Phase II Reptile Report: Gateway Energy Centre Gas Pipeline & Electricity Cabling Routes

InterGen

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PARSONS BRINCKERHOFF

PB 125 YEARS

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Parsons Brinckerhoff Ltd (PB) has been commissioned by InterGen to undertake a detailed reptile population and distribution survey south and east of Stanford-le-Hope, Essex to inform the construction of the proposed gas pipeline and associated AGI / electrical connection and sub-station associated with the Gateway Energy Centre Combined Cycle Gas Turbine (CCGT) Power Station (GEC).

The exact alignment / routes and locations of the proposed gas pipeline and associated AGI / electrical connection and sub-station have yet to be finalised. However, the indicative alignment / routes and locations have been established and form the basis of this assessment. The survey area encompasses a 250 m buffer either side of an indicative approximate 7.7 km long gas pipeline and 6 km long electrical connection. The survey area is situated between TQ 677 810 and TQ 732 817. The habitat is dominated by arable, grazing marsh, ruderal vegetation and brownfield sites. Suitable reptile habitat is present throughout.

The objective of the assessment was to document the distribution and estimate the population of reptiles located within the survey area

Ecology Services Limited and Cambridge Ecology completed reptile surveys to inform the LG Development in 2006 / 2007, with more recent surveys being undertaken by Thomson Ecology in 2008 / 2009. A large proportion of the survey area for this assessment has been previously surveyed by Thomson Ecology in 2008 / 2009. It is therefore considered that much of the data collected by Thomson Ecology is relevant to this assessment. As such, it has been possible to use some of the data previously collected by Thomson Ecology to form the baseline of this report. Any large gaps in the baseline were supplemented by new reptile surveys undertaken by PB in 2010.

Four species of reptile; common lizard, slow worm, adder and grass snake, were recorded in medium to high populations throughout the survey area. Particularly large populations of all four species were recorded north of the A1014 (The Manorway).

Due to the temporary nature of the proposed development and the narrow footprint area, it is considered that the reptile population will not be significantly adversely affected by the proposed development. The construction of the sub-station (associated with the electrical connection) is likely to result in permanent land-take. Sub-station option 5b is located in an area of land dominated by brown field habitat and is considered to be of high conservation value for reptiles. However, sub-station options 1 and 5a are both located within areas of sub-optimal reptile habitat and are considered to have a negligible impact on reptiles.

Under the current plans it is likely that the gas pipeline would bisect optimum habitat for reptiles as well as potentially killing and / or injuring reptiles, which would be illegal under the Wildlife and Countryside Act 1981 (as amended). Measures have therefore been recommended to avoid and mitigate these direct impacts and ensure legal compliance.

It is recommended the routes of the gas pipeline and electrical connection are designed to avoid as much optimum habitat as possible. Second to this, the manipulation of suitable habitat would temporarily excluded reptiles from the working width by encouraging them to natural move off site. Habitat Manipulation should be undertaken prior to any the commencement of any construction works. It maybe necessary to erect reptile exclusion fencing along certain sections of the survey area, particularly where the pipeline will bisect established reptile commuting corridors. The requirement for such fencing should be confirmed following the agreement of the final alignment. A reptile translocation maybe also required if sub-station option 5b is chosen as the site is known to support reptiles and is dominated by habitat considered to be exceptional for this species group.

The applicability of each mitigation technique, particularly the potential reptile translocation will require detailed consideration and consultation / approval with Natural England. It is recommended that such consultation commences once preferred routes and locations have been agreed.

SECTION 1

INTRODUCTION

1 INTRODUCTION

1.1 Overview

1.1.1 Parsons Brinckerhoff Ltd (PB) was commissioned by InterGen to undertake a detailed reptile population and distribution assessment, south and east of Stanford-le-Hope, Essex. . The assessment will inform the construction of the proposed gas pipeline and associated AGI / electrical connection and sub-station associated with the Gateway Energy Centre Combined Cycle Gas Turbine (CCGT) Power Station (GEC).

1.1.2 It was identified within the Ecological Scoping Assessment (PB 2010) that reptile surveys should be undertaken within all habitats which could be affected by the proposed development and could potentially support reptiles. The surveys were designed to establish the reptile species present, their distributions and populations across the survey area to ensure compliance with the relevant species legislation.

1.1.3 Detailed reptile surveys were undertaken across in 2006, 2007 and 2008 as part of the adjacent London Gateway (LG) Development. The most recent surveys completed by Thomson Ecology in 2008 are still considered to be valid and have been used to inform much of this assessment.

1.1.4 This report collates the 2008 data with the 2010 data, collected by PB, to determine the potential impact the proposed development may have on the local and regional reptile population and proposes mitigation measures where necessary.

1.2 Site Context

1.1.1 GEC will be location on land within the LG Development.

1.1.2 The GEC site is situated on the north bank of the Thames Estuary and lies approximately 6 km east of the A13. The A1014 dual carriageway (The Manorway) is located to the north of the site and runs east to west to provide a link with the A13, which in turn links in with the M25 at Junction 30. The River Thames runs in a west to east direction to the south of the site where DP World has recently commenced works on the new port facility associated with the LG Development.

1.1.3 The nearest residential settlements to the GEC site are at Stanford-le-Hope, Corringham and Fobbing which lie approximately 4 km to the west, Canvey Island approximately 5 km to the east, and Basildon approximately 7 km to the north.

