

# The Keadby 3 Low Carbon Gas Power Station Project

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**The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order**

**Land at and in the vicinity of the Keadby Power Station site, Trentside, Keadby, North Lincolnshire**

## Environmental Statement Volume II - Appendix 11F: Riparian Mammal Survey Report

**The Planning Act 2008**

**The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017**

**Applicant: Keadby Generation Limited**

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## GLOSSARY

<b>Abbreviation</b>	<b>Description</b>
CIEEM	Chartered Institute of Ecology and Environmental Management
Defra	Department for Environment, Food and Rural Affairs
EclA	Ecological Impact Assessment
EPS	European Protected Species
EPSML	European Protected Species Mitigation Licence
PEA	Preliminary Ecological Appraisal

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## 1.0 INTRODUCTION

### 1.1 Background

- 1.1.1 This report accompanies **Chapter 11: Biodiversity and Nature Conservation** (ES Volume I - **Application Document Ref. 6.2**) and describes the approach and findings of the riparian mammal surveys undertaken in support of the Ecological Impact Assessment (EclA) of the Proposed Development. For the purposes of this report, riparian mammals are defined as water vole (*Arvicola amphibius*) and otter (*Lutra lutra*).
- 1.1.2 The terms of reference used to describe the Proposed Development in this report are broadly consistent with those defined within the main chapters of the Environmental Statement (ES) (ES Volume I – **Application Document Ref. 6.2**).
- 1.1.3 The Proposed Development Site encompasses an area of approximately 69.4 hectares (ha) which includes circa 20.7ha of land for construction laydown.
- 1.1.4 The Proposed PCC Site comprises an area of approximately 18.7ha of the Proposed Development Site within the wider Keadby Power Station site that is located within Keadby Common. Overhead electricity transmission lines associated with the existing National Grid 400kV Substation bisect the Proposed PCC Site. Land to the south of these overhead lines within the Proposed PCC Site is proposed for administration/ control room/ warehouse buildings and car parking areas and an above ground installation (AGI) for the gas connection. The area of the Proposed PCC Site on which the power generation (CCGT), carbon capture and compression (CCP) and associated stacks will be developed is referred to as the ‘Main Site’ herein.

### 1.2 Survey Scope

- 1.2.1 An initial Preliminary Ecological Appraisal (PEA) of the ecological constraints and opportunities associated with the Proposed Development Site was made by AECOM in March 2020, including identification of the requirements for further protected species survey. The findings of the habitat and scoping survey were compiled as a Preliminary Ecological Appraisal (PEA) report (submitted as **Appendix 11C** (ES Volume II - **Application Document Ref. 6.3**)), which should be referred to for a more detailed overview of the site conditions and habitats present.
- 1.2.2 This habitat information was used to identify locations within the potential zone of influence of the Proposed Development that supported conditions potentially suitable for riparian mammals. Accordingly, the PEA report identified 16 waterbodies (locations shown on **Figure 11F.1** (ES Volume II - **Application Document Ref. 6.3**)) requiring further survey and/ or assessment due to the potential for these waterbodies to experience impacts and effects from

construction, operation and/or decommissioning of the Proposed Development. The waterbodies of potential relevance are:

- five field drains (Drains 1 (Glew Drain), 2, 3, 4 and 5) in association with the Main Site, where construction works for the Proposed Development would be focused;
- the Stainforth and Keadby Canal due to it being considered as the preferred Canal Water Abstraction Option;
- the River Trent in the vicinity of the River Water Abstraction Option and Water Discharge Corridor;
- the North Soak Drain as it is located within the Proposed Development Site. While this waterbody would not be directly affected, it is located adjacent to a potential construction access route to the Potential Water Abstraction Option on the Stainforth and Keadby Canal;
- Hatfield Waste Drain as it is proposed that the existing Mabey Bridge would be replaced at the proposed access point off the A18;
- Keadby Common Drain adjacent to Chapel Lane, where a potential connection to the 132kV Northern Powergrid substation may involve an electrical cable being installed across the drain using open cut methods; and
- six field drains (Drains 7a-7c and 8-10) dividing arable fields at Pilfrey Farm that will be used for temporary construction.

1.2.3 The other waterbodies associated with the Proposed Development Site, all of which are minor ditches and drains, were scoped out as they will not be affected and are located at distance from proposed construction works. These other waterbodies are not considered further in this report.

1.2.4 The purpose of the riparian mammal surveys and this report is to:

- provide data on the level, nature and location of water vole and otter activity associated with the relevant waterbodies and adjacent land;
- present the above data in a manner that allows the results to be used to support an assessment of relative nature conservation value, including review against relevant criteria (see Section 2 of this report); and
- inform the options for impact avoidance, mitigation and/or compensation to be considered during design of the Proposed Development.

1.2.5 The purpose of this report is to provide baseline technical information only. It does not seek to include recommendations, specify mitigation, or make an ecological impact assessment (EclA) of the Proposed Development. The formal EclA is provided as **Chapter 11: Biodiversity and Nature Conservation (ES Volume I – Application Document Ref. 6.2)**, and this riparian mammal report comprises an appendix to that chapter.

## 2.0 METHODS

### 2.1 Desk Study

2.1.1 A desk study was undertaken as part of the PEA (included as **Appendix 11C** (ES Volume II – **Application Document Ref. 6.3**)) that was completed in advance of the riparian mammal surveys and informed the scoping of requirements for further survey.

2.1.2 Desk study results of relevance to the assessment have been carried forward into this report, and where appropriate this data is presented in more detail or re-interrogated for the needs of the current assessment.

### 2.2 Riparian Mammal Survey

2.2.1 The water vole and otter survey of the identified relevant waterbodies (see Section 1) was undertaken with reference to guidance given in Strachan *et al.* (2011) for water vole, and Chanin (2003a) and Crawford (2010) for otter.

2.2.2 To meet current good practice requirements for water vole survey, two survey visits were completed (Strachan *et al.*, 2011). These surveys were completed on 19<sup>th</sup> May and 12<sup>th</sup> August 2020.

2.2.3 Some waterbodies (Hatfield Waste Drain, Keadby Common Drain at Chapel Lane) were not identified as relevant until September 2020, so only one survey visit was possible, and this was completed on 20<sup>th</sup> October 2020.

2.2.4 The relevant waterbodies were surveyed from within the channel where possible, or on the bank face or bank top (as access and safety considerations permitted) if not, and searched for the following signs that would indicate the presence of water vole or otter:

#### Water Vole

- direct sightings;
- burrows and nests;
- faeces and latrines;
- feeding remains;
- lawns – around burrows there is often an area of grazed vegetation;
- footprints;
- runways – low tunnels within the vegetation; and
- auditory noises – characteristic ‘plop’ sound as animals enter a waterbody.

### Otter

- direct sightings;
- suitable habitat for holts (breeding sites);
- feeding remains;
- footprints;
- slides;
- spraints (faeces); and
- evidence of couches (resting or laying-up sites).

2.2.5 In most cases the presence of faeces/ latrines and footprints are the most reliable field evidence for riparian mammals, in the absence of direct sightings. Not all the other field signs are necessarily definitive to species level, or other factors may prevent a conclusive identification. Where the latter evidence was detected, in the absence of these more reliable field signs, then this evidence has been used with caution to infer the presence of riparian mammals.

2.2.6 The presence/ absence of mink (*Neovison vison*) and brown rat (*Rattus norvegicus*) was also recorded through their field signs, where present. These species may influence habitat suitability for water vole in particular and may help to explain an absence of field signs in habitats that otherwise appear to be highly suitable.

## **2.3 Nature Conservation Evaluation**

2.3.1 Evaluation of the relative nature conservation value of the identified ecological features within a site (encompassing nature conservation designations, ecosystems, habitat and species) is required to inform EclA. This report presents the evaluation for riparian mammals and the impact assessment is presented in **Chapter 11: Biodiversity and Nature Conservation (ES Volume I - Application Document Ref. 6.2)**.

2.3.2 The method of evaluation that has been utilised has been developed with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) *Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater and Coastal and Marine – Second Edition* (CIEEM, 2019). These guidelines give advice on scoping and carrying out environmental assessments and place appraisal in the context of relevant policies. Data received through consultation, desk-based studies and field-based surveys are used to allow ecological features of nature conservation value or potential value to be identified, and the main factors contributing to their value described and related to available guidance. This data can also be used to identify other relevant values e.g. socio-economic or ecosystem services values, but this is beyond the remit of this report and requires the involvement of other relevant specialists.

2.3.3 The value of a faunal species, such as riparian mammals, may relate, for example, to its geographic location (species may be rare and more valued towards the edge of their geographic range), the extent to which the component species are threatened throughout their range, or their rate of decline. The value of the riparian mammal species populations associated with the Proposed Development Site has been defined with reference to the geographical level at which it is considered to matter. This assessment has been made with reference to published guidance and criteria where available e.g. criteria to assess relative value within the context of Lincolnshire are given in Greater Lincolnshire Nature Partnership (2013).

## 2.4 Limitations

2.4.1 All of the surveys were undertaken at an appropriate time of year and during suitable weather conditions. There was no substantive rainfall prior to the surveys that might have washed field signs away.

2.4.2 The bankside vegetation along the northern bank of Drain 1 had recently been cut prior to the second survey visit. Although this did aid the search for water vole burrows along this bank, other evidence for both otter and water vole such as feeding remains, lawns, runs, paths and couches may have been lost as a consequence. However, this is unlikely to have impacted the search for reliable in-channel features to identify presence such as latrines/ spraints and footprints. Similarly, if water vole had been present, it would still have been possible to find field signs on the immediately opposite unaffected bank. As such, the cutting of one bank is not considered a significant limitation.

2.4.3 North Soak Drain was not surveyed during the first visit as access was not available. On the second visit, access was obtained but due to safety constraints, could only be surveyed from the top of the bank as the water depth was greater than 1m deep and much of the bank face was covered by bramble scrub. This may have meant that field signs were missed, however as the Proposed Development will not directly impact on this drain, this is not considered a limitation. Habitat quality was considered poor as described in Section 4 and shown in the photographs provided in **Annex B**. This drain will not be affected by the Proposed Development.

2.4.4 There was also no access to survey the eastern section of Drain 2 during the first survey. This is not a limitation, given that access was possible during the second visit. If water vole was present in this drain, then the second visit would have coincided with the peak in water vole activity (which tends to be towards the end of the survey season, after breeding).

2.4.5 Hatfield Waste Drain, Keadby Common Drain at Chapel Lane, and field drains in the proposed construction laydown area south of the Stainforth and Keadby Canal and north of the A18 were surveyed only once and relatively late in the year (20th October 2020). While the timing of the survey was not optimal, it was not possible to survey earlier in 2020 and water voles would still have been



active (if present) when the survey took place. Access to the banks of Hatfield Waste Drain was also poor, due to the steepness of the banks and the depth of the water within the drain. These are not considered limitations either at Chapel Lane or Mabey Bridge given the limited construction works proposed in these areas (installation of electrical connections and replacement of Mabey Bridge).

- 2.4.6 The drains associated with proposed temporary Construction Laydown Areas south of the Stainforth and Keadby Canal and north of the A18 will be subject to appropriate stand-offs and it is anticipated that access can be achieved without new crossing of these drains. A precautionary approach has been taken in the subsequent ecological impact assessment, including a commitment to re-survey all relevant drains prior to construction (regardless of prior survey effort applied to re-confirm the baseline).

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## 3.0 LEGISLATION, PLANNING POLICY AND RELATED GUIDANCE

3.1.1 The following wildlife legislation, planning policy and guidance is specifically relevant to the identification and assessment of potential constraints posed by the presence of riparian mammals. At this stage of assessment, this legislation, policy and guidance is primarily listed to demonstrate that an appropriate level of survey and assessment has been undertaken to meet likely data requirements for future decision-making regarding these material considerations.

3.1.2 Wider relevant biodiversity legislation, policy and guidance is detailed in **Appendix 11A: Biodiversity and Nature Conservation Legislation and Planning Policy** (ES Volume II - **Application Document Ref. 6.3**).

### 3.2 Water Vole

3.2.1 The water vole is protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (the Act). This makes it an offence to:

- intentionally capture, kill or injure water voles;
- damage, destroy or block access to their places of shelter or protection (on purpose or by not taking enough care);
- disturb them in a place of shelter or protection (on purpose or by not taking enough care); and
- possess, sell, control or transport live or dead water voles or parts of them (excluding water voles bred in captivity).

3.2.2 The Act provides a defence against the offences outlined above. However, the defence is only sustained if it can be argued that the potential offence was '*the incidental result of a lawful operation*' and '*could not reasonably have been avoided*' as set out in the Act. In order to demonstrate these two elements of the defence, as far as is reasonable, appropriate action would need to be taken to safeguard water vole and their shelters to ensure there is as little risk as possible of interfering with them. Short-term low-level disturbance which '*allows water vole to flee and then later return*' is not considered likely to trigger an offence under the Act. Where development cannot avoid potential offences then a licence may be required.

3.2.3 The Government has published standing advice (Natural England and Department for Environment, Food and Rural Affairs (Defra), 2015) to guide decision-makers on the determination of proposals with potential to affect protected species such as water vole. The guidance sets out responsibilities and minimum requirements for survey and mitigation.

3.2.4 The water vole is also considered a 'Species of Principal Importance for Nature Conservation in England' pursuant to Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Section 40 of the NERC Act requires

that local planning authorities have regard to the conservation of biodiversity in England, when carrying out their normal functions. The water vole is also included as a priority species for nature conservation within the Lincolnshire Local Biodiversity Action Plan (LBAP) (Lincolnshire Biodiversity Partnership, 2011).

### 3.3 Otter

3.3.1 The otter is fully protected as a European Protected Species (EPS) under the provisions of Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended). It is also protected under Sections 9 and 11 of the Wildlife and Countryside Act 1981 (as amended). Taken together this legislation makes it an offence to:

- capture, kill, disturb or injure otters (on purpose or by not taking enough care);
- damage or destroy a breeding or resting place (deliberately or by not taking enough care);
- obstruct access to their resting or sheltering places (deliberately or by not taking enough care); and
- possess, sell, control or transport live or dead otters, or parts of otters.

3.3.2 The otter is also a 'Species of Principal Importance for Nature Conservation in England' pursuant to Section 41 of the NERC Act 2006.

3.3.3 The Government has published standing advice (Natural England and Defra, 2019) to guide decision-makers on the determination of proposals with potential to affect protected species such as otter. The guidance sets out responsibilities and minimum requirements for survey and mitigation.

3.3.4 Where development cannot avoid potential offences, then it is possible to apply for a European Protected Species Mitigation Licence (EPSML). A licence is only likely to be granted for developments that can demonstrate compliance with the relevant standing advice.

3.3.5 The disturbance offence within the relevant legislation is not concerned with 'trivial' levels of disturbance which would be unlikely to adversely affect otter. There would only be a conflict with the above legislation where disturbance is of sufficient extent or magnitude to:

- impair the ability of otter to survive, to breed or reproduce, or to rear or nurture their young; or
- affect significantly the local distribution or abundance of the species.

3.3.6 It should be noted that there is no evidence that otters are particularly vulnerable to disturbance, except where this closely coincides with habitat features used by otters for breeding or resting. Otters will select resting sites where there is

limited risk of direct physical disturbance, but otherwise are tolerant of and do not necessarily avoid areas subject to human activity (Chanin, 2003b).

## 4.0 RESULTS

### 4.1 Desk Study

- 4.1.1 The desk study returned 25 individual water vole records made in the vicinity of the Proposed Development Site the period 2010-2020. Most of the records returned relate to drains within Keadby Wind Farm to the north and east of the Proposed Development Site. Two records were made from a drain next to the existing 400kV National Grid Substation off Chapel Lane, Keadby in the approximate vicinity of the route of the proposed Emergency Vehicle Access Road.
- 4.1.2 Previous water vole surveys of field drains bordering the former Keadby Ash Tip by AECOM in 2017 also found limited evidence of water vole in the vicinity of the Proposed Development Site. Two latrines and one water vole burrow, and associated feeding remains, were found on a short section of the minor field drain on the western boundary of the former Keadby Ash Tip.
- 4.1.3 These recent records indicate that water vole is widely distributed within the network of drains and other freshwater waterbodies in the vicinity of the Proposed Development Site.
- 4.1.4 In comparison, just four records of otter were returned and all date back to 2000. These records relate to just two locations. These are the Stainforth and Keadby Canal (in the vicinity of Vazon Bridge, off Chapel Lane, Keadby) 100m to the south of the Proposed Development Site, and the Warping Drain 420m north-east of the Proposed Development Site. Given these records, it should be assumed that otters may explore other minor waterbodies or make use of terrestrial habitats within the vicinity of the canal and Proposed Development Site.
- 4.1.5 No evidence of otter was found by AECOM in 2017 when surveying waterbodies associated with the former Keadby Ash Tip.

### 4.2 Water Vole Survey Results

- 4.2.1 **Figure 11F.1** (ES Volume II - **Application Document Ref. 6.3**) contained within this report shows the locations of the waterbodies surveyed and the associated locations of water vole field signs. A summary of results within each of the waterbodies surveyed for water vole is provided below and summarised in Table 1. Further information (including details on individual field signs, rather than peak counts) is provided on the survey forms within **Annex A**. Representative photographs of each waterbody are provided in **Annex B**.
- 4.2.2 Where present, an estimate on the number of water vole territories within each waterbody is provided to allow inference of the likely population size present.

#### Main Site - Drain 1 (Glew Drain)

- 4.2.3 This drain, located on the northern boundary of the Main Site, has a channel width of between 1 and 2m and variable water depths that are less than 0.6m throughout. The banks are of earth, so are suitable for water vole burrowing. The drain and its banks support extensive stands of suitable foodplants, including emergent grasses and sedges (**Annex B**, Photograph 1). Bankside trees are absent and there is no shading of the channel.
- 4.2.4 Drain 1 is connected at both its eastern and western extent to a network of drains in the wider landscape, such that it provides a potential movement corridor for water vole between other areas of suitable habitat. The other drainage ditches associated with Keadby Common (Drains 2 to 5) are connected to Drain 1.
- 4.2.5 Evidence of water vole was found within Drain 1 at three discrete sections along the length of the drain (refer to **Figure 11F.1** (ES Volume II - **Application Document Ref. 6.3**)). These locations are:
- between SE 81847 12227 to SE 81944 12212 (approximately 100m total drain length) two latrines and three burrows were found;
  - between SE 82006 12202 to SE 82057 12199 (approximately 50m length of drain), two latrines and one burrow were found; and
  - at SE 82152 12185 where a single latrine was present.
- 4.2.6 Given the limited number of burrows and latrines found, and the concentration of these in relatively discrete areas of the drain, it is considered that this drain supports a maximum of four water vole territories.

#### Main Site - Drain 2

- 4.2.7 This drain, located on the southern boundary of the Main Site, is separated into two discrete sections by a temporary construction haul road crossing for Keadby 2 Power Station.
- 4.2.8 The western section of the drain is approximately 2-3m wide with water depths of between 0.2 and 0.5m (**Annex B**, Photograph 2). This section of drain has earth banks. The southern bank is dominated by dense willow scrub, which overhangs the drain and casts heavy shade over approximately 70% of the channel, reducing the cover of wetland plant species and by so doing, making the habitat sub-optimal for water vole. The northern bank supports unmanaged rank, semi-improved grassland. In-channel and bank vegetation suitable to sustain water voles is restricted to the 30% of the channel where shading is reduced.
- 4.2.9 The eastern section of the drain is narrower (approximately 1-2m wide) and is dominated by reeds (**Annex B**, Photograph 3), so contains extensive suitable food plants for water vole. The earth banks support rank semi-improved

grassland. This whole section is dry and is judged to only support water during the wetter months of the year.

4.2.10 Evidence of water vole was present within a 60m section of the drain (between SE 81933 11872 and SE 81993 11873). A total of four latrines and three burrows were recorded within this area. Additional evidence of water vole presence and activity was present in the form of 30 feeding stations.

4.2.11 Given the limited number of burrows and latrines found, and the concentration of these in one short section of drain, it is considered that this drain supports a maximum of two water vole territories (and potentially just one).

#### Main Site - Drain 3

4.2.12 This drain, located on western boundary of the Main Site, has a channel width of 1-2m. During the first survey, the water depth was between 0.2 and 0.5m but the whole length was dry during the return survey. The drain is dominated by reeds along its entire length (**Annex B**, Photograph 4), so contains suitable food plants for water vole.

4.2.13 The drain has earth banks approximately 0.5 - 1m in height, one of which supports dense scrub, shading approximately 20% of the channel. The other supports unmanaged, rank semi-improved grassland.

4.2.14 There was no evidence of water vole associated with this drain. Given that the drain is regularly subject to drying, it is considered sub-optimal for water vole.

#### Main Site - Drain 4

4.2.15 This drain bisects the Main Site. The channel width is approximately 0.5m - 1m; the drain, has earth banks, and during the initial survey the water depth was very shallow (0.1m) and the channel was locally dry. By the second survey, the whole drain was dry. The drain is dominated by reeds along its entire length (**Annex B**, Photograph 5) so contains suitable food resources for water vole. Bankside trees are absent and there is no shading of the channel.

4.2.16 Very limited evidence of water vole was found, which was restricted to a single burrow with some associated feeding remains. This limited field evidence indicates the presence of only a single water vole territory. Given that the drain is subject to regular and prolonged drying, it is considered sub-optimal for water vole.

#### Main Site - Drain 5

4.2.17 This drain, on the eastern boundary of the Main Site has earth banks, a channel width of approximately 1-2m, and was dry during both surveys (a maximum depth of 10cm was recorded at the time of the preceding PEA, **Appendix 11C** (ES Volume II - **Application Document Ref. 6.3**)). The drain is dominated by

reeds along its entire length (**Annex B**, Photograph 6). Bankside trees are absent and there is no shading of the channel.

4.2.18 There was no evidence of water vole associated with this drain. Given that the drain is regularly subject to drying, it is considered sub-optimal for water vole.

#### North Soak Drain

4.2.19 The section of the drain associated with the Proposed Development Site is approximately 10m wide and is greater than 1m in depth. The drain supports occasional small stands of reeds with the open water areas but is otherwise devoid of vegetation suitable to sustain water vole (**Annex B**, Photograph 7).

4.2.20 The drain has steep earth banks approximately 1-2m in height. The southern bank between North Soak Drain and the Stainforth and Keadby Canal supports dense bramble scrub, while the other bank supports rank, unmanaged semi-improved grassland with tall ruderals. Bankside trees are absent and there is no shading of the channel.

4.2.21 There was no evidence of water vole associated with this drain. There is minimal food resource for water vole and as such the drain is considered to be sub-optimal for this species. Previous surveys for Keadby 2 Power Station also did not find water vole in this drain.

#### Stainforth and Keadby Canal

4.2.22 At the location of the Proposed Development Site, the canal is approximately 40m wide and greater than 1m in depth. The water column is dominated by submerged aquatic plants, with isolated stands of reeds present in the margins (**Annex B**, Photograph 8).

4.2.23 The banks of the canal are vertical and where visible were concrete. Bankside trees and scrub are present on the northern bank of the canal, however given its width, shading to the channel is negligible.

4.2.24 Given the prevailing habitat conditions, a water vole survey was not conducted. The banks are unsuitable for water vole and there is minimal food resource. The canal was therefore deemed unsuitable for water vole and was scoped out.

#### River Trent

4.2.25 At the location of the existing Keadby 1 Power Station cooling water intake and outfall structures, the River Trent is a large (approximately 150m wide) tidal river (**Annex B**, Photograph 9) and is therefore unsuitable for water vole. Water vole is therefore scoped out in relation to the River Trent.



#### Hatfield Waste Drain

- 4.2.26 At the location of the existing Mabey Bridge crossing, the drain is approximately 10m wide and greater than 1m deep. The only aquatic vegetation apparent at the time of survey was a narrow marginal fringe of reed sweet-grass (*Glyceria maxima*) (**Annex B**, Photograph 10).
- 4.2.27 The drain has steep earth banks approximately 1-2m in height. The banks are dominated by rank grasses, tall ruderal herbs and in places scrub. Bankside trees are absent and there is no shading of the channel.
- 4.2.28 There was no evidence of water vole associated with this drain, but survey access was poor due to the steep banks. Water vole is unlikely to be relevant given the proposed works are restricted to the replacement of the existing Mabey Bridge, but if the construction approach changes then a re-survey by boat prior to construction may be required to inform the planning of construction works.

#### Keadby Common Drain Adjacent to Chapel Lane

- 4.2.29 At the location of the potential 132kV connection to the Northern Powergrid Substation, the drain is over-deepened. It has a channel width of between 1 and 2m and variable water depths that are less than 0.5m throughout. The banks are of earth, so are suitable for water vole burrowing. The drain and its banks support extensive stands of suitable foodplants, including emergent grasses and sedges (**Annex B**, Photograph 11). Bankside trees are absent and there is no shading of the channel.
- 4.2.30 The banks of the drain are very steep and eroded/ slumping in places with exposed bare earth. Where vegetation is present, this is dominated by rank grasses and herbs.
- 4.2.31 Evidence of water vole was found in scattered locations along a 75m stretch of this drain within the Proposed Development Site (**Figure 11F.1** (ES Volume II - **Application Document Ref. 6.3**)). The distribution of field signs was:
- between SE 82761 11971 to SE 82797 11967 (approximately 35m total drain length) three latrines and three burrows were found;
  - at SE 82815 11959 one latrine was found; and
  - at SE 82834 11959 one latrine and one burrow were present.
- 4.2.32 Given the limited number of burrows and latrines found, and the concentration of these in relatively discrete areas of the drain, it is considered that this section of drain supports a maximum of four water vole territories.

Construction Laydown Area – Drains 7a-7c and 8-10

4.2.33 These drains comprise a cohesive network of field drains within land at Pilfrey Farm (**Annex B**, Photograph 12 to 17). They are all approximately 2m wide and steep earth banks dominated by rank grasses and ruderal herbs. Water levels are variable, with Drains 7b and 8 completely dry and only likely to hold water during the winter, and the remaining drains with water depths of less than 0.5m (generally much less than this, except in localised areas). None of the drains are shaded by trees.

4.2.34 Given the shallow water depths, all of these drains were easily accessed for survey. There was no evidence of water vole associated with any of these drains.

**Table 1: Water vole field signs recorded within each waterbody**

Waterbody Reference*	Evidence of Water Vole Found?	Water Vole Field Signs (Peak Count)			
		Burrows	Latrines	Other Field Signs	Estimate of Water Vole Territories
1 (Glew Drain)	Yes	4	5	2 feeding remains	4
				1 feeding remains	
				None	
2	Yes	3	4	30 feeding remains	2
3	No	0	0	None	0
4	Yes	1	0	1 feeding remains	1
5	No	0	0	None	0
North Soak Drain	No	0	0	None	0
Hatfield Waste Drain	No	0	0	None	0
Keadby Common Drain	Yes	4	5	None	4
7a	No	0	0	None	0
7b	No	0	0	None	0

7c	No	0	0	None	0
8	No	0	0	None	0
9	No	0	0	None	0
10	No	0	0	None	0

\* refer to **Figure 11F.1** and **Figure 11C.3** presented in **Appendix 11C – ES Volume II – Application Document Ref. 6.3)**

### 4.3 Otter Survey Results

#### Main Site (Drains 1, 2, 3, 4 and 5)

- 4.3.1 No evidence of otter was found in association with the minor waterbodies on the Main Site, or in adjacent terrestrial habitats.
- 4.3.2 While otters will explore small waterbodies in their territories, such use would be transitory only, unless there were suitable habitat features to encourage more regular use. In this case, the habitat conditions present are sub-optimal for otter given most of the drains dry up during the summer and only hold shallow water during the wetter months of the year. Most of the drains are therefore not suitable to sustain a regular presence of fish, and therefore do not provide represent attractive foraging habitat for otter. Drain 1 (Glew Drain) holds permanent water but is still a very minor waterbody and is only likely to support minor fish species.
- 4.3.3 Cover was also poor along most drains, making it unlikely that otter would use the waterbodies of Keadby Common for lying-up or for holts. Only Drains 2 and 3 had any substantive bankside cover, and this was dense scrub with little cover at ground level. No evidence of otter, or habitat features suitable for use by otter, was found in association with this scrub.
- 4.3.4 Given the above habitat conditions, it is considered that otter will not make any substantive use of the drains associated with Keadby Common.

#### North Soak Drain and Keadby Canal

- 4.3.5 No evidence of otter was recorded in association with these two waterbodies and their adjacent terrestrial habitats. The areas of mature woodland and scrub next to the Proposed Development Site did not have sufficient cover or other habitat features at ground level suitable for use by otters as couches or holts.
- 4.3.6 Currently the land required for the Proposed Development is subject to ongoing construction works for Keadby 2 Power Station (**Annex B**, Photograph 18 and 19). Otter has not been identified as a constraint to these construction works, and while construction works are ongoing, this area is unlikely to be attractive to otter.

- 4.3.7 Otter is not considered a constraint in relation to potential works associated with the Proposed Development in the vicinity of the North Soak Drain and the Stainforth and Keadby Canal.

#### River Trent

- 4.3.8 The survey for otter was restricted to inspections of suitable terrestrial habitat associated with the Proposed Development Site. The River Trent is only relevant to the Proposed Development because of the option to use its existing water intake and outfall structures. As such, although otter will likely forage along the Trent, the Proposed Development has limited potential to affect the species when it is using this large waterbody.
- 4.3.9 The banks of the Trent in association with the Proposed Development are immediately adjacent to a road and are used for recreation by residents of the village. The banks are predominantly under mown improved grassland, with small and narrow stands of scrub and common reed at the edge of the channel. The latter provides limited cover for otter, making it unlikely that otter would preferentially use these areas for lying-up or for holts given the wider resource of less disturbed habitat along the River Trent.
- 4.3.10 No evidence of otter was recorded in association with the River Trent. Otter is not considered to be a constraint in relation to potential works associated with the Proposed Development on the banks of the River Trent.

#### Hatfield Waste Drain

- 4.3.11 No evidence of otter was found in association with this drain. The drain runs parallel to a busy road and there is no vegetation in association with the steep banks that otters could use for shelter. Given this, otter may forage along the drain at night, but is unlikely to be present during daylight hours.
- 4.3.12 Given the limited extent and construction requirements for the proposed Mabey Bridge replacement works, otter is not considered a relevant constraint.

#### Keadby Common Drain Adjacent to Chapel Lane

- 4.3.13 No evidence of otter was found in association with this small drain. The drain runs parallel to a road and is close to residential areas and routes used for public amenity. There is no vegetation in association with the steep banks that otters could use for shelter. Given these conditions, otter is very unlikely to use this drain.
- 4.3.14 Given the limited extent and construction requirements for the proposed connection to the 132kV substation, should this option be selected, otter is not considered a relevant constraint.

Potential Laydown Area – Drains 7a-7c and 8-10

- 4.3.15 No evidence of otter was found in association with the minor waterbodies and adjacent terrestrial habitats are not suitable to be utilised by otter for refuge.
- 4.3.16 Given the habitat conditions present, which are comparable to or less suitable than Drains 1 to 5 as described above, it is considered that otter will not make any more than rare exploratory use of these drains, or as an opportunistic occasional route to move between Hatfield Waste Drain to the south and the Sheffield and South Yorkshire Navigation habitat corridor to the north.

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## 5.0 CONCLUSIONS AND NATURE CONSERVATION EVALUATION

### 5.1 Overview

5.1.1 This section provides an assessment of the riparian mammals recorded in association with the Proposed Development Site to determine their relative nature conservation value.

### 5.2 Water Vole

#### Main Site (Drains 1, 2, 3, 4 and 5) and the connected Keadby Common Drain

5.2.1 Given that all these surveyed waterbodies are located in close proximity to each other and are connected, they have been evaluated together.

5.2.2 Field signs were found in a number of discrete locations, indicating that there is only a small and perhaps (at least in the case of the Main Site) transitory population of water voles associated with the drains within the Proposed Development Site (likely to be less than 14 territories and individuals). It is possible that the sub-optimal drains of the Main Site in particular support animals displaced from more optimal waterbodies elsewhere, and that there is a high turnover of water voles within the Main Site drains year to year.

5.2.3 Lincolnshire is a stronghold for water vole, supporting a successful and widespread population, and sightings or their associated field signs can be expected in most suitable waterbodies throughout the county (Lincolnshire Biodiversity Partnership, 2011). The desk study undertaken for the PEA identified a large number of similar drains in the local area, which when considered with the number of desk study records, suggests that this species is relatively common in the wider landscape surrounding the Proposed Development Site. The small numbers of water voles recorded indicates the relevant sections of drain are of less than county value for the species. The small numbers of water vole recorded are likely to make a minor contribution to the wider population, especially given the habitat conditions present indicate that the territories on the Main Site may not be sustainable over the long-term.

5.2.4 Given the above it is considered that these drains within the Proposed Development Site support a water vole population of local value.

### 5.3 Otter

5.3.1 The surveys found no evidence of otter associated with the Proposed Development Site.

5.3.2 As highlighted within the Section 4, it is assumed that otters are moving and foraging along the River Trent and the Stainforth and Keadby Canal habitat corridor, and potentially the other waterbodies associated with the Proposed Development Site. However, there is no evidence that habitats within the Proposed Development Site are of specific importance for otter and there is no

evidence that otter currently uses the habitats associated the Proposed Development Site for breeding or resting.

- 5.3.3 Otter is not considered to be a constraint to the Proposed Development, so further assessment is not required. However, top-up surveys are likely to be required in future years to reconfirm the status of the species and the suitability of the habitats present.

## 6.0 REFERENCES

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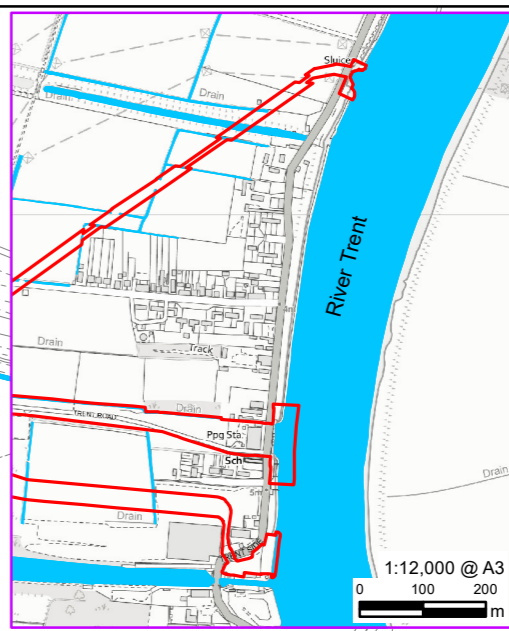
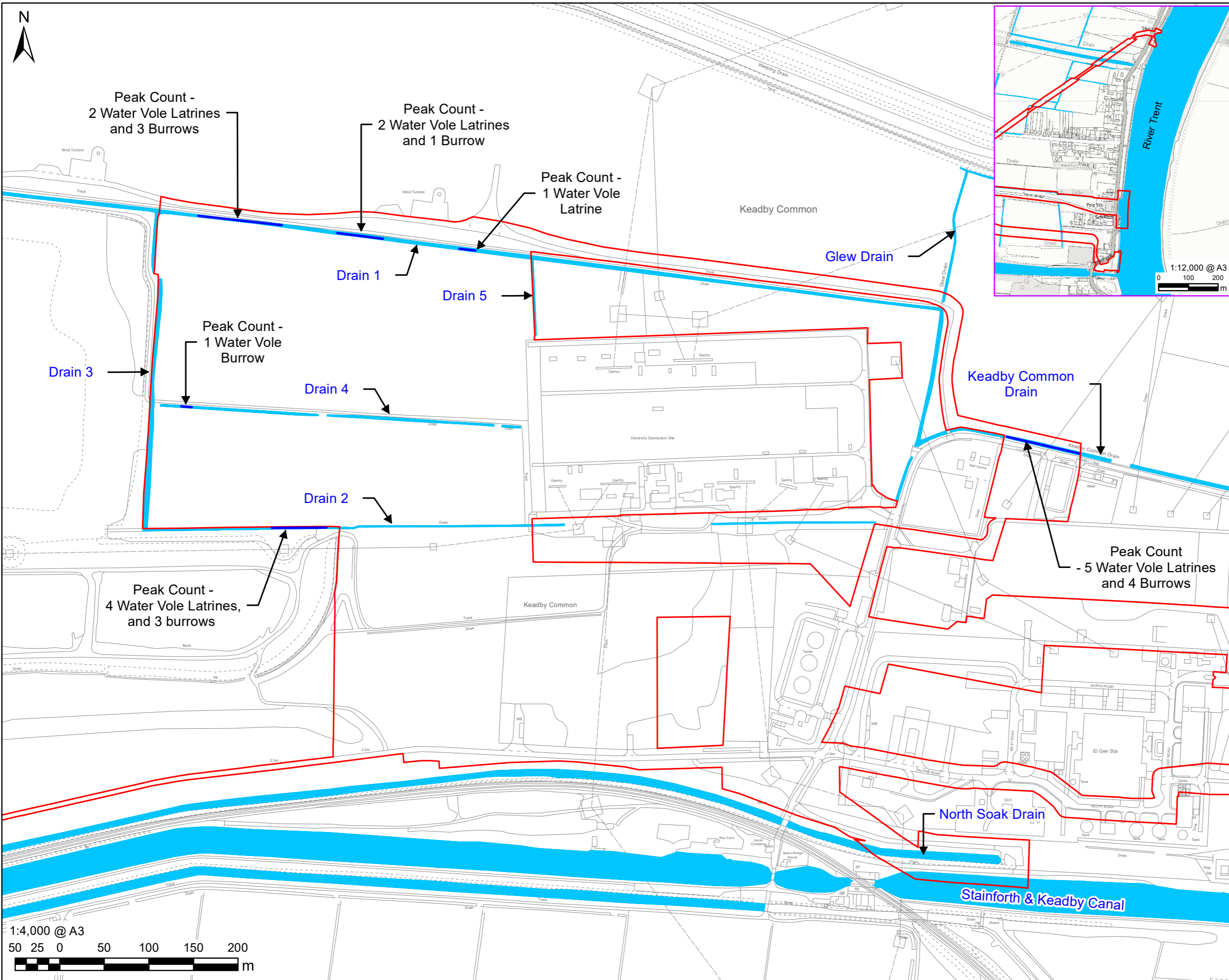
Strachan, R., Moorhouse, T. & Gelling, M. (2011). *Water Vole Conservation Handbook, 3<sup>rd</sup> edition*. WildCRU, Oxford.



## FIGURE 11F.1 RIPARIAN SIGNS

Filename: K:\07 CAD & GIS\02\_Maps\PEA Preliminary Environmental Assessment\ES\_Version\K\_ES\_PEA\_Fig\_11F.1\_Riparian\_Signs\_A3\_20210507\_R01.mxd

Revision: 01 Drawn: TD Checked: JW Approved: CW Date: 13/05/2021



**AECOM**

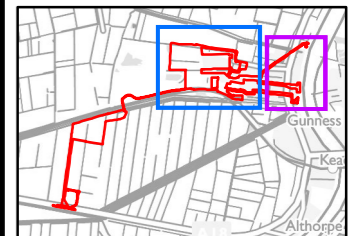
**PROJECT**  
The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

**CLIENT**  
Keadby Generation Limited

**CONSULTANT**  
AECOM Limited  
2 City Walk  
Leeds  
LS11 9AR  
T: 0113 391 6800  
www.aecom.com

**LEGEND**

- The Order Limits
- Running Water
- Water Vole Field Signs



**NOTES**  
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**ISSUE PURPOSE**  
RIPARIAN MAMMAL SURVEY REPORT

**PROJECT NUMBER**  
60625943

**SHEET TITLE**  
Riparian Mammal Field Signs

**SHEET NUMBER**  
Figure 11F.1

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## **ANNEX A RIPARIAN MAMMAL SURVEY FORMS**

<b>Watercourse Number:</b>	Drain 1		<b>Date of Survey:</b>	19/05/2020									
<b>Grid Reference Start:</b>	SE 81803 12232		<b>Grid Reference Finished:</b>	SE 82224 12180									
<b>Further Notes:</b>													
<b>Watercourse Information (results in bold and italics):</b>													
<b>Habitat Type:</b>	Coast	Lake	Pond	Main River	Stream	<b>Ditch</b>	Canal	Bog/Marsh					
<b>Shore Type:</b>	Boulders	Stones	Gravel	Sand	Silt	<b>Earth</b>	Rock Cliffs	Earth Cliffs	Canalized	Poached	Reinforced		
<b>Current:</b>	Rapid		Fast	Slow		Sluggish		<b>Static</b>					
<b>Width:</b>	<1m	<b>1-2m</b>	2-5m	5-10m	10-20m	20-40m	>40m						
<b>Mean Water Depth:</b>	<0.5m		<b>0.5-1m</b>		1-2m		>2m						
<b>Bank Treatment:</b>	Canalised			Maintained			<b>Wild/Semi-Natural</b>						
<b>Bank Profile</b>	Flat <10°		Shallow <45°		<b>Steep &gt;45°</b>		Vertical/Undercut						
<b>Bank-full Height</b>	<0.5m		0.5-1m		<b>1-2m</b>		>2m						
<b>Water Use:</b>	Water Abstraction	Power Boating	Sail Boating	Manpower Boating	Bankside Angling	Bankside Shooting	Keepered	Reserve	<b>None</b>				
<b>Bordering Land Use:</b>	Upland Grass	<b>Permanent /Temporary Grass</b>	Broad-leaved Woodland	Conifer Woodland	Peat Bog	<b>Arable</b>	Salt Marsh	Urban Industrial	Park Garden	Heath	Fen	Cattle Grazed	Bank Fenced
<b>Pollution:</b>	<b>Unpolluted</b>			Domestic			Agriculture			Industrial			
<b>Weed Control:</b>	Mechanical			Chemical			<b>None</b>						
<b>Disturbance Factor 1-5</b>	<b>1 (low)</b>		2		3		4		5 (high)				

Results Overview: Including details of field sign, count and National Grid Reference Numbers

Water Vole	Otter	Other Species (Mink and Rat)	Vegetation Types	DAFORN Rating
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings	Bankside Trees	N
<input checked="" type="checkbox"/> <b>Latrines 3</b> - SE 81926 12221, SE 81944 12212 & SE 82006 12202	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat	Bankside Bushes	N
<input checked="" type="checkbox"/> <b>Burrows 4</b> - SE 81844 12217, SE 81926 12221, SE 81944 12212 & SE 82006 12202	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Mink Footprints/Runs	Bankside Herbs	O
<input type="checkbox"/> Footprints	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Sightings	Submerged Weed	F
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings	Floating Weed	R
<input checked="" type="checkbox"/> <b>Feeding Remains 3</b> - SE 81926 12221, SE 81944 12212 & SE 82006 12202		<input type="checkbox"/> Rat Footprints	Emergents	N
<input type="checkbox"/> Lawns			Marginals – Reeds/Sedges/Rushes	F
			Bankside Grasses	D

<b>Watercourse Number:</b>	Drain 1	Date of Survey:	12/08/2020
Grid Reference Start:	SE 81803 12232	Grid Reference Finished:	SE 82224 12180
Further Notes: The bank along the northern margin of the drain had recently been cut.			
<i>Watercourse Information (results in bold and italics):</i>			
Habitat Type:	Coast	Lake	Pond
Shore Type:	Boulders	Stones	Gravel
Current:	Rapid	Fast	Slow
Width:	<1m	<b>1-2m</b>	2-5m
Mean Water Depth:	<0.5m	<b>0.5-1m</b>	1-2m
Bank Treatment:	Canalised	<b>1 - Maintained (recently cut)</b>	<b>1 - Wild/Semi-Natural</b>
Bank Profile:	Flat <10°	Shallow <45°	<b>Steep &gt;45°</b>
Bank-full Height:	<0.5m	0.5-1m	<b>1-2m</b>
Water Use:	Water Abstraction	Power Boating	Sail Boating
Bordering Land Use:	Upland Grass	<i>Permanent/Temporary Grass</i>	Broad-leaved Woodland
Pollution:	<b>Unpolluted</b>		Domestic
Weed Control:	<b>Mechanical (one bank)</b>		Chemical
Disturbance Factor 1-5	1 (low)	2	3

Results Overview: Including details of field sign, count and National Grid Reference Numbers

Water Vole	Otter	Other Species (Mink and Rat)	Vegetation Types	DAFORN Rating
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings	Bankside Trees	N
<input checked="" type="checkbox"/> Latrines - 4 (SE 81875 12221, SE 81900 12219, SE 82057 12199, SE 82152 12185)	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat	Bankside Bushes	N
<input checked="" type="checkbox"/> Burrows 1 (SE 81847 12227)	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Mink Footprints/Runs	Bankside Herbs	O
<input type="checkbox"/> Footprints	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Rat Sightings	Submerged Weed	F
<input type="checkbox"/> Pathways	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Droppings	Floating Weed	R
<input type="checkbox"/> Feeding Remains		<input type="checkbox"/> Rat Footprints	Emergents	N
<input type="checkbox"/> Lawns			Marginals - Reeds/Sedges/Rushes	F
			Bankside Grasses	D

<b>Watercourse Number:</b>	Drain 2	Date of Survey:	12/08/2020
Grid Reference Start:	SE 82302 11884	Grid Reference Finished:	SE 81788 11878
Further Notes: Whole area accessible for survey. The eastern section between SE 82036 11878 and SE 82302 11884 was dry.			
<b>Watercourse Information (results in bold and italics):</b>			
Habitat Type:	Coast	Lake	Pond
Shore Type:	Boulders	Stones	Gravel
Current:	Rapid	Fast	Slow
Width:	<1m	1-2m	2-5m
Mean Water Depth:	<b>&lt;0.5m (Dry in places)</b>		0.5-1m
Bank Treatment:	Canalised	Maintained	<b>Wild/Semi-Natural</b>
Bank Profile	Flat <10°	Shallow <45°	<b>Steep &gt;45°</b>
Bank-full Height	<0.5m	0.5-1m	1-2m
Water Use:	Water Abstraction	Power Boating	Sail Boating
Bordering Land Use:	Scrub	Permanent/Temporary Grass	Broad-leaved Woodland
Pollution:	<b>Unpolluted</b>		Domestic
Weed Control:	Mechanical		Chemical
Disturbance Factor 1-5	<b>1 (low)</b>	2	3

Results Overview: Including details of field sign, count and National Grid Reference Numbers

Water Vole	Otter	Other Species (Mink and Rat)	Vegetation Types	DAFORN Rating
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings	Bankside Trees	F
<input checked="" type="checkbox"/> Latrines 4 – <b>SE 81959 11874, SE 81942 11873, SE 81937 11873, SE 81984 11876</b>	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat	Bushes	N
<input type="checkbox"/> Burrows	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Mink Footprints/Runs	Herbs	N
<input type="checkbox"/> Footprints	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Sightings	Submerged Weed	N
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings	Floating Weed	N
<input checked="" type="checkbox"/> <b>Feeding Remains - 30 discreet areas between SE81916 11877 and SE82007 11878)</b>		<input type="checkbox"/> Rat Footprints	Emergents	N
<input type="checkbox"/> Lawns			Marginals – Reeds/Sedges/Rushes	F
			Tall Grass	N
			Short Grass	N

<b>Watercourse Number:</b>	Drain 2	Date of Survey:	12/08/2020
Grid Reference Start:	SE 82302 11884	Grid Reference Finished:	SE 81788 11878
Further Notes: Whole area accessible for survey. The eastern section between SE 82036 11878 and SE 82302 11884 was dry.			

**Watercourse Information (results in bold and italics):**

Habitat Type:	Coast	Lake	Pond	Main River	Stream	<b>Ditch</b>	Canal	Bog/Marsh					
Shore Type:	Boulders	Stones	Gravel	Sand	Silt	<b>Earth</b>	Rock Cliffs	Earth Cliffs	Canalized	Poached	Reinforced		
Current:	Rapid		Fast	Slow		Sluggish		<b>Static</b>					
Width:	<1m	1-2m	<b>2-5m</b>	5-10m	10-20m	20-40m	>40m						
Mean Water Depth:	<b>&lt;0.5m (Dry in places)</b>		0.5-1m	1-2m		>2m							
Bank Treatment:	Canalised		Maintained		<b>Wild/Semi-Natural</b>								
Bank Profile:	Flat <10°		Shallow <45°		<b>Steep &gt;45°</b>		Vertical/Undercut						
Bank-full Height:	<0.5m		0.5-1m		<b>1-2m</b>		>2m						
Water Use:	Water Abstraction	Power Boating	Sail Boating	Manpower Boating	Bankside Angling	Bankside Shooting	Keeped	Reserve	<b>None</b>				
Bordering Land Use:	Scrub	<b>Permanent/Temporary Grass</b>	Broad-leaved Woodland	Conifer Woodland	Peat Bog	Arable	Salt Marsh	Urban Industrial	Park Garden	Heath	Fen	Cattle Grazed	Bank Fenced
Pollution:	<b>Unpolluted</b>			Domestic		Agriculture		Industrial					
Weed Control:	Mechanical			Chemical				<b>None</b>					
Disturbance Factor 1-5	<b>1 (low)</b>		2		3		4		5 (high)				

**Results Overview:** Including details of field sign, count and National Grid Reference Numbers

Water Vole	Otter	Other Species (Mink and Rat)
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings
<input checked="" type="checkbox"/> Latrines 4 – <b>SE 81959 11874, SE 81942 11873, SE 81937 11873, SE 81984 11876</b>	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat
<input type="checkbox"/> Burrows		<input type="checkbox"/> Mink Footprints/Runs
<input type="checkbox"/> Footprints	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Rat Sightings
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings
<input checked="" type="checkbox"/> <b>Feeding Remains - 30 discreet areas between SE81916 11877 and SE82007 11878)</b>	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Footprints
<input type="checkbox"/> Lawns		

Vegetation Types	DAFORN Rating
Bankside Trees	F
Bushes	N
Herbs	N
Submerged Weed	N
Floating Weed	N
Emergents	N
Marginals – Reeds/Sedges/Rushes	F
Tall Grass	N
Short Grass	N

<b>Watercourse Number:</b>	Drain 3		<b>Date of Survey:</b>	19/05/2020									
<b>Grid Reference Start:</b>	SE 81805 12223		<b>Grid Reference Finished:</b>	SE 81790 11883									
<b>Further Notes:</b>													
<i>Watercourse Information (results in bold and italics):</i>													
<b>Habitat Type:</b>	Coast	Lake	Pond	Main River	Stream	<b>Ditch</b>	Canal	Bog/Marsh					
<b>Shore Type:</b>	Boulders	Stones	Gravel	Sand	Silt	<b>Earth</b>	Rock Cliffs	Earth Cliffs	Canalized	Poached	Reinforced		
<b>Current:</b>	Rapid		Fast	Slow		Sluggish		<b>Static</b>					
<b>Width:</b>	<1m	<b>1-2m</b>	2-5m	5-10m		10-20m	20-40m		>40m				
<b>Mean Water Depth:</b>	<b>&lt;0.5m</b>		0.5-1m		1-2m		>2m						
<b>Bank Treatment:</b>	Canalised			Maintained			<b>Wild/Semi-Natural</b>						
<b>Bank Profile</b>	Flat <10°			Shallow <45°			<b>Steep &gt;45°</b>		Vertical/Undercut				
<b>Bank-full Height</b>	<0.5m		<b>0.5-1m</b>		1-2m		>2m						
<b>Water Use:</b>	Water Abstraction	Power Boating	Sail Boating	Manpower Boating	Bankside Angling	Bankside Shooting	Keeped	Reserve	<b>None</b>				
<b>Bordering Land Use:</b>	Upland Grass	<i>Permanent/Temporary Grass</i>	<i>Broad-leaved Woodland</i>	Conifer Woodland	Peat Bog	Arable	Salt Marsh	Urban Industrial	Park Garden	Heath	Fen	Cattle Grazed	Bank Fenced
<b>Pollution:</b>	<b>Unpolluted</b>			Domestic			Agriculture			Industrial			
<b>Weed Control:</b>	Mechanical			Chemical			<b>None</b>						
<b>Disturbance Factor 1-5</b>	<b>1 (low)</b>		2		3		4		5 (high)				

Results Overview: Including details of field sign, count and National Grid Reference Numbers

<b>Water Vole</b>	<b>Otter</b>	<b>Other Species (Mink and Rat)</b>	<b>Vegetation Types</b>	<b>DAFORN Rating</b>
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings	Bankside Trees	F
<input type="checkbox"/> Latrines	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat	Bankside Bushes	N
<input type="checkbox"/> Burrows		<input type="checkbox"/> Mink Footprints/Runs	Bankside Herbs	O
<input type="checkbox"/> Footprints	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Rat Sightings	Submerged Weed	N
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings	Floating Weed	N
<input type="checkbox"/> Feeding Remains	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Footprints	Emergents	N
<input type="checkbox"/> Lawns			Marginals – Reeds/Sedges/Rushes	D
			Bankside Grasses	F



<b>Watercourse Number:</b>	Drain 3			<b>Date of Survey:</b>	12/08/2020								
<b>Grid Reference Start:</b>	SE 81805 12223			<b>Grid Reference Finished:</b>	SE 81790 11883								
<b>Further Notes:</b>													
<i>Watercourse Information (results in bold and italics):</i>													
<b>Habitat Type:</b>	Coast	Lake	Pond	Main River	Stream	<b>Ditch</b>	Canal	Bog/Marsh					
<b>Shore Type:</b>	Boulders	Stones	Gravel	Sand	Silt	<b>Earth</b>	Rock Cliffs	Earth Cliffs	Canalized	Poached	Reinforced		
<b>Current:</b>	<b>Dry</b>		Fast	Slow		Sluggish		Static					
<b>Width:</b>	<1m	<b>1-2m</b>	2-5m	5-10m	10-20m	20-40m	>40m						
<b>Mean Water Depth:</b>	<b>Dry</b>		<0.5m		0.5-1m		1-2m						
<b>Bank Treatment:</b>	Canalised			Maintained			<b>Wild/Semi-Natural</b>						
<b>Bank Profile</b>	Flat <10°			Shallow <45°			<b>Steep &gt;45°</b>		Vertical/Undercut				
<b>Bank-full Height</b>	<0.5m		<b>0.5-1m</b>			1-2m		>2m					
<b>Water Use:</b>	Water Abstraction	Power Boating	Sail Boating	Manpower Boating	Bankside Angling	Bankside Shooting	Keepereed	Reserve	<b>None</b>				
<b>Bordering Land Use:</b>	Upland Grass	<b>Permenant /Temporary Grass</b>	<b>Broad-leaved Woodland</b>	Conifer Woodland	Peat Bog	Arable	Salt Marsh	Urban Industrial	Park Garden	Heath	Fen	Cattle Grazed	Bank Fenced
<b>Pollution:</b>	<b>Unpolluted</b>			Domestic			Agriculture			Industrial			
<b>Weed Control:</b>	Mechanical			Chemical			<b>None</b>						
<b>Disturbance Factor 1-5</b>	<b>1 (low)</b>		2		3		4		5 (high)				

Results Overview: Including details of field sign, count and National Grid Reference Numbers

Water Vole	Otter	Other Species (Mink and Rat)	Vegetation Types	DAFORN Rating
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings	Bankside Trees	F
<input type="checkbox"/> Latrines	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat	Bankside Bushes	N
<input type="checkbox"/> Burrows		<input type="checkbox"/> Mink Footprints/Runs	Bankside Herbs	O
<input type="checkbox"/> Footprints	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Rat Sightings	Submerged Weed	N
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings	Floating Weed	N
<input type="checkbox"/> Feeding Remains	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Footprints	Emergents	N
<input type="checkbox"/> Lawns			Marginals –	D
			Reeds/Sedges/Rushes	
			Bankside Grasses	F

<b>Watercourse Number:</b>	Drain 4	Date of Survey:	19/05/2020
Grid Reference Start:	SE 82212 11990	Grid Reference Finished:	SE 81800 12016
Further Notes:			

*Watercourse Information (results in bold and italics):*

Habitat Type:	Coast	Lake	Pond	Main River	Stream	<b>Ditch</b>	Canal	Bog/Marsh					
Shore Type:	Boulders	Stones	Gravel	Sand	Silt	<b>Earth</b>	Rock Cliffs	Earth Cliffs	Canalized	Poached	Reinforced		
Current:	Rapid		Fast	Slow		Sluggish		<b>Static</b>					
Width:	<1m	<b>1-2m</b>	2-5m	5-10m	10-20m	20-40m	>40m						
Mean Water Depth:	<b>&lt;0.5m</b>		0.5-1m		1-2m		>2m						
Bank Treatment:	Canalised			Maintained			<b>Wild/Semi-Natural</b>						
Bank Profile	Flat <10°			Shallow <45°		<b>Steep &gt;45°</b>		Vertical/Undercut					
Bank-full Height	<0.5m		0.5-1m		<b>1-2m</b>		>2m						
Water Use:	Water Abstraction	Power Boating	Sail Boating	Manpower Boating	Bankside Angling	Bankside Shooting	Keepereed	Reserve	<b>None</b>				
Bordering Land Use:	Upland Grass	<b>Permanent /Temporary Grass</b>	Broad-leaved Woodland	Conifer Woodland	Peat Bog	Arable	Salt Marsh	Urban Industrial	Park Garden	Heath	Fen	Cattle Grazed	Bank Fenced
Pollution:	<b>Unpolluted</b>			Domestic			Agriculture			Industrial			
Weed Control:	Mechanical			Chemical			<b>None</b>						
Disturbance Factor 1-5	<b>1 (low)</b>		2		3		4		5 (high)				

Results Overview: Including details of field sign, count and National Grid Reference Numbers

Water Vole	Otter	Other Species (Mink and Rat)	Vegetation Types	DAFORN Rating
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings	Bankside Trees	N
<input type="checkbox"/> Latrines	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat	Bankside Bushes	N
<input type="checkbox"/> Burrows	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Mink Footprints/Runs	Bankside Herbs	O
<input type="checkbox"/> Footprints	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Sightings	Submerged Weed	N
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings	Floating Weed	N
<input type="checkbox"/> Feeding Remains		<input type="checkbox"/> Rat Footprints	Emergents	N
<input type="checkbox"/> Lawns			Marginals – Reeds/Sedges/Rushes	D
			Bankside Grasses	D

<b>Watercourse Number:</b>	Drain 4			<b>Date of Survey:</b>	12/08/2020								
<b>Grid Reference Start:</b>	SE 82212 11990			<b>Grid Reference Finished:</b>	SE 81800 12016								
<b>Further Notes:</b>													
<i>Watercourse Information (results in bold and italics):</i>													
<b>Habitat Type:</b>	Coast	Lake	Pond	Main River	Stream	<b>Ditch</b>	Canal	Bog/Marsh					
<b>Shore Type:</b>	Boulders	Stones	Gravel	Sand	Silt	<b>Earth</b>	Rock Cliffs	Earth Cliffs	Canalized	Poached	Reinforced		
<b>Current:</b>	<b>Dry</b>		Fast	Slow		Sluggish		Static					
<b>Width:</b>	<1m	<b>1-2m</b>	2-5m	5-10m	10-20m	20-40m	>40m						
<b>Mean Water Depth:</b>	<b>Dry</b>		<0.5m		0.5-1m		1-2m						
<b>Bank Treatment:</b>	Canalised			Maintained			<b>Wild/Semi-Natural</b>						
<b>Bank Profile</b>	Flat <10°		Shallow <45°		<b>Steep &gt;45°</b>		Vertical/Undercut						
<b>Bank-full Height</b>	<0.5m		0.5-1m		<b>1-2m</b>		>2m						
<b>Water Use:</b>	Water Abstraction	Power Boating	Sail Boating	Manpower Boating	Bankside Angling	Bankside Shooting	Keepereed	Reserve	<b>None</b>				
<b>Bordering Land Use:</b>	Upland Grass	<b>Permanent/Temporary Grass</b>	Broad-leaved Woodland	Conifer Woodland	Peat Bog	Arable	Salt Marsh	Urban Industrial	Park Garden	Heath	Fen	Cattle Grazed	Bank Fenced
<b>Pollution:</b>	<b>Unpolluted</b>			Domestic			Agriculture			Industrial			
<b>Weed Control:</b>	Mechanical			Chemical			<b>None</b>						
<b>Disturbance Factor 1-5</b>	<b>1 (low)</b>		2		3		4		5 (high)				

Results Overview: Including details of field sign, count and National Grid Reference Numbers

Water Vole	Otter	Other Species (Mink and Rat)	Vegetation Types	DAFORN Rating
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings	Bankside Trees	N
<input type="checkbox"/> Latrines	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat	Bankside Bushes	N
<input checked="" type="checkbox"/> Burrows – 1 SE 81837 12013		<input type="checkbox"/> Mink Footprints/Runs	Bankside Herbs	O
<input type="checkbox"/> Footprints	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Rat Sightings	Submerged Weed	N
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings	Floating Weed	N
<input checked="" type="checkbox"/> Feeding Remains - 1 SE 81837 12013	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Footprints	Emergents	N
<input type="checkbox"/> Lawns			Marginals – Reeds/Sedges/Rushes	D
			Bankside Grasses	D

<b>Watercourse Number:</b>	Drain 5	<b>Date of Survey:</b>	19/05/2020
<b>Grid Reference Start:</b>	SE 82224 12179	<b>Grid Reference Finished:</b>	SE 82228 12091
<b>Further Notes:</b>			

<b>Watercourse Information (results in bold and italics):</b>																		
<b>Habitat Type:</b>	Coast		Lake		Pond		Main River		Stream		<b>Ditch</b>		Canal		Bog/Marsh			
<b>Shore Type:</b>	Boulders	Stones	Gravel	Sand	Silt	<b>Earth</b>	Rock Cliffs	Earth Cliffs	Canalized	Poached	Reinforced							
<b>Current:</b>	<b>Dry</b>			Fast		Slow			Sluggish			Static						
<b>Width:</b>	<1m		<b>1-2m</b>		2-5m		5-10m		10-20m		20-40m		>40m					
<b>Mean Water Depth:</b>	<b>Dry</b>			<0.5m			0.5-1m			1-2m								
<b>Bank Treatment:</b>	Canalised				Maintained				<b>Wild/Semi-Natural</b>									
<b>Bank Profile</b>	Flat <10°				Shallow <45°				<b>Steep &gt;45°</b>				Vertical/Undercut					
<b>Bank-full Height</b>	<0.5m			0.5-1m			<b>1-2m</b>			>2m								
<b>Water Use:</b>	Water Abstraction		Power Boating		Sail Boating		Manpower Boating		Bankside Angling		Bankside Shooting		Keepereed		Reserve		<b>None</b>	
<b>Bordering Land Use:</b>	Upland Grass	<b>Permanent/Temporary Grass</b>	Broad-leaved Woodland	Conifer Woodland	Peat Bog	Arable	Salt Marsh	Urban Industrial	Park Garden	Heath	Fen	Cattle Grazed	Bank Fenced					
<b>Pollution:</b>	<b>Unpolluted</b>				Domestic				Agriculture				Industrial					
<b>Weed Control:</b>	Mechanical				Chemical				<b>None</b>									
<b>Disturbance Factor 1-5</b>	<b>1 (low)</b>			2			3			4			5 (high)					

Results Overview: Including details of field sign, count and National Grid Reference Numbers

<b>Water Vole</b>	<b>Otter</b>	<b>Other Species (Mink and Rat)</b>	<b>Vegetation Types</b>	<b>DAFORN Rating</b>
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings	Bankside Trees	N
<input type="checkbox"/> Latrines	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat	Bankside Bushes	N
<input type="checkbox"/> Burrows		<input type="checkbox"/> Mink Footprints/Runs	Bankside Herbs	O
<input type="checkbox"/> Footprints	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Rat Sightings	Submerged Weed	N
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings	Floating Weed	N
<input type="checkbox"/> Feeding Remains	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Footprints	Emergents	O
<input type="checkbox"/> Lawns			Marginals – Reeds/Sedges/Rushes	D
			Bankside Grasses	D

<b>Watercourse Number:</b>	Drain 5	<b>Date of Survey:</b>	12/08/2020
<b>Grid Reference Start:</b>	SE 82224 12179	<b>Grid Reference Finished:</b>	SE 82228 12091
<b>Further Notes:</b>			
<i>Watercourse Information (results in bold and italics):</i>			
<b>Habitat Type:</b>	Coast	Lake	Pond
<b>Shore Type:</b>	Boulders	Stones	Gravel
<b>Current:</b>	<b>Dry</b>	Fast	Slow
<b>Width:</b>	<1m	<b>1-2m</b>	2-5m
<b>Mean Water Depth:</b>	<b>Dry</b>	<0.5m	0.5-1m
<b>Bank Treatment:</b>	Canalised	Maintained	<b>Wild/Semi-Natural</b>
<b>Bank Profile:</b>	Flat <10°	Shallow <45°	<b>Steep &gt;45°</b>
<b>Bank-full Height:</b>	<0.5m	0.5-1m	<b>1-2m</b>
<b>Water Use:</b>	Water Abstraction	Power Boating	Sail Boating
<b>Bordering Land Use:</b>	Upland Grass	<b>Permanent/Temporary Grass</b>	Broad-leaved Woodland
<b>Pollution:</b>	<b>Unpolluted</b>	Domestic	Agriculture
<b>Weed Control:</b>	Mechanical	Chemical	<b>None</b>
<b>Disturbance Factor 1-5</b>	<b>1 (low)</b>	2	3

Results Overview: Including details of field sign, count and National Grid Reference Numbers

Water Vole	Otter	Other Species (Mink and Rat)	Vegetation Types	DAFORN Rating
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings	Bankside Trees	N
<input type="checkbox"/> Latrines	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat	Bankside Bushes	N
<input type="checkbox"/> Burrows		<input type="checkbox"/> Mink Footprints/Runs	Bankside Herbs	O
<input type="checkbox"/> Footprints	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Rat Sightings	Submerged Weed	N
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings	Floating Weed	N
<input type="checkbox"/> Feeding Remains	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Footprints	Emergents	O
<input type="checkbox"/> Lawns			Marginals – Reeds/Sedges/Rushes	D
			Bankside Grasses	D

<b>Watercourse Number:</b>	North Soak Drain	Date of Survey:	12/08/2020
Grid Reference Start:	SE 82516 11544	Grid Reference Finished:	SE 82747 11508
Further Notes: The water was too deep to survey from the within the <u>channel</u> so surveys were conducted from the bank.			

**Watercourse Information (results in bold and italics):**

Habitat Type:	Coast	Lake	Pond	Main River	Stream	<b>Ditch</b>	Canal	Bog/Marsh					
Shore Type:	Boulders	Stones	Gravel	Sand	Silt	<b>Earth</b>	Rock Cliffs	Earth Cliffs	Canalized	Poached	Reinforced		
Current:	Dry		Fast	Slow		Sluggish		<b>Static</b>					
Width:	<1m	1-2m	2-5m	5-10m	<b>10-20m</b>		20-40m	>40m					
Mean Water Depth:	Dry		<0.5m		0.5-1m		> 1m						
Bank Treatment:	Canalised			Maintained			<b>Wild/Semi-Natural</b>						
Bank Profile	Flat <10°			Shallow <45°		<b>Steep &gt;45°</b>		Vertical/Undercut					
Bank-full Height	<0.5m		0.5-1m		<b>1-2m</b>		>2m						
Water Use:	Water Abstraction	Power Boating	Sail Boating	Manpower Boating	Bankside Angling	Bankside Shooting	Keepereed	Reserve	<b>None</b>				
Bordering Land Use:	Upland Grass	<b>Permanent /Temporary Grass</b>	Broad-leaved Woodland	Conifer Woodland	Peat Bog	Arable	Salt Marsh	Urban Industrial	Park Garden	Heath	Fen	Cattle Grazed	Bank Fenced
Pollution:	<b>Unpolluted</b>			Domestic			Agriculture			Industrial			
Weed Control:	Mechanical			Chemical			<b>None</b>						
Disturbance Factor 1-5	1 (low)		2		3		4		5 (high)				

Results Overview: Including details of field sign, count and National Grid Reference Numbers

Water Vole	Otter	Other Species (Mink and Rat)
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings
<input type="checkbox"/> Latrines	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat
<input type="checkbox"/> Burrows		<input type="checkbox"/> Mink Footprints/Runs
<input type="checkbox"/> Footprints	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Rat Sightings
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings
<input type="checkbox"/> Feeding Remains	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Footprints
<input type="checkbox"/> Lawns		

Vegetation Types	DAFORN Rating
Bankside Trees	N
Bankside Bushes	D
Bankside Herbs	F
Submerged Weed	O
Floating Weed	N
Emergents	R
Marginals – Reeds/Sedges/Rushes	R
Bankside Grasses	A

<b>Watercourse Number:</b>	Hatfield Drain	<b>Date of Survey:</b>	20/10/2020
<b>Grid Reference Start:</b>	SE 80421 10012	<b>Grid Reference Finished:</b>	SE 80149 10057
<b>Further Notes:</b>			

*Watercourse Information (results in bold and italics):*

<b>Habitat Type:</b>	Coast	Lake	Pond	Main River	Stream	Ditch	Canal	Bog/Marsh					
<b>Shore Type:</b>	Boulders	Stones	Gravel	Sand	Silt	Earth	Rock Cliffs	Earth Cliffs	Canalized	Poached	Reinforced		
<b>Current:</b>	Rapid		Fast		Slow		Sluggish		<b>Static</b>				
<b>Width:</b>	<1m	1-2m	2-5m	<b>5-10m</b>		10-20m	20-40m	>40m					
<b>Mean Water Depth:</b>	<0.5m		<b>0.5-1m</b>			1-2m		>2m					
<b>Bank Treatment:</b>	Canalised			Maintained				<b>Wild/Semi-Natural</b>					
<b>Bank Profile</b>	Flat <10°			<b>Shallow &lt;45°</b>			Steep >45°		Vertical/Undercut				
<b>Bank-full Height</b>	<0.5m		0.5-1m			1-2m		>2m					
<b>Water Use:</b>	Water Abstraction	Power Boating	Sail Boating	Manpower Boating	Bankside Angling	Bankside Shooting	Keepereed	Reserve	<b>None</b>				
<b>Bordering Land Use:</b>	Upland Grass	<b>Permanent /Temporary Grass</b>	Broad-leaved Woodland	Conifer Woodland	Peat Bog	<b>Arable</b>	Salt Marsh	Urban Industrial	Park Garden	Heath	Fen	Cattle Grazed	Bank Fenced
<b>Pollution:</b>	Unpolluted			Domestic			<b>Agriculture</b>			<u>Industrial</u>			
<b>Weed Control:</b>	Mechanical				Chemical				<b>None</b>				
<b>Disturbance Factor 1-5</b>	1 (low)		2		3		4		5 (high)				

*Results Overview: Including details of field sign, count and National Grid Reference Numbers*

<b>Water Vole</b>	<b>Otter</b>	<b>Other Species (Mink and Rat)</b>	<b>Vegetation Types</b>	<b>DAFORN Rating</b>
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings	Bankside Trees	R
<input type="checkbox"/> Latrines	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat	Bankside Bushes	R
<input type="checkbox"/> Burrows		<input type="checkbox"/> Mink Footprints/Runs	Bankside Herbs	O
<input type="checkbox"/> Footprints	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Rat Sightings	Submerged Weed	R
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings	Floating Weed	R
<input type="checkbox"/> Feeding Remains	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Footprints	Emergents	R
<input type="checkbox"/> Lawns			Marginals – Reeds/Sedges/Rushes	A
			Bankside Grasses	F

<b>Watercourse Number:</b>	Keadby Common Drain	<b>Date of Survey:</b>	20/10/2020
<b>Grid Reference Start:</b>	SE 82893 11941	<b>Grid Reference Finished:</b>	SE 82701 11983
<b>Further Notes:</b>			

**Watercourse Information (results in bold and italics):**

<b>Habitat Type:</b>	Coast	Lake	Pond	Main River	Stream	<b>Ditch</b>	Canal	Bog/Marsh					
<b>Shore Type:</b>	Boulders	Stones	Gravel	Sand	Silt	<b>Earth</b>	Rock Cliffs	Earth Cliffs	Canalized	Poached	Reinforced		
<b>Current:</b>	Rapid		Fast	Slow		Sluggish		<b>Static</b>					
<b>Width:</b>	<1m	<b>1-2m</b>	2-5m	5-10m	10-20m	20-40m	>40m						
<b>Mean Water Depth:</b>	<b>&lt;0.5m</b>		0.5-1m		1-2m		>2m						
<b>Bank Treatment:</b>	Canalised			Maintained			<b>Wild/Semi-Natural</b>						
<b>Bank Profile</b>	Flat <10°			Shallow <45°		<b>Steep &gt;45°</b>		Vertical/Undercut					
<b>Bank-full Height</b>	<0.5m			0.5-1m		<b>1-2m</b>		>2m					
<b>Water Use:</b>	Water Abstraction	Power Boating	Sail Boating	Manpower Boating	Bankside Angling	Bankside Shooting	Keepereed	Reserve	<b>None</b>				
<b>Bordering Land Use:</b>	Upland Grass	<u>Permanent/Temporary Grass</u>	Broad-leaved Woodland	Conifer Woodland	Peat Bog	<b>Arable</b>	Salt Marsh	Urban Industrial	Park Garden	Heath	Fen	Cattle Grazed	Bank Fenced
<b>Pollution:</b>	Unpolluted			Domestic		<b>Agriculture</b>			<u>Industrial</u>				
<b>Weed Control:</b>	Mechanical			Chemical			<b>None</b>						
<b>Disturbance Factor 1-5</b>	1 (low)		<b>2</b>		3		4		5 (high)				

**Results Overview:** Including details of field sign, count and National Grid Reference Numbers

<b>Water Vole</b>	<b>Otter</b>	<b>Other Species (Mink and Rat)</b>	<b>Vegetation Types</b>	<b>DAFORN Rating</b>
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings	Bankside Trees	N
<input checked="" type="checkbox"/> <b>Latrines</b> – SE 82762 11971, SE 82785 11970, SE 82797 11967, SE 82815 11959, SE 82834 11961	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat	Bankside Bushes	N
<input checked="" type="checkbox"/> <b>Burrows</b> – SE 82785 11970, SE 82797 11967, SE 82834 11961	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Mink Footprints/Runs	Bankside Herbs	A
<input type="checkbox"/> Footprints	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Rat Sightings	Submerged Weed	F
<input type="checkbox"/> Pathways	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Droppings	Floating Weed	F
<input checked="" type="checkbox"/> Feeding Remains		<input type="checkbox"/> Rat Footprints	Emergents	O
<input type="checkbox"/> Lawns			Marginals –	R
			Reeds/Sedges/Rushes	
			Bankside Grasses	A



<b>Watercourse Number:</b>	Ditch 7a	<b>Date of Survey:</b>	20/10/2020
<b>Grid Reference Start:</b>	SE 80665 11039	<b>Grid Reference Finished:</b>	SE 80647 10912
<b>Further Notes:</b>			

*Watercourse Information (results in bold and italics):*

<b>Habitat Type:</b>	Coast	Lake	Pond	Main River	Stream	<b>Ditch</b>	Canal	Bog/Marsh					
<b>Shore Type:</b>	Boulders	Stones	Gravel	Sand	Silt	<b>Earth</b>	Rock Cliffs	Earth Cliffs	Canalized	Poached	Reinforced		
<b>Current:</b>	Rapid		Fast	Slow		Sluggish		Static					
<b>Width:</b>	<1m	<b>1-2m</b>	2-5m	5-10m	10-20m	20-40m	>40m						
<b>Mean Water Depth:</b>	<0.5m		0.5-1m	1-2m		>2m							
<b>Bank Treatment:</b>	Canalised			Maintained			Wild/Semi-Natural						
<b>Bank Profile</b>	Flat <10°		<b>Shallow &lt;45°</b>			Steep >45°		Vertical/Undercut					
<b>Bank-full Height</b>	<0.5m		0.5-1m		<b>1-2m</b>		>2m						
<b>Water Use:</b>	Water Abstraction	Power Boating	Sail Boating	Manpower Boating	Bankside Angling	Bankside Shooting	Keeperead	Reserve	None				
<b>Bordering Land Use:</b>	Upland Grass	<u>Permanent</u> Temporary Grass	Broad-leaved Woodland	Conifer Woodland	Peat Bog	Arable	Salt Marsh	Urban Industrial	Park Garden	Heath	Fen	Cattle Grazed	Bank Fenced
<b>Pollution:</b>	Unpolluted			Domestic			<b>Agriculture</b>			<u>Industrial</u>			
<b>Weed Control:</b>	Mechanical			Chemical			None						
<b>Disturbance Factor 1-5</b>	1 (low)		<b>2</b>		3		4		5 (high)				

*Results Overview: Including details of field sign, count and National Grid Reference Numbers*

<b>Water Vole</b>	<b>Otter</b>	<b>Other Species (Mink and Rat)</b>	<b>Vegetation Types</b>	<b>DAFORN Rating</b>
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings	Bankside Trees	N
<input type="checkbox"/> Latrines	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat	Bankside Bushes	N
<input type="checkbox"/> Burrows		<input type="checkbox"/> Mink Footprints/Runs	Bankside Herbs	O
<input type="checkbox"/> Footprints	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Rat Sightings	Submerged Weed	N
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings	Floating Weed	N
<input type="checkbox"/> Feeding Remains	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Footprints	Emergents	O
<input type="checkbox"/> Lawns			Marginals –	R
			Reeds/Sedges/Rushes	
			Bankside Grasses	A

<b>Watercourse Number:</b>	Ditch 7b	Date of Survey:	20/10/2020
Grid Reference Start:	SE 80896 11177	Grid Reference Finished:	SE 80874 10866
Further Notes:			

**Watercourse Information (results in bold and italics):**

Habitat Type:	Coast	Lake	Pond	Main River	Stream	<b>Ditch</b>	Canal	Bog/Marsh					
Shore Type:	Boulders	Stones	Gravel	Sand	Silt	<b>Earth</b>	Rock Cliffs	Earth Cliffs	Canalized	Poached	Reinforced		
Current:	Rapid		Fast	Slow		Sluggish		<b>Static</b>					
Width:	<1m	<b>1-2m</b>	2-5m	5-10m	10-20m	20-40m	>40m						
Mean Water Depth:	<b>&lt;0.5m</b>		0.5-1m		1-2m		>2m						
Bank Treatment:	Canalised			Maintained			<b>Wild/Semi-Natural</b>						
Bank Profile	Flat <10°		<b>Shallow &lt;45°</b>			Steep >45°		Vertical/Undercut					
Bank-full Height	<0.5m		<b>0.5-1m</b>			1-2m		>2m					
Water Use:	Water Abstraction	Power Boating	Sail Boating	Manpower Boating	Bankside Angling	Bankside Shooting	Keeped	Reserve	<b>None</b>				
Bordering Land Use:	Upland Grass	<u>Permanent</u> Temporary Grass	Broad-leaved Woodland	Conifer Woodland	Peat Bog	<b>Arable</b>	Salt Marsh	Urban Industrial	Park Garden	Heath	Fen	Cattle Grazed	Bank Fenced
Pollution:	Unpolluted			Domestic			<b>Agriculture</b>			Industrial			
Weed Control:	Mechanical				Chemical				<b>None</b>				
Disturbance Factor 1-5	1 (low)		<b>2</b>		3		4		5 (high)				

**Results Overview:** Including details of field sign, count and National Grid Reference Numbers

Water Vole	Otter	Other Species (Mink and Rat)	Vegetation Types	DAFORN Rating
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings	Bankside Trees	N
<input type="checkbox"/> Latrines	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat	Bankside Bushes	N
<input type="checkbox"/> Burrows		<input type="checkbox"/> Mink Footprints/Runs	Bankside Herbs	O
<input type="checkbox"/> Footprints	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Rat Sightings	Submerged Weed	N
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings	Floating Weed	N
<input type="checkbox"/> Feeding Remains	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Footprints	Emergents	N
<input type="checkbox"/> Lawns			Marginals – Reeds/Sedges/Rushes	R
			Bankside Grasses	A

<b>Watercourse Number:</b>	Ditch 7c	Date of Survey:	20/10/2020
Grid Reference Start:	SE 81018 10835	Grid Reference Finished:	SE 81070 11198
Further Notes:			

**Watercourse Information (results in bold and italics):**

Habitat Type:	Coast	Lake	Pond	Main River	Stream	<b>Ditch</b>	Canal	Bog/Marsh					
Shore Type:	Boulders	Stones	Gravel	Sand	Silt	<b>Earth</b>	Rock Cliffs	Earth Cliffs	Canalized	Poached	Reinforced		
Current:	Rapid		Fast	Slow		Sluggish		<b>Static</b>					
Width:	<1m	<b>1-2m</b>	2-5m	5-10m	10-20m	20-40m	>40m						
Mean Water Depth:	<b>&lt;0.5m</b>		0.5-1m	1-2m		>2m							
Bank Treatment:	Canalised			Maintained			<b>Wild/Semi-Natural</b>						
Bank Profile:	Flat <10°		<b>Shallow &lt;45°</b>			Steep >45°		Vertical/Undercut					
Bank-full Height:	<0.5m		<b>0.5-1m</b>		1-2m		>2m						
Water Use:	Water Abstraction	Power Boating	Sail Boating	Manpower Boating	Bankside Angling	Bankside Shooting	Keeperved	Reserve	<b>None</b>				
Bordering Land Use:	Upland Grass	<u>Permanent</u> /Temporary Grass	Broad-leaved Woodland	Conifer Woodland	Peat Bog	<b>Arable</b>	Salt Marsh	Urban Industrial	Park Garden	Heath	Fen	Cattle Grazed	Bank Fenced
Pollution:	Unpolluted			Domestic			<b>Agriculture</b>			Industrial			
Weed Control:	Mechanical				Chemical				<b>None</b>				
Disturbance Factor 1-5	1 (low)		<b>2</b>		3		4		5 (high)				

**Results Overview:** Including details of field sign, count and National Grid Reference Numbers

Water Vole	Otter	Other Species (Mink and Rat)	Vegetation Types	DAFORN Rating
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings	Bankside Trees	N
<input type="checkbox"/> Latrines	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat	Bankside Bushes	N
<input type="checkbox"/> Burrows		<input type="checkbox"/> Mink Footprints/Runs	Bankside Herbs	O
<input type="checkbox"/> Footprints	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Rat Sightings	Submerged Weed	N
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings	Floating Weed	N
<input type="checkbox"/> Feeding Remains	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Footprints	Emergents	N
<input type="checkbox"/> Lawns			Marginals – Reeds/Sedges/Rushes	R
			Bankside Grasses	A

<b>Watercourse Number:</b>	Ditch 8	Date of Survey:	20/10/2020
Grid Reference Start:	SE 80457 10935	Grid Reference Finished:	SE 80643 10907
Further Notes:			

**Watercourse Information (results in bold and italics):**

Habitat Type:	Coast	Lake	Pond	Main River	Stream	<b>Ditch</b>	Canal	Bog/Marsh					
Shore Type:	Boulders	Stones	Gravel	Sand	Silt	<b>Earth</b>	Rock Cliffs	Earth Cliffs	Canalized	Poached	Reinforced		
Current:	Rapid		Fast	Slow		Sluggish		<b>Static</b>					
Width:	<1m	<b>1-2m</b>	2-5m	5-10m	10-20m	20-40m	>40m						
Mean Water Depth:	<b>&lt;0.5m</b>		0.5-1m	1-2m		>2m							
Bank Treatment:	Canalised			Maintained			<b>Wild/Semi-Natural</b>						
Bank Profile	Flat <10°		Shallow <45°		<b>Steep &gt;45°</b>		Vertical/Undercut						
Bank-full Height	<0.5m		<b>0.5-1m</b>		1-2m		>2m						
Water Use:	Water Abstraction	Power Boating	Sail Boating	Manpower Boating	Bankside Angling	Bankside Shooting	Kepered	Reserve	<b>None</b>				
Bordering Land Use:	Upland Grass	<u>Permanent</u> Temporary Grass	Broad-leaved Woodland	Conifer Woodland	Peat Bog	<b>Arable</b>	Salt Marsh	Urban Industrial	Park Garden	Heath	Fen	Cattle Grazed	Bank Fenced
Pollution:	Unpolluted			Domestic		<b>Agriculture</b>			Industrial				
Weed Control:	Mechanical			Chemical			<b>None</b>						
Disturbance Factor 1-5	1 (low)		<b>2</b>		3		4		5 (high)				

**Results Overview:** Including details of field sign, count and National Grid Reference Numbers

Water Vole	Otter	Other Species (Mink and Rat)
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings
<input type="checkbox"/> Latrines	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat
<input type="checkbox"/> Burrows		<input type="checkbox"/> Mink Footprints/Runs
<input type="checkbox"/> Footprints	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Rat Sightings
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings
<input type="checkbox"/> Feeding Remains	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Footprints
<input type="checkbox"/> Lawns		

Vegetation Types	DAFORN Rating
Bankside Trees	N
Bankside Bushes	N
Bankside Herbs	N
Submerged Weed	N
Floating Weed	N
Emergents	N
Marginals – Reeds/Sedges/Rushes	N
Bankside Grasses	A

<b>Watercourse Number:</b>	Ditch 9	Date of Survey:	20/10/2020
Grid Reference Start:	SE 80656 10904	Grid Reference Finished:	SE 80861 10869
Further Notes:			

**Watercourse Information (results in bold and italics):**

Habitat Type:	Coast	Lake	Pond	Main River	Stream	<b>Ditch</b>	Canal	Bog/Marsh					
Shore Type:	Boulders	Stones	Gravel	Sand	Silt	<b>Earth</b>	Rock Cliffs	Earth Cliffs	Canalized	Poached	Reinforced		
Current:	Rapid		Fast		Slow		Sluggish		<b>Static</b>				
Width:	<1m	<b>1-2m</b>		2-5m	5-10m		10-20m	20-40m	>40m				
Mean Water Depth:	<0.5m		<b>0.5-1m</b>			1-2m		>2m					
Bank Treatment:	Canalised			Maintained				<b>Wild/Semi-Natural</b>					
Bank Profile:	Flat <10°			Shallow <45°			<b>Steep &gt;45°</b>		Vertical/Undercut				
Bank-full Height:	<0.5m			0.5-1m			<b>1-2m</b>		>2m				
Water Use:	Water Abstraction	Power Boating	Sail Boating	Manpower Boating	Bankside Angling	Bankside Shooting	Keeped	Reserve	<b>None</b>				
Bordering Land Use:	Upland Grass	<u>Permanent</u> (Temporary Grass)	Broad-leaved Woodland	Conifer Woodland	Peat Bog	<b>Arable</b>	Salt Marsh	Urban Industrial	Park Garden	Heath	Fen	Cattle Grazed	Bank Fenced
Pollution:	Unpolluted			Domestic			<b>Agriculture</b>			Industrial			
Weed Control:	<b>Mechanical</b>				Chemical				None				
Disturbance Factor 1-5	1 (low)		2		3		4		5 (high)				

Results Overview: Including details of field sign, count and National Grid Reference Numbers

Water Vole	Otter	Other Species (Mink and Rat)	Vegetation Types	DAFORN Rating
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings	Bankside Trees	N
<input type="checkbox"/> Latrines	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat	Bankside Bushes	N
<input type="checkbox"/> Burrows		<input type="checkbox"/> Mink Footprints/Runs	Bankside Herbs	O
<input type="checkbox"/> Footprints	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Rat Sightings	Submerged Weed	R
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings	Floating Weed	R
<input type="checkbox"/> Feeding Remains	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Footprints	Emergents	O
<input type="checkbox"/> Lawns			Marginals – Reeds/Sedges/Rushes	O
			Bankside Grasses	A

<b>Watercourse Number:</b>	Ditch 10	Date of Survey:	20/10/2020
Grid Reference Start:	SE 81073 11220	Grid Reference Finished:	SE 82101 11326
Further Notes:			

**Watercourse Information (results in bold and italics):**

Habitat Type:	Coast	Lake	Pond	Main River	Stream	<b>Ditch</b>	Canal	Bog/Marsh					
Shore Type:	Boulders	Stones	Gravel	Sand	Silt	<b>Earth</b>	Rock Cliffs	Earth Cliffs	Canalized	Poached	Reinforced		
Current:	Rapid		Fast	Slow		Sluggish		<b>Static</b>					
Width:	<1m	<b>1-2m</b>	2-5m	5-10m	10-20m	20-40m	>40m						
Mean Water Depth:	<0.5m		<b>0.5-1m</b>		1-2m		>2m						
Bank Treatment:	Canalised			<b>Maintained</b>				Wild/Semi-Natural					
Bank Profile	Flat <10°		Shallow <45°		<b>Steep &gt;45°</b>		Vertical/Undercut						
Bank-full Height	<0.5m		0.5-1m		<b>1-2m</b>		>2m						
Water Use:	Water Abstraction	Power Boating	Sail Boating	Manpower Boating	Bankside Angling	Bankside Shooting	Keeped	Reserve	<b>None</b>				
Bordering Land Use:	Upland Grass	<u>Permanent</u> /Temporary Grass	Broad-leaved Woodland	Conifer Woodland	Peat Bog	<b>Arable</b>	Salt Marsh	Urban Industrial	Park Garden	Heath	Fen	Cattle Grazed	Bank Fenced
Pollution:	Unpolluted			Domestic		<b>Agriculture</b>			Industrial				
Weed Control:	<b>Mechanical</b>				Chemical			None					
Disturbance Factor 1-5	1 (low)		2		3		4		5 (high)				

**Results Overview:** Including details of field sign, count and National Grid Reference Numbers

Water Vole	Otter	Other Species (Mink and Rat)	Vegetation Types	DAFORN Rating
<input type="checkbox"/> Sightings	<input type="checkbox"/> Sightings	<input type="checkbox"/> Mink Sightings	Bankside Trees	N
<input type="checkbox"/> Latrines	<input type="checkbox"/> Spraint	<input type="checkbox"/> Mink Scat	Bankside Bushes	N
<input type="checkbox"/> Burrows		<input type="checkbox"/> Mink Footprints/Runs	Bankside Herbs	O
<input type="checkbox"/> Footprints	<input type="checkbox"/> Footprints/Runs	<input type="checkbox"/> Rat Sightings	Submerged Weed	R
<input type="checkbox"/> Pathways		<input type="checkbox"/> Rat Droppings	Floating Weed	O
<input type="checkbox"/> Feeding Remains	<input type="checkbox"/> Holts/couches	<input type="checkbox"/> Rat Footprints	Emergents	R
<input type="checkbox"/> Lawns			Marginals – Reeds/Sedges/Rushes	R
			Bankside Grasses	A

## ANNEX B PHOTOGRAPHS



**Photograph 1 - Drain 1 (Glew Drain)**



**Photograph 2 - Drain 2, western section**



**Photograph 3 - Drain 2, eastern section**



**Photograph 4 - Drain 3**





**Photograph 5 – Drain 4**



**Photograph 6 – Drain 5**



**Photograph 7 – North Soak Drain**



**Photograph 8 – Stainforth and Keadby Canal**



**Photograph 9 – River Trent**



**Photograph 10 – Hatfield Waste Drain**



**Photograph 11 – Keadby Common Drain adjacent to Chapel Lane, Keadby**



**Photograph 12 – Drain 7a**



**Photograph 13 – Drain 7b**



**Photograph 14 – Drain 7c**



**Photograph 15 – Drain 8**





**Photograph 16 – Drain 9**



**Photograph 17 – Drain 10**



**Photograph 18 – Area of woodland cleared for construction of the Keadby 2 Power Station water intake on the Stainforth and Keadby Canal**



**Photograph 19 – Aerial view of the construction area for the Keadby 2 Power Station water intake on the Stainforth and Keadby Canal, drone footage taken November 2020**