and Phase 2 surveys are not considered necessary for this species group.

There will be a short-term slight adverse impact on the local bat population due to a small reduction in available foraging habitat during the construction of the new reservoir. Due to the availability of suitable foraging habitat in the wider area including the riparian habitat along the River Nene and areas of broadleaved woodland, the short-term loss of onsite habitat will not have a significant impact on the local bat population.

In the long-term, any habitats lost will be replaced through the creation of new wetland habitats around the perimeter of the site and within the new conservation area as detailed in the reservoir management plan. The combination of new aquatic and wetland habitats will provide good quality foraging habitat likely to support a diverse range of invertebrate prey. This will result in a long-term slight beneficial impact on bats.

Potential short term indirect impacts on bats include noise disturbance resulting from the extraction operations, although the majority of work will take place during daylight hours when bats are not active, and this impact is considered to be insignificant.

There will be no increase in lighting, human presence, noise or disturbance in the long-term.
5.5.3 **Recommendations**

The management plan which was put in place for the original planning permission, as outlined above (Paragraph 5.2.2), will increase the botanical and invertebrate diversity of the site, improving its capacity to provide a foraging resource for bats in the local area. This positive impact will offset any temporary disturbance impacts and result in a long term beneficial impact on bats.

5.6 **Dormouse**

5.6.1 **Evaluation**

The site contains no habitat that is considered to be of suitable structure, diversity or connectivity to support dormice.

5.6.2 **Potential Impacts of Proposed Development**

As dormice are unlikely to be present, it is not anticipated that the proposals will have an impact upon this species or its habitat.

5.6.3 **Recommendations**

No specific recommendations are considered necessary in respect of dormice.

5.7 **Otter**

5.7.1 **Summary Evaluation**

There was no evidence of otter activity recorded during the field survey, however otter are known to be present in the wider catchment of the River Nene and previous surveys have identified evidence of otters on the section of the River Nene immediately to the north of the site. There is moderate potential for this species to use the river adjacent to the site for commuting and foraging in a regular basis. No otter holts have been identified and there is no habitat deemed suitable for construction of a holt within proximity of the site, although otter may form lie-up sites along the bank in areas of longer vegetation.

5.7.2 **Impacts of Proposed Development**

The only direct impact on the River Nene will be the construction of a reservoir feeder channel which will link the new reservoir and the River Nene. Due to a lack of potential otter holt sites along this section of the river, these works will not result in the disturbance of any holts. Construction activities within proximity of the river have potential to have an adverse impact on the water quality through siltation and increased risk of pollution. Any adverse impacts on water quality are likely to have an adverse
impact on the river and any species associated with the river, including otter. All construction works within 10m of the river will be undertaken in accordance with the Environment Agency Pollution Prevention Guidelines to minimise the risk of pollution and siltation of the River Nene. Construction activities have the potential to cause disturbance through noise and visual disturbance which has potential to have an adverse impact on foraging and commuting otters. However, works will be undertaken during daylight hours when otters are less likely to be active, and there will be no disturbance at night when otters are most active. The construction activities are anticipated to have a short term slight adverse impact on the local otter population.

In the long-term, the creation of the new wetland conservation area and the new reservoir are likely to provide potential foraging and lying up habitat for otters, resulting in a long-term neutral to beneficial impact on the local otter population.

5.7.3 Recommendations

The fenced buffer zone outlined in 5.3.3, which will extend 5m into the site from the retained habitat will minimise any short term disturbance to otters. The long term management plan will create new aquatic and wetland habitats which will benefit the local otter population.

5.8 Water Vole

5.8.1 Summary Evaluation

Previous surveys undertaken by RPS in 2007 and 2010 found no evidence of water vole on site. No evidence of water vole activity recorded from the southern bank of the River Nene along the northern site boundary during the ECOSA survey in 2013. The river channel is open and exposed and provides limited areas of suitable shelter for this species. The water levels appear to fluctuate and the site is prone to flooding making it less suitable for water vole. The potential for water vole to be present at the site is considered to be low. Previous surveys on the site have found no evidence of water vole on site. There is one record of water vole 150m to the west of the site. Water vole distribution is poor throughout the wider catchment.

5.8.2 Impacts of Proposed Development

As the southern bank of the River Nene has only low potential to support water vole, it is considered unlikely that there will be a significant impact on this species. The reservoir feeder channel that will link the reservoir to the River Nene will require some excavations on the banks of the River Nene. If water vole burrows are present within proximity of the feeder channel there is potential for a direct impact on water vole through damage of burrows. The feeder channel will be 4m wide and will therefore
only impact on a small section of the river bank. Due to the small area of bank impacted and the low potential of the river to support water vole, the potential for an adverse impact on water voles is very low. If water voles are present there is a potential for a short term slight adverse impact on the local water vole population through direct impact on habitat.

In the long-term the new feeder channel will be vegetated with native species and has potential to provide additional water vole habitat. The long term management plan will create new aquatic and wetland habitats around the new reservoir which will provide additional suitable water vole habitat, with potential for the reservoir to be colonised by water voles, if they are present in the River Nene. Due to the increase in suitable aquatic and marginal habitat it is probable that the works will have a long term minor beneficial impact.

5.8.3 Recommendations

Whilst no evidence of water vole has been found during previous surveys, there is a low potential that they could colonise the banks of the River Nene in the future. Prior to the excavation of the reservoir feeder channel, the area of bank that will be impacted will be surveyed to ensure that there are no water vole burrows present within 5m of the channel. In the unlikely event that water vole burrows are identified, where possible the feeder channel location will be adjusted to avoid any direct impact on any burrows. If this is not possible, due to the small area of bank impacted, water voles will be persuaded out of the working area through habitat manipulation. This will involve the complete removal of vegetation from the banks by using a metal bladed strimmer under close ecological supervision to temporarily remove the suitable habitat and encourage the water voles out of the working area and within 5m of the working area. Following strimming, the site should be monitored for a minimum of three days to ensure that water voles have dispersed out of the small area impacted by the works. An ecologist should undertake a destructive search of the excavation of the feeder channel link onto the River Nene. The long term management plan will create new aquatic and wetland habitats along the feeder channel and new reservoir and will create additional potential water vole habitat.

5.9 Breeding Birds

5.9.1 Evaluation

The site contains various scrub habitats that offer excellent nesting opportunities for a range of bird species including wildfowl. A high level of bird activity was observed on the site during the survey. Previous breeding bird and winter bird surveys undertaken by RPS have identified 27 birds breeding on site and 47 overwintering on site.
Schedule 1 bird species were found to be breeding on site. The main interest of the site was the overwintering population of common snipe and jack snipe.

All breeding birds, their nests, eggs and young are protected by the Wildlife and Countryside Act 1981 (as amended). See Appendix 1 for further information regarding the legal and conservation status of birds in the UK.

5.9.2 Potential Impacts of Proposed Development

Boundary vegetation will be retained under the proposals, however there will be loss of an area of mature scrub habitat in the north of the site prior to creation of a new area of scrub post-extraction. Any clearance works involving scrub could impact breeding birds if undertaken during the breeding season, which extends from March to August, inclusive. If nesting birds are present, the proposed works would result in a net loss of potential nesting habitat and may result in disturbance or harm to nesting birds, their eggs or young.

In the short term, the works are likely to have a slight adverse impact on the local breeding and overwintering bird population through disturbance and temporary habitat destruction. The excavation of the reservoir is being undertaken on a campaign basis entailing working in short concentrated periods lasting 3-4 weeks after which the material is stockpiled and then processed. This will impact on a small section of the site for short periods of time reducing the disturbance of breeding and overwintering birds. In the long-term, the creation of the new reservoir and wetland areas will be of benefit to the local overwintering bird population resulting in a slight beneficial impact on the local bird population.

4.9.3 Recommendations

In order to avoid any potential impacts to nesting bird species, it is recommended that any clearance works involving scrub are undertaken outside of the main nesting season of March to August, inclusive. Should such works be necessary within this period it is recommended that habitat is first inspected by a suitably qualified ecologist to identify any active nesting sites. If an active nest is identified, no works should take place in the vicinity until nesting activity has been concluded.

The long-term management plan for the reservoir has been developed to maintain and enhance the suitability of the site for overwintering birds including common snipe and jack snipe. This includes the creation of shallows with stepped levels, varying from 15cm to 2m depth, with gradual slopes of a maximum of 1 in 5 between levels. The surrounding land will be made into marshy grassland at the height of the inter water level with some humps to provide islands and varied water levels during flooding.
5.10 Reptiles

5.10.1 Evaluation

Suitable reptile habitat is present on the site in the form of a large swathe of unmanaged improved grassland situated between the reservoir and the River Nene, along the site’s northern boundary. This area is unaffected by the scheme, however a topsoil stockpile alongside this corridor provides further suitable reptile habitat. Approximately 2.2ha of suitable reptile habitat is present in this area. Previous surveys by RPS identified a small population of grass snake within the development footprint.

5.10.2 Potential Impacts of Proposed Development

The proposals will not see the damage and/or disturbance of the area of improved grassland in the north of the site alongside the River Nene. However, it will be necessary to remove the topsoil stockpile from alongside this area at a later date. As the stockpile has potential to support reptiles, unmitigated the clearance of the site could result in the killing and injuring of reptiles which would have a minor adverse impact on the local reptile population. The higher quality suitable reptile habitat along the boundary with the River Nene will remain undisturbed.

In the long term, the creation of new marshy grassland and wetland areas will provide new areas of habitat suitable for grass snake. Sufficient suitable reptile habitat will be maintained around the site will ensure that the population of reptiles will be retained on site until the new habitat is created under the management plan. Following the creation of new habitat, it is probable that there will be a neutral to slight beneficial impact on the local reptile population due to an increase in suitable reptile habitat in the long-term.

5.10.3 Recommendations

As a low population of grass snake was identified on the site in 2003, it is probable that a population of grass snakes is still present on site and that reptiles could have colonised the topsoil stockpile alongside this corridor. It is therefore recommended that a small-scale translocation exercise is conducted in order to remove the low number of reptiles likely to be present from the stockpile. The exercise will include the installation of reptile exclusion fencing around the stockpile. Approximately 200 refugia consisting of bituminous felt cut into 0.5x0.5m tiles will be deployed in areas of suitable habitat. The site should then be visited on a minimum of 10 separate occasions in suitable weather conditions to capture and remove any sheltering and basking reptiles. If reptiles are found on the tenth visit, the site will be visited again the next day and so on, until a day with no captures is achieved. Any reptiles found will be placed outside the fenced area into retained habitat along the River Nene. A destructive search will be...
conducted under ecological supervision to capture any remaining reptiles. The
stockpile can then be removed.

The creation of new marshy grassland around the perimeter of the reservoir as
detailed in the management plan will create new suitable reptile habitat, especially for
grass snake (the only species of reptile found on site during previous surveys).

In England, all common species of reptile are fully protected under the Wildlife and
Countryside Act 1981 through inclusion in Schedule 5. Refer to Appendix 1 for further
details.

5.11 Great Crested Newt

5.11.1 Evaluation

There are no waterbodies on the site with suitability to support breeding great crested
newt; the aquatic habitats present are unstable, consisting of a riparian pool and
artificially flooded areas, along with the large reservoir in the centre of the site. There
are no other suitable waterbodies within a 500m radius and it is therefore considered
extremely unlikely that great crested newt would occupy the site.

5.11.2 Potential Impacts of Proposed Development

As it is considered extremely unlikely that great crested newt are present on the site,
there is not anticipated to be any impact on this species arising from the mineral
extraction or associated works.

5.11.3 Recommendations

As great crested newt are unlikely to be present, there is no recommendation further
survey. The measures detailed above (Paragraph 4.3.3) will improve the quality of the
terrestrial habitats present; however suitable breeding habitat in the area would be
required before the site is likely to be utilised by great crested newt.

5.12 Terrestrial Invertebrates

5.12.1 Summary

The site contains a diverse range of aquatic and terrestrial habitats that have the
potential to support some rare or notable species of invertebrate.
5.12.2 Potential Impacts of Proposed Development

It is considered that any minor impact on invertebrates caused by the loss of mature scrub at the site will be offset by the habitat enhancement works proposed within the landscaping scheme for the reservoir. It is probable that there will be a short term slight adverse impact on the local invertebrate population through the direct loss of habitat. In the long term, the creation of new wetland habitats is likely to have a slight beneficial impact on the local invertebrate population. The new wetland habitats are likely to result in an increased diversity and abundance of invertebrates.

5.12.3 Recommendations

Phase 2 surveys for invertebrates are not considered to be necessary, given that the reservoir creation works are well under way. The existing management plan and landscaping proposals will create new wetland habitats and will adequately offset any impacts associated with the works.

5.13 Updating Survey

If the work is still underway by May 2015, it is recommended that the extended Phase 1 ecological assessment is updated, as the ecology of the site is likely to have changed during this period.
6.0 Summary of Residual Impacts

6.1 Construction Impacts

Impacts during the extraction of material to create the new reservoir will include the direct loss of habitat through vegetation removal and excavation. With the implementation of mitigation outlined above, this loss of habitat is likely to have a short-term slight adverse impact on foraging bats, breeding and overwintering birds, otters, water voles, common reptiles and invertebrates. No significant impacts are likely and the construction of the reservoir is not anticipated to have an adverse impact on the local conservation status of any of the species affected. The site itself is designated as a Local Wildlife Site and there will be a short term slight adverse impact on the designated site through the removal of habitat during the construction of the reservoir. Overall, it is probable that the works will have a short term slight adverse impact on ecology.

6.2 Operational Impacts

A detailed environmental management plan is currently in place for the new reservoir. This management plan will continue to be implemented as part of the updated planning application. Under the management plan, a significant area of the site will be managed for ecology. The southern third of the reservoir will include shallow water at varying levels with gentle slope profiles. The margins of the reservoir will be planted with a range of native species and new native marshy grassland will be created around the perimeter of the new reservoir. In the long-term, following the establishment of these habitats, it is likely that there will be a long term slight beneficial impact on ecology.
Appendix 1  Protected Species Legislation

European Protected Animals\textsuperscript{12} - Otter

In England, otter are fully protected under the Wildlife and Countryside Act 1981 through inclusion in Schedule 5. In addition, otter is protected under the Conservation of Habitats and Species Regulations 2010. Taken together, these legislative instruments make it illegal to carry out the following activities:

- Deliberately or recklessly capture or kill any wild animal of a European protected species;
- Deliberately or recklessly disturb any such animal;
- Deliberately or recklessly take or destroy eggs of any such wild animal;
- Damage or destroy a breeding site or resting place of such a wild animal; and
- Keep, transport, sell or exchange, or offer for sale or exchange, any live or dead wild animal of a European protected species, or any part of, or anything derived from such a wild animal.

Any activity that would result in a contravention of the above legislation would require a licence to avoid committing an offence. Natural England has powers to grant a licence for the following purposes:

- Preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment; or
- Preventing the spread of disease; or
- Preventing serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber or any other form of property or to fisheries.

The Conservation of Habitats and Species Regulations contain three "derogation tests" which must be applied by Natural England when deciding whether to grant a licence to a person carrying out an activity which would harm an European protected species. For development

\textsuperscript{12} Summarised from www.defra.gov.uk
activities this licence is obtained after Planning Permission has been obtained. The three tests are that:

- The activity to be licensed must be for imperative reasons of overriding public interest or for public health and safety;
- There must be no satisfactory alternative; and
- Favourable conservation status of the species must be maintained.

A recent court judgment\(^{15}\) makes it clear that, notwithstanding the licensing regime, the Local Planning Authority must also address its mind to these three tests when deciding whether to grant planning permission for a development which could harm a European protected species. A Local Planning Authority failing to do so would be in breach of Regulation 3(4) of the Conservation (Natural Habitats, &c.) Regulations 1994 (revised in 2010 to become the Conservation of Habitats and Species Regulations) which requires all public bodies to have regard to the requirements of the Habitats Directive in the exercise of their functions.

In order to determine whether an activity requires a licence, Natural England advises that the guidance of a consultant ecologist is sought. However, Natural England offer the following advice as a guide:

- A licence is needed if the consultant ecologist, on the basis of survey information and specialist knowledge of the species concerned, considers that on balance the proposed activity is reasonably likely to result in an offence under Regulation 41\(^{14}\) of the Conservation of Habitats and Species Regulations; or

\(^{15}\) Judgment handed down by His Honour Judge Walksman QC sitting as a Judge of the High Court at the start of June 2009 in the case of R (on the application of Simon Woolley) v Cheshire East Borough Council. The judgment clarified for the first time the legal duty of a Local Planning Authority when determining a planning application for a development which may have an impact on European Protected Species ("EPS"), such as bats, great crested newts, dormice or others.

\(^{14}\) Regulation 41 of the Conservation of Habitats and Species Regulations 2010 states:

41. (1) A person who:
   (a) deliberately captures, injures or kills any wild animal of a European protected species,
   (b) deliberately disturbs wild animals of any such species,
   (c) deliberately takes or destroys the eggs of such an animal, or
   (d) damages or destroys a breeding site or resting place of such an animal, is guilty of an offence.

   (2) For the purposes of paragraph (1)(b), disturbance of animals includes in particular any disturbance which is likely:
      (a) to impair their ability—
If the consultant ecologist, on the basis of survey information and specialist knowledge of the species concerned, considers that on balance the proposed activity is reasonably unlikely to result in an offence under Regulation 41 of the Conservation of Habitats and Species Regulations then no licence is required. However, in these circumstances Natural England would urge that reasonable precautions be taken to minimise the effect on European protected species should they be found during the course of the activity. If they are found then work should cease and an application be made to the Wildlife Licensing Unit at Natural England, Bristol.

**Water Vole**

In England, water voles are fully protected under the Wildlife and Countryside Act 1981 through inclusion under Schedule 5.

These legislative instruments make it illegal to carry out the following activities:

- Intentional kill, injure or take a water vole from the wild;
- Possess or control (live or dead animal, part or derivative);
- Damage, destroy or obstruct access to any structure or place used by water vole for shelter or protection;
- Disturb a water vole occupying such a structure or place;
- Sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative); and
- Advertise for buying or selling such things.

**Wild Birds**

The Wildlife & Countryside Act 1981 (as amended) is domestic legislation for Great Britain that repeals existing wildlife legislation such as:

- Protection of Birds Acts 1954 to 1967; and

(1) to survive, to breed or reproduce, or to rear or nurture their young, or
(2) in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
(3) It is an offence for any person:
   (a) to be in possession of, or to control,
   (b) to transport,
   (c) to sell or exchange, or
   (d) to offer for sale or exchange.

**www.naturenst.net**
The Act covers the provisions made in these previous acts and provides additional provision for species and countryside protection. The Act is the primary legislation in Great Britain for the protection of flora, fauna and the countryside. The Act includes the UK’s domestic implementation of the species protection of the European Directive on the Conservation of Wild Birds (79/409).

Under the Wildlife and Countryside Act 1981 all birds, their nests and eggs are protected by law and it is thus an offence, with certain exceptions to intentionally:

- Kill, injure or take any wild bird.
- Take, damage or destroy the nest of any wild bird while it is in use or being built.
- Take or destroy the egg of any wild bird.
- Have in one's possession or control any wild bird (dead or alive) or any part of a wild bird which has been taken in contravention of the Act or the Protection of Birds Act 1954.
- Have in one's possession or control any egg or part of an egg which has been taken in contravention to the Act. This includes items taken or killed before the passing of the Act.
- Have in one's possession or control any live bird of prey of any species in the world (with the exception of vultures and condors) unless it is registered and ringed in accordance with the Secretary of State’s regulations.
- Have in one's possession or control any bird of a species occurring on Schedule 4 of the Act unless registered (and in some cases ringed) in accordance with the Secretary of State’s regulations.
- Disturb any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

**Status of Wild Birds**

The leading governmental and non-governmental conservation organisations in the UK have reviewed the population status of the birds that are regularly found in the UK. A total of 247 regularly breeding or wintering species were assessed and each placed onto one of three lists - Red, Amber or Green. Forty species are Red-listed, 121 are Amber-listed and 86 are Green-listed. Seven quantitative criteria were used to assess the population status of each species and place it onto the Red, Amber or Green List. These criteria are listed below. The review excluded species that are not native to the UK and those that occur irregularly as vagrants or scarce migrants.

*Global Conservation Status* - Species assessed as Globally Threatened using IUCN11 criteria were placed on the Red List.
Recent Decline - Species whose breeding or non-breeding population declined, or range contracted, rapidly (by more than 50%) or moderately (by between 25 and 49%) over the last 25 years were placed on the Red and Amber Lists respectively.

Historical Decline - Species whose populations declined severely between 1800 and 1995 were placed on the Red List, except for those that have recovered substantially (more than doubled) in the last 25 years, which were Amber Listed. In earlier assessments, all species showing a serious historical decline were Red Listed, but in this assessment the success of recent conservation action has been recognised by moving recovering species to the Amber List.

European Conservation Status - Species whose population status is unfavourable in Europe (but which are not Globally Threatened) were placed on the Amber List.

Rare Breeders - Species with a mean population size of 1-300 pairs breeding annually over the last five years were placed on the Amber List. If a full census was carried out in a single year, the result of this was used instead of a five-year mean.

Localised Species - Species for which 50% or more of the breeding or non-breeding population occurs at 10 or few sites were placed on the Amber List. This criterion was used because a species whose population is confined to a few sites faces a greater threat from chance events than one whose population is widespread. The sites considered were either Important Bird Areas (identified by BirdLife International) or Special Protection Areas (designated under the European Union’s Directive on the Conservation of Wild Birds).

International Importance - Species with 20% or more of their European population breeding in the UK were placed on the Amber List, as were non-breeding wildfowl with 20% or more of their northwest European population occurring in the UK and non-breeding waders with 20% or more of their East Atlantic Flyway population occurring in the UK. This criterion is different from the others as it is a measure of the UK’s responsibility for each species rather than the extent to which species are threatened.

- Red List species are those that are Globally Threatened according to IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and not shown a substantial recent recovery.

- Amber List species are those with an unfavourable conservation status in Europe, those whose population or range has declined moderately in recent years; those whose population has declined historically but made a substantial recent recovery; rare breeders; and those with internationally important or localised populations.
Species that fulfil none of the criteria are Green-listed.

Common Reptiles
All common reptile species (grass snakes, adders, common lizards and slow worms) native to Britain are protected by the Wildlife & Countryside Act, 1981 (as amended). This legislation makes it illegal to intentionally kill or injure a common reptile. As a result, reptiles must be removed from areas of development and relocated onto suitable release sites before any site works can commence.
APPENDIX 3
Noise Monitoring Scheme
R.J.D. Limited

Minerals Extraction and Processing Associated with the Construction of an Agricultural Reservoir at the Elton Estate

Protocol for Periodic Noise Monitoring
March 2006

Preamble

Condition 6 of the Planning Consent for the proposed sand and gravel extraction, processing and formation of an agricultural reservoir, requires scheme for noise monitoring to be prepared with monitoring carried out periodically to demonstrate compliance with the limits identified in the ANV report dated November 2005.

The noise monitoring locations are identified in Figure 1 with the relevant noise limits to which the report and Condition 6 refer presented below:

<table>
<thead>
<tr>
<th>Location</th>
<th>Daytime Freefield Noise Limit dB L_{Aeq, 1 hour}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watermill</td>
<td>55</td>
</tr>
<tr>
<td>Lady Margaret Cottages</td>
<td>55</td>
</tr>
</tbody>
</table>

Additionally, the report recommended a limit of 70 dB L_{Aeq, 1 hour} for a period of 8 weeks within any 12 month period to allow for temporary operations to be carried out (e.g. the formation of bunds).

Noise Monitoring

Noise monitoring will be carried out on the following occasions:

- During the initial soil stripping and formation of bunds for each phase;
- At the commencement of minerals extraction and processing;
- Monitoring on one occasion during extraction within each phase at times to be agreed with the Minerals Planning Authority; and
- Following complaints or comments from local residents (measurements would be carried out within 3 working days of the complaint being received).

Noise monitoring will be carried out at the two locations identified above.

During each monitoring visit, four measurements will be made at each position over periods of 15 minutes during normal working hours. The measurements shall be made at a freefield position at a height of 1.2 - 1.5 metres above ground level using a Sound Level Meter to a minimum Class 2 specification, which would be calibrated before and after each exercise.
For each measurement, the following parameters shall be recorded:

- measurement position;
- $L_{Aeq}$ and $L_{Amax,F}$ noise levels;
- weather conditions and average wind speed;
- activities being carried out on site; and
- other influences on noise levels.

Where the measurements are clearly influenced by noise from other sources (e.g., road traffic), either the extraneous noise should be paused out of the measurement or a further measurement made during a period when the site is stood, to provide a comparison with and without the site operational.

Where the measurements indicate that the noise limits have been exceeded from site operations, the source of the noise should be identified and the operator should seek to minimise noise from that source, using Best Practicable Means, to reduce noise levels below the planning condition limits. The mitigation, which could include reduction at source or by additional bunding for example, should be agreed in writing with the Minerals Planning Authority and implemented within 14 days of the monitoring exercise. Following completion of the works, the measurement exercise would be repeated to ensure that the limits are achieved and further works carried out if required.

Where it is not possible to directly measure noise from site operations, e.g., where noise levels are low, measurements of the items of plant operating on site would be taken and the calculation procedure described in BS 5228 used to calculate the site noise levels at the property.

Records of each noise monitoring exercise shall be held on site for inspection by the Minerals Planning Authority, with a copy supplied to the Minerals Planning Authority on request.
**WETLAND MIX**

- **Alder** (*Alnus glutinosa*) 30% 420 plants
- **Willow** (*Salix alba*) 30% 420 plants
- **Hawthorn** (*Crataegus monogyna*) 15% 210 plants
- **Dogwood** (*Cornus sanguinea*) 10% 140 plants
- **Hazel** (*Corylus avellana*) 10% 140 plants
- **Guelder Rose** (*Viburnum opulus*) 5% 70 plants

In groups of 5-10 plants at 1.5m spacing, with individual spiral guards.

All plants will be whips in size, and of local provenance.