1.1.4 To the east of the GEC site is the existing Coryton CCGT Power Station (700 m east), Shell Aviation Fuel Storage Farm and Petroplus' Coryton Oil Refinery (950 m east).

1.1.5 The LG Development comprises a deep-sea global container shipping port (LG Port) and a logistics and commercial centre (LG Logistics and Business Park). These are currently being developed on the site of the former Shell Oil Refinery at Shell Haven near Corringham and Stanford-le-Hope (Essex) on the northern banks of the Thames Estuary.

1.1.6 Prior to planning permission being granted, detailed ecological surveys were undertaken within the LG Development footprint and its immediate surroundings.

1.1.7 The underground gas pipeline and associated AGI are required to deliver the natural gas to be used as fuel by the gas turbines at GEC. At the AGI (OS Grid reference TQ 677 810), the natural gas will be taken from a connection to the existing National Grid National Transmission System (NTaS) Number 5 Feeder pipeline.

1.1.8 From the AGI, the underground gas pipeline will cross a range of arable, marsh and brownfield habitats and an area of land designated as a protected species receptor site for the LG Development, eventually connecting to GEC (OS Grid reference TQ 732 817) (see Figure 1). The underground gas pipeline will be laid using a combination of both surface excavation and horizontal directional drilling (HDD). The

plastic pipe is expected to measure approximately 16 inches in diameter and will be laid at a depth of approximately 1.2 m, using a working width of approximately 30 m where HDD is not used. Works are proposed to commence in either 2012 or 2013 and will take approximately six to nine months to complete.

1.1.9 If the electrical connection is over ground, it is likely to be fitted to new overhead pylons. It will run for approximately 6 km from GEC to a sub-station to be consented and constructed by National Grid. At the time of writing there are four possible sub-station locations, all situated to the west of the GEC site. All four possible locations have been included within this assessment (Figure 1). However, it should be noted, that a separate detailed assessment of the four sub-station locations, the inter-connecting cabling and all associated infrastructure is being undertaken independently of this assessment.

1.1.10 The exact alignment / routes and locations of the proposed gas pipeline and associated AGI / electrical connection and sub-station have yet to be finalised. However, the indicative alignment / routes and locations have been established and form the basis of this assessment. The indicative route for the gas pipeline and electricity connection will follow the alignment of an existing CECL Power Station gas pipeline as it is most likely that they will be laid as close to one another as possible to allow for easy management and maintenance. The 'proposed development' for the purposes of this Document therefore includes the gas pipeline and associated AGI / electrical connection and 4 preferred sub-stations.

1.2.1 Areas of suitable habitat for reptiles were found to be present within the LG Development in 2006 during a habitat suitability assessment carried out by Ecology Services Limited. Further reptile surveys were carried out in 2007 by Cambridge Ecology and by Thomson Ecology in 2008. Thomson Ecology surveyed all land within the LG Development boundary, an area of rail embankment to the west, and a large area of land to the south west of the site (known as Site A, a receptor site for wintering birds).

1.2.2 The majority of the indicative route is located outside but in close proximity to the LG Development and as such sections of the surveys area have already been surveyed for reptiles (Figure 2). Much of the data recently collated for the LG Development is therefore relevant to this assessment and has been used to form much of its baseline. Areas of suitable habitat that were not surveyed by Thomson Ecology have been surveyed and assessed by PB in 2010.

1.2.3 Due to the temporary nature of the proposed works and the comparatively thin 30 m working width it was not considered necessary to undertake a detailed reptile survey of the entire 11 km indicative route. Instead, the Thomson Ecology and PB surveys together, ensure that a range of intermittently spaced habitat suitable to support reptiles has been surveyed. This approach ensures that sufficiently detailed baseline data is collected to accurately inform the impact assessment and the subsequent mitigation across the whole survey area. A buffer of ~250 m either side of the indicative route has been used for this assessment to allow for any small scale variation in route alignment. This 500 m corridor is defined as the survey area.

1.2.4 The LG Development site contains a large number of water bodies and natural hibernacula such as old spoil heaps. However it is unlikely that reptiles will be present within the LG Development at the time of construction as the LG Development site is currently undergoing a large scale translocation programme to remove all reptiles from the site as recommended by the Reptile Ecological Action Plan (Thomson Ecology 2008). All reptiles will be moved into two designated receptor sites located in close proximity of the development, the Northern Triangle (east and west) and Great Garlands Farm Elbow Site, and two remote receptor sites

located in Wiltshire, Sandpool Farm, and Blakehill Farm. The two local receptor sites are located within the survey area (see Figure 2).

1.2.5 The translocation works recommended within Thomson's Reptile Action Plan commenced in 2008 and are planned to continue until the end of 2010, whereby all reptiles within the LG Development area should be captured, translocated and released at the secure receptor sites. Although the works have not yet been completed, data on the number of reptiles translocated to the receptor sites by May 2010 were made available. This report therefore takes the potential increases in reptile populations within the two local receptor sites into consideration.

1.3 Legislation and Planning Context

1.3.1 The four common UK reptile species, adder (Vipera berus), grass snake (Natrix natrix), common lizard (Zootoca vivipara) and slow worm (Anguis fragilis), are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) against deliberate and / or intentional killing, injuring and trade.

1.3.2 In addition, as European Protected Species, the less common smooth snake (Coronella austriaca) and sand lizard (Lacerta agilis) are fully protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010 (Habitat Regulations 2010). As a result it is an offence to intentionally kill, capture or injure these species, deliberately, intentionally or recklessly disturb these species, damage, destroy or obstruct a breeding site, resting place or other place used for shelter and protection, take or destroy eggs and to sell or trade in these species. However, the survey area does not fall in the distribution range for these two species.

1.3.3 All six UK reptile species are UK BAP species and adders and grass snakes are Local BAP priority species.

SECTION 2

METHODOLOGY

2 METHODOLOGY

2.1 Introduction

2.1.1 To facilitate the data analysis, the survey area was divided into nine distinct 'Areas'. Areas 1 to 6 were surveyed in 2010 by experienced ecologists from Parsons Brinckerhoff. Areas 7, 8, and 9, were surveyed in 2008 by Thomson Ecology. The boundaries of the nine areas are illustrated in Figure 1.

2.1.2 Reptiles are cold blooded, and therefore need to warm themselves by basking in sunshine. They tend to be found within proximity of dense vegetation, or lying beneath objects that conduct heat. Suitable reptile habitat is generally taken to include areas of tall ruderal vegetation, grassland, hedgerows, rough pasture, bogs and scattered areas of scrub as reptiles require habitats which support basking, shelter and foraging. Subsequently, all surveys were undertaken in optimum habitat using materials considered suitable to conduct heat and attract reptiles.

2.2 Desk Study

2.2.1 A desk study was undertaken in 2010 as part of the Ecological Scoping Report (PB, 2010) and information from previous surveys and desk studies, where relevant, were reviewed (Thomson 2008).

2.3 Field Survey

2.3.1 All surveys undertaken in 2010 by PB Ecologists were carried out using standard methodologies as recommended in the Herpetofauna Workers' Manual (JNCC, 2003) and the Draft Reptile Mitigation Guidance (Natural England 2010). The methodologies also acknowledge 'Froglife Advice Sheet 10', (Froglife 1999).

2.3.2 A total of 260 numbered artificial refugia comprising a mixture of 230 heavy bitumen roofing felts (~50x40 cm) and 30 corrugated roofing sheets (~100x60 cm) were placed at a density of 20-30 per hectare as recommended by Froglife (1999). The mats were laid out on the 20th May 2010 in areas 1, 2, 4, 5, and 6, and on the 4th June within Area 3. The refugia were only placed in habitats known to be preferred by reptiles (see 2.1.2), numbered and marked on a map to ensure no mats would be missed during the subsequent surveys. The refugia were left in-situ for a minimum of two weeks before the first visit to allow the vegetation to dry and for reptiles within the area to locate and become familiar with them.

2.3.3 Each survey area was visited on ten non-consecutive days between 17th May and 2nd July 2010. All visits were undertaken between 08.30 to 11.00 and 16.00 to 18.30 and during suitable weather conditions for basking reptiles (generally when the air temperature was between 10 and 20°C, and there was 'no rain' and 'intermittent sunshine') (Froglife 1999). The surveys undertaken for Area 3, the derelict fertiliser factory were undertaken between 18th June and 20th July due to limited access. During each visit, a visual survey of the area and each refugia was carried out first, whereby any naturally basking reptiles were noted before the area was surveyed and potentially disturbed. Each artificial refugia was checked in numerical order to ensure none were omitted. When each refugia had been surveyed from a far for any basking reptiles it was turned over to reveal any hidden reptiles.

2.3.4 The surveys were carried out on the 3rd, 4th, 8th, 11th, 14th, 16th, 18th, 22nd, 30th of June and the 2nd July, surveys of St Cleres Golf Course were only possible on the 17th, 26th May and 4th June, and surveys of Area 3 were limited to the 16th, 18th, 22nd, of June and 20th July only due to restricted access.

2.3.5 During each survey, the species, number of individuals, age class, refugia number and where possible the sex were recorded. The weather conditions and temperature during the visits were also noted.

2.3.6 Thomson Ecology undertook similar reptile surveys in 2008 which also followed standard methodologies (JNCC, 2003), whereby, artificial refugia were set out in suitable habitats and checked on seven separate occasions.

2.4 Habitat Suitability

2.4.1 The broad habitat types present throughout the survey area were assessed, categorised and mapped into areas of 'poor,' 'good,' or 'exceptional' reptile habitat adapted from the Draft Reptile Mitigation Guidance (Natural England 2010) (see Table 2.1).

TABLE 2.1: HABITAT SUITABILITY ASSESSMENT FOR REPTILES

Poor	Good	Exceptional
Limited vegetation structure, mainly short sward length <10cm, isolated or low connectivity, high levels of disturbance, low levels of sunlight at ground level, limited hibernacula or refugia present, unlikely to support significant number of prey. e.g. Amenity grassland, hardstanding, arable fields and bare ground.	Vegetation structure slightly varied, sward height >10cm, limited connectivity to other areas of suitable habitat, areas of open ground suitable for basking, limited refuge and hibernacula present, moderate disturbance, areas where the land has a south facing aspect, habitat suitable for invertebrates / prey, and water bodies present. e.g. Railway tracks, roadside verges, field margins, and parks.	Open habitat with varied vegetation structure, areas of long and short grassland, high levels of connectivity to suitable habitat, refuge and hibernation potential, areas with a south facing aspect, low disturbance, prey abundant throughout the area and water bodies present. Water bodies are particularly valuable to species such as grass snake. e.g. Brownfield sites, lowland heathlands, and hedgerows.

2.5 Population Estimation

2.5.1 The peak count of each species for each survey area was used to calculate reptile population estimations. The criteria used to assess the approximate population are taken from Natural England's Draft Reptile Mitigation Workshop (2010) (provided below in Table 2.2). The methodology uses a combination the peak count of adults obtained by a survey under 'good' survey conditions and the habitat suitability. If there is a discrepancy between the count-based method and habitat-suitability method, the highest population class will always be accepted. This precautionary approach has been developed because of the complex relationship between numbers of animals detected during surveys and the actual population size.

TABLE 2.2: POPULATION EVALUATION FOR SPECIES SURVEYED DURING ONE SITE VISIT (NATURAL ENGLAND 2010)

Species	Population Size Class		
	Small	Medium	Large
Slow-worm	<5, or presence + 'poor' habitat	5-20, or presence + 'good' habitat	>20, or presence + 'exceptional' habitat
Common lizard	<5, or presence + 'poor' habitat	5-10, or presence + 'good' habitat	>10, or presence + 'exceptional' habitat
Sand lizard	<5, or presence + 'poor' habitat	5-10, or presence + 'good' habitat	>10, or presence + 'exceptional' habitat
Grass snake	<5, or presence + 'poor' habitat	5-10, or presence + 'good' habitat	>10, or presence + 'exceptional' habitat
Adder	<5, or presence + 'poor' habitat	5-10, or presence + 'good' habitat	>10, or presence + 'exceptional' habitat
Smooth snake	<5, or presence + 'poor' habitat	5-10, or presence + 'good' habitat	>10, or presence + 'exceptional' habitat

2.6 Survey Limitations

2.6.1 The data for the 2008 surveys of the two receptor sites within the survey area (The Northern Triangle and Great Garlands Farm Elbow) are not unavailable, however, details of the receptor sites remaining capacities for each species are. It is considered that by using the maximum capacity of the sites to establish the various reptile's populations (i.e. how many of each species will be translocated) the lack of survey data for these two areas will not adversely affect the assessment. Similarly, this approach will satisfactorily account for any increases in populations due to the translocation purposes.

2.6.2 Reptile activity follows seasonal patterns and changes over the course of the year as well as from year to year (being partially dependant on recruitment from neighbouring sites). Reptile species, such as snakes are known to migrate between suitable habitat features especially between summer and winter. The surveys in May and June do therefore not necessarily provide a comprehensive indication of local reptile activity in the long term. However, due to the temporary nature of the works associated with the proposed development and the narrow working width (30m), this assessment is considered suitable.

2.6.3 Limited access restricted the number of surveys undertaken in Area1 to only three survey visits using only 10 refugia. However, due to the methodology employed within this report which combines habitat suitability and species presence, it is considered that accurate population estimations have been provided.

2.6.4 It is acknowledged that there may have been limited double counting of individual reptiles as they are mobile species and data was collected across two separate years and over a large area.

2.6.5 During the survey it was noted that within Area 4, four artificial refugia along the road were disturbed / vandalised by members of the public utilising the area. Within Area 5, approximately 14 refugia were lost due to destruction by farm machinery. These were not replaced as the suitability of habitat had deteriorated due to machine works. Within Area 6, two refugia were not surveyed on the first visit, one on the second and seven on the fifth visit, as the refugia had been over-turned. Any disturbed refugia

were returned to their original position in preparation for the next survey. It is considered that the level of disturbance encountered did not invalidate the survey results as only a small number of refugia were affected.

SECTION 3

RESULTS

3 RESULTS

3.1 Introduction

3.1.1 The 2010 survey area is divided into nine areas as represented within Figure 3. Areas 1-6, were surveyed in 2010 by experienced ecologists from PB, Areas 7 & 8 were surveyed in 2008 by Thomson Ecology.

3.2 Desk Study

3.2.1 Grass snakes, adders, slow worms and common lizards have all been recorded within the survey area during the previous surveys associated with the LG Development (Cambridge Ecology, and Thomson Ecology 2007 and 2008).

3.2.2 Overall, the desk study results imply that medium to large populations appear likely across the whole of the survey area for all four common reptile species.

3.3 Habitat Suitability

3.3.1 The survey area consists of habitats suitable to support common reptiles; these include areas of rough grassland, hedgerows, field boundaries, brown field, and woodland.

3.3.2 The habitats have been classified into 'poor,' 'good,' or 'exceptional' habitats and mapped (details of the habitats within the areas are provided in Table 3.1 and Figure 4).

3.3.3 The surrounding habitat is predominantly arable and grazed fields with a number of connected hedgerows running throughout. To the south of the Manorway (A1014) lies the LG Development (~282 ha), currently dominated by poor semi-improved grassland.

TABLE 3.1: DESCRIPTION OF THE SUITABLE REPTILE HABITAT WITHIN THE 2010 SURVEY AREAS

Area	Habitat Description	Habitat Assessment
1	The area comprises of a large area of ruderal unmanaged grassland forming an area the 'rough' of the adjacent golf course. This habitat contains six ponds. South of the grassland is a large pile of rubber tyres that would provide suitable refugia for reptiles.	Exceptional
2	The area is dominated by improved grassland used for cattle, however, the field lies adjacent to both the railway embankment and Stanford Warren Nature Reserve, It is likely that both the railway embankment and the nature reserve support reptiles that may use the field to forage in or its hedgerows as a commuting corridor. There have been many reptile sightings within the nature reserve PB (2010).	Good
3	A disused and abandoned fertiliser factory and associated infrastructure dominated by brownfield land. The building is derelict with areas of ruderal unmanaged grassland, intermittent and continuous scrub located sporadically around. There are plenty of semi-natural refugia suitable for reptiles located throughout the area.	Good
4	Unmanaged, defunct, and continuous hedgerows dominated by hawthorn, bramble, elder (*Sambucus nigra*) and areas of grass run along both sides of rainbow lane, providing a connective corridor.	Good
5	Hedgerows with associated ditches (dry and wet) surrounding arable fields considered suitable to support common reptiles.	Good
6	Continuous areas of scrub, semi-improved grassland, and marginal scrub run along the northern side of the A1014 (The Manorway). Hedgerows with associated ditches (dry and wet) and semi-improved grassland surround the fields north of the A1014 (The Manorway).	Good / Exceptional
7	Brownfield area comprising of areas of hardstanding, spoil heaps, scattered scrub, and bare earth. These provide suitable foraging, shelter, basking, and hibernating habitat.	Exceptional
8	The area is dominated by the railway embankment; this consists of a bank of gravel surrounded by areas of connected scrub, dominated by hawthorn (*Crataegus monogyna*) and bramble (*Rubus fruticosus*). This is due to the minimal nature of habitat management, lack of grazing and the general lack of disturbance within the areas.	Good
9	The northern triangle has been allocated as a GCN and reptile translocation site for the LG Development. It is comprised mainly of rough grassland and wet ditches. The area has been managed and enhanced for both reptiles and GCN with the creation of hibernacula and 24 water bodies throughout the site.	Exceptional

3.4 Field Surveys

3.4.1 Table 3.2 summarises the weather conditions on each survey.

TABLE 3.2: SUMMARY OF THE WEATHER CONDITIONS FOR EACH OF THE SURVEY VISITS (2010)

Visit	Date (2008)	Weather
1	3rd June	Clear no clouds, gentle breeze, 20°C
2	4th June	Cloud cover – 4 / 8, light breeze, 17°C
3	8th June	Cloud cover 6 / 8, gentle breeze, 20°C, heavy rain during the night
4	11th June	Overcast, Cloud cover 8 / 8, light breeze, 16°C, light drizzle earlier in the day.
5	14th June	Clear no clouds, light breeze, 19°C
6	16th June	Cloud cover – 7 / 8, moderate wind, 16°C
7	18th June	Cloud cover 6 / 8, light breeze, 16°C
8	22nd June	Cloud cover 7 / 8, light air, 20°C
9	30th June	Cloud cover 2 / 8, gentle breeze, 20°C
10	2nd July	Cloud cover 1 / 8, light air-gentle breeze, 20°C
Area 1	17th may	Clear no clouds, gentle breeze, 17°C
Area 1	26th May	Clear no clouds, gentle breeze, 17°C
Area 1	3rd June	Clear no clouds, gentle breeze, 18°C
Area 3	20th July	Cloud cover 1 / 8, gentle breeze, 20°C

3.4.2 The surveys confirmed the presence of all four common reptile species within the survey area. It is considered that all populations present within the area are breeding populations as sub-adults and juveniles were recorded for each species. The following describes in detail the results for the different areas.

Area 1

3.4.3 The peak count of one common lizard, five adders, and two grass snakes were recorded within Area 1 during one visit (Table 3.4). All snakes recorded were located adjacent to a water bodies. Alone these counts indicate the area supports a 'low' population of common lizards and grass snakes, and a 'medium' population of adders (Table 2.2). However, in combination with the exceptional suitability of the habitat recorded on site, the population estimation for all three species is large (Table 3.6).

3.4.4 Although slow worms were not found during the survey, it is considered likely they occur within the survey area as the desk study confirms their presence in the wider area and Area 1 itself is well connected to other suitable habitat such as unmanaged grassland, hedgerows, and continuous scrub.

3.4.5 During the surveys Area 1 was only surveyed on three separate locations, potentially limiting the numbers of reptiles recorded.

Area 2

3.4.6 The peak count of six common lizards, one grass snake, and six slow worms were recorded within Area 2 during one visit (Table 3.4). The majority of reptiles recorded within Area 2 were observed using the area of wet inundation located immediately adjacent to the fields' eastern boundary, adjoining the local nature reserve, and close to a railway embankment (Area 8).

3.4.7 These numbers indicate low population estimations for all of the present species (Table 2.2). However, in combination with Area 2 supporting habitat classified as

'good' for reptiles (Table 3.1), the peak counts reveal that 'medium' populations are estimated for all three species present (Table 3.6, Figure 5).

Area 3

3.4.8 The peak count of one common lizard, and three slow worms were recorded within Area 3 during one visit (Table 3.4). The slow worms and common lizards were mainly observed to be utilising the large area of spoil surrounding the derelict fertiliser factory.

3.4.9 The peak counts numbers indicate low population estimations for all species present (Table 2.2). However, in combination with Area 3 supporting habitat classified as 'good' for reptiles (Table 3.1), the peak counts reveal that 'medium' populations are estimated for both species present (Table 3.6, Figure 5).

Area 4

3.4.10 The peak count of five common lizards, and 27 slow worms were recorded within Area 4 during one visit (Table 3.4). Higher numbers of slow worms and common lizards were observed at the southern end of Rainbow Lane where the continuous scrub and areas of grassland are larger. Furthermore, the southern section of area 4 is highly connected with suitable habitat such as the railway embankment located directly south.

3.4.11 The peak counts indicate a 'medium' population of common lizards and a 'large' population of slow worms (Table 2.2). However, in combination with Area 4 supporting habitat classified as 'good' for reptiles (Table 3.1), the peak counts reveal that 'medium' populations are estimated for both species present (Table 3.6, Figure 5).

Area 5

3.4.12 The peak count of one common lizard, two adders and 5 slow worms were recorded within Area 5 during one visit. The majority of reptiles were located close to several farm buildings (Great Garlands Farm) and an embankment of an arable field immediate south of the farm. No reptiles were recorded along the embankments of the track leading south away form the farm.

3.4.13 The peak counts indicate a 'medium' population of slow worms, and a 'small' population of adders and common lizard (Table 3.2.3). However, in combination with Area 5 supporting habitat classified as 'good' for reptiles (Table 3.1), the peak counts reveal that 'medium' population estimations for slow worm, adder, and common lizard (Table 3.6, Figure 5).

Area 6

3.4.14 The peak count of six common lizards, and five adders, three grass snakes and 57 slow worms (Thomson Ecology 2008) were recorded within Area 6 during one visit. Although reptiles were recorded throughout this area, a particularly large number of slow worms were recorded along the northern embankment of the A1014 (The Manorway).

3.4.15 The peak counts indicate a 'small' population of grass snake and common lizard, 'medium' populations of adder, and a 'large' population of slow worm (Table 3.4 Figure 5). However, in combination with Area 6 supporting habitat classified as 'good-excellent' for reptiles (Table 3.1), the peak counts reveal population estimations for all four species is 'large' (Table 3.6, Figure 5).

Area 7

3.4.16 The peak count of one common lizard, and one slow worm were recorded within Area 7 during one visit (Table 3.5).

3.4.17 The peak counts indicate a 'small' population common lizard and slow worm (Table 2.3.2). However, in combination with Area 7 supporting habitat classified as 'exceptional' for reptiles (Table 3.1), the peak counts reveal population estimations for all four species is 'large' (Table 3.6, Figure 5).

Area 8

3.4.18 Peak counts of one common lizard, five grass snakes, and four slow worms were recorded within Area 8 during one visit (Table 3.5).

3.4.19 The peak counts indicate a 'small' population common lizard and slow worm and a 'medium' population of grass snake (Table 2.3.2). However, in combination with Area 8 supporting habitat classified as 'good for reptiles (Table 3.1), the peak counts reveal population estimations for all three species is 'medium' (Table 3.6, Figure 5).

Area 9

3.4.20 As of the 31st March 2010, 99 adders, 13 grass snakes, 1,211 common lizards and 2,291 slow worms had been released into the Northern Triangle, a total of 3,614 reptiles (Table 3.3). However, the carrying capacity for each species had not yet been reached and approximately 1,400 more reptiles were due to be moved into this area in 2010 and 2011.

3.4.21 In combination with Area 9 supporting habitat classified as 'exceptional' for reptiles (Table 3.1), the maximum capacity counts reveal population estimations for all four species is 'large' (Table 3.6, Figure 5).

TABLE 3.3: PREDICTED CARRYING CAPACITY OF NORTHERN TRIANGLE EAST RECEPTOR SITE (THOMSON ECOLOGY, 2010)

Species	Number per hectare	Estimated carrying capacity of adults	Total released	Estimated remaining carrying capacity
Adder	8*	152	99	53
Grass Snake	4**	76	13	63
Common Lizard	80**	1,520	1,211	309
Slow Worm	195*	3,705	2,291	1,414

**- highest density recorded from trapping at London Gateway donor sites*
*** - lower figure of high population density recorded in HGBI guidelines*

TABLE 3.4 PEAK REPTILE COUNT FOR 2010 SURVEY AREAS

Area	Common Lizard	Adder	Grass Snake	Slow Worm
1	1	5	2	0
2	6	0	1	6
3	1	0	0	3
4	5	0	0	27
5	1	2	0	5
6	6	5	3	57

TABLE 3.5 PEAK REPTILE COUNT FOR 2008 SURVEY AREAS

Area	Common Lizard	Adder	Grass Snake	Slow Worm
7	1	0	0	1
8	1	0	5	4
9	N / A	N / A	N / A	N / A

TABLE 3.6 POPULATION SIZE CLASS ASSESSMENT OF THE AREAS

Area	Common Lizard	Adder	Grass Snake	Slow Worm
1	Large	Large	Large	Not Recorded
2	Medium	Not Recorded	Medium	Medium
3	Medium	Not Recorded	Not Recorded	Medium
4	Large	Not Recorded	Not Recorded	Large
5	Medium	Medium	Not Recorded	Medium
6	Large	Large	Large	Large
7	Medium	Not Recorded	Not Recorded	Medium
8	Large	Not Recorded	Large	Large
9	Large	Large	Large	Large

3.4.22 Adders were not identified within areas 2-4, and 7 & 8 (Table 3.3 and 3.4, Figure 5). Adders are however generally understood to live at lower densities than slow worms and lizards, and records of adders have been found outside the survey area within the immediate surrounds (Thomson 2008). On a precautionary basis it can therefore be assumed that adders occur throughout the survey area within suitable habitat at low frequencies.

3.4.23 Grass snakes were not recorded within areas 3, 4, 5, & 7 (Table 3.3 and 3.4), however, this does not prove that they are absent. Like adders, grass snakes also tend to be found at much lower densities than slow worms or lizards, and as a result are less likely to be recorded during a survey. Furthermore, grass snakes tend to travel long distances in search of prey, it is therefore reasonable to assume presence throughout the wider survey area.

Receptor Sites

3.4.24 Great Garlands Farm Elbow Receptor Site currently supports optimal habitat for reptiles, the area has been designed and managed as a great crested newt (*Triturus cristatus*) and reptile receptor site for the adjacent LG Development. Currently there are no records of how many reptiles have been released into the receptor site (Table 3.7), however, it is planned that reptile translocation will commence in the summer of 2010 and continue into 2011 (Thomson Ecology 2008). Medium populations of common lizard, adder, and slow worm are present within Great garlands Farm, Area 5 (Table 3.5). However, the population is likely to increase to a 'large' population size following the translocation. Grass snakes are not planned to be released into the receptor site as they are considered to be a potential predator of great crested newts (Thomson Ecology 2010).

TABLE 3.7: PREDICTED CARRYING CAPACITY OF GREAT GARLAND FARM RECEPTOR SITE (THOMSON ECOLOGY, 2010)

Species	No. ha	Estimated carrying capacity of adults	Total released	Estimated remaining carrying capacity
Adder	8*	11	0	11
Grass Snake	4**	5	0	5
Common Lizard	80**	108	0	108
Slow Worm	195*	263	0	263

**- highest density recorded from trapping at London Gateway donor sites*
*** - lower figure of high population density recorded in HGBI guidelines*
****- as the receptor site is currently enclosed by temporary amphibian fencing and grass snakes are a potential predator of Great Crested Newts (Triturus cristatus) it is not proposed to release grass snakes in the area*

SECTION 4

DISCUSSION AND RECOMMENDATIONS

4 DISCUSSION AND RECOMMENDATIONS

4.1 Discussion

4.1.1 Reptile surveys were undertaken throughout the survey area to inform the proposed development of any potential constraints associated with this species group. All four common reptile species were recorded; common lizards, slow worms, grass snakes and adders.

4.1.2 Of the nine separate sub-areas surveyed, all four species were found to be present in 'large populations' in at least three of them. All four species were recorded in large populations in areas 6 and 9, north of the A1014 (The Manorway). Common lizards were the only species to be recorded within all 9 survey areas. There were no other key similarities or differences between the presence / absence or population size of the reptiles throughout the survey area.

4.1.3 Terrestrial habitats considered suitable for reptiles, such as coarse grassland, dense and scattered scrub and brownfield land are abundant throughout the survey area. This patchwork of suitable habitat provides connectivity for reptiles to move freely around and throughout the survey area. Given the connectivity of optimum habitats, the presence of large and medium sized populations of all four species and understanding reptiles are mobile species, it is possible to assume, on a precautionary basis, that there is a large meta-population of each reptile species present within the survey area. This implies that each reptile species could be present throughout survey area, even where they have not been recorded. Furthermore, it is possible that any medium populations recorded in 2010 could increase to high populations before the commencement of the proposed works. The recommendations presented below have therefore been made based on the assumption that 'large' populations of each reptile species are present throughout.

4.1.4 The construction of the pipeline is due to commence in Area 1 and will bisect Areas 2, 4, 5, 6, 7 and Area 9, the Northern Triangle. These works would result in the direct temporary loss and disturbance of suitable habitat along the majority of the route. The HDD technology would also result in temporary habitat loss at the access and egress points and along any access routes in Areas 2, 6, 7 and 9. Unmitigated, these works are likely result in the mortality or injury of reptiles and therefore a breach of the Wildlife & Countryside Act 1981 (as amended).

4.1.5 It is acknowledged that the risk of killing or injuring reptiles is likely to vary depending on the location of the works and which habitat type may be affected. For example, where the pipeline or the HDD access / egress points are located within sub-optimum habitat such as the start of the pipeline (Area 1, arable fields) the risks are likely to be reduced. Conversely, any works undertaken within Area 9, the Northern Triangle receptor site, an area dominated by optimum habitat and known to support large populations of all four common reptile species, the risks would be significantly higher.

4.1.6 The development of the substations within the survey area will result in permanent habitat loss. The preferred substation options 1, 5a, and 10, (Figure 1) are all likely to be situated within arable fields which provide little or no value to reptiles. This should be confirmed following the adoption of the final design as the risk of killing reptiles will increase if field headlands or boundaries are to be directly affected.

4.1.7 Option 5b is located in an area of land adjacent to an industrial estate dominated by brownfield land and is considered to be of 'exceptional' value for reptiles. Although only medium numbers of common lizards and slow worms were recorded during the three surveys completed in the adjacent area 3 (due to restricted access), the site is bounded to the south by Site A which is known to have supported all four common species of reptile. To date 1963 reptiles have been translocated from Site A into the Northern Triangle receptor site. The numbers were made up of 538 common lizards,

1361 slow worms, 57 adders, and seven grass snakes, as such, it is likely the wider area, including the site of Option 5b still supports significant populations of all four reptile species.

4.1.8 It should be acknowledged that separate detailed ecological impact assessments are currently being undertaken specifically for the substation and their associated infrastructures.

4.1.9 The indicative route currently runs directly through the survey area 9, the Northern Triangle Receptor Site. The receptor site has undergone extensive habitat creation and enhancement, primarily for great crested newts. However, the creation of connecting habitat, basking areas, and suitable shelter and hibernation habitat is also significantly beneficial for reptiles. To date 3,614 reptiles have been released into the area from Site A and the main LG Development of which 99 were adders, 13 grass snakes, 1,211 common lizards, and 2.291 slow worms. The site is therefore considered to contain 'large' populations of all four species of reptile.

4.1.10 It is likely that the population of reptiles within the Northern Triangle, as well as the Great Garlands Farm Elbow and Boundary receptor sites will continue to increase until 2011, due to the continued translocation of reptiles from the LG Development site (Thomson 2008). However, it is not considered that any past or present translocations will significantly affect the accuracy of assessment as the locations of the receptor sites and the numbers of reptiles moved or likely to be moved are known. Any recent or future changes can therefore be predicated with reasonable accuracy. Furthermore, the recommendations provided are based on precautionary large population for each species.

4.1.11 In summary, it is considered that the survey area and surrounding habitat support a large meta-population of all four species of reptiles. The construction of the pipeline and associated infrastructure are envisaged to result in direct temporary impacts on the local populations of reptile. However, due to the nature and small footprint, the proposed scheme is unlikely to result in long-term negative impacts on local populations of reptiles. To ensure legal compliance it would be essential for mitigation measures to be implemented to reduce the impacts on reptiles associated with the proposed development.

4.2 Recommendations

General

4.2.1 At the time of writing the exact alignment of the route had not been finalised. As such, it is recommended that the pipeline route is designed to avoid the most suitable reptile habitats (Figure 4). Where bisection of suitable habitat is unavoidable, measures should be taken to reduce any possible direct impacts. This may include bisecting sections of suitable habitat at their thinnest point or where the suitability is at its lowest point, for example taking advantage of existing gaps in hedgerows.

Habitat Manipulation

4.2.2 As the envisaged impacts on reptiles are likely to be restricted to within the 30 m wide working width, a comparatively narrow area, habitat manipulation is considered suitable to avoid the direct mortality or injury of reptiles. This mitigation technique is based on the displacement of reptiles from the habitat considered suitable to support them. Habitat manipulation aims to make any optimum or sub-optimum habitats as unsuitable for reptiles as possible, this would include coarse grassland, brown field land, hedgerows and so on (Figure 4). Once the habitats have been degraded, it is likely that most reptiles will naturally move out of the 30 m wide working width to more suitable habitats.

4.2.3 The displacement of reptiles using habitat manipulation would consist of a gradual removal of suitable habitat prior to the site works, whereby areas of grassland or similar within the footprint of the works is cut using hand held tools, generally a strimmer to approximately 15cm and left for several days to allow reptiles present within the underlying vegetation to disperse naturally to adjacent more suitable habitat. After this dispersal period the area should be inspected by an ecologist and followed by a second vegetation cut, reducing the vegetation to ground height. The vegetation should undergo regular strimming prior to and during the construction works to ensure that no reptiles re-colonise the area.

4.2.4 Any hibernacula (piles of wood, stones or dead vegetation) should be taken apart by hand by an experienced ecologist and any reptiles found moved to a safe location off site. Habitat manipulation should be undertaken when reptiles are most active, generally agreed to be between April and June and during September.

4.2.5 On completion of the habitat manipulation it may be necessary to erect reptile proof fencing around sections of the works where it can not be confirmed that reptiles will not try and access or relocate. This will be particularly important where the working width crosses any known or possible commuting corridors, such as the vegetation either side of Rainbow Lane (Area 4).

Recommendations for the Substations

4.2.6 Substation Options 1, 5a, and 10 are located within large arable fields and are not considered optimum or reptiles (Figures 1 & 4). Assuming that all site works would occur within the field itself, habitat manipulation, as described above, is likely to be sufficient to ensure legal compliance. Exclusion fencing may be required along the any site boundaries located in close proximity to optimal habitats, such as hedgerows. This fencing will prevent reptiles being attracted onto site by any artificial refugia (stored materials) or from naturally commuting through the site.

4.2.7 Substation Option 5b is considered to be of exceptional habitat for reptiles and following only three site survey visits was found to support medium populations of slow worms and common lizards. As described above (paragraph 4.1.7) the area is likely to support an even larger population of reptiles. Given this knowledge and understanding the construction of the substation would result in the permanent loss of approximately 1 hectare of land, it is unlikely that habitat manipulation would sufficient ensure the site was devoid of reptiles. It is therefore likely that the reptile population here would need to be translocated.

4.2.8 The translocation works would first require habitat manipulation of the area to naturally exclude as many reptiles as possible. Following this, a combination of exclusion fencing and artificial refugia would be strategically placed on site. The artificial refugia would be checked regularly following standard methodologies and any reptiles found would be caught and moved out of the 'site boundary'. These translocation operations are dependant upon the predicated reptile population on site. Given the size of the site, it is likely that any translocation measures here would be undertaken for a minimum of 30 days during suitable weather conditions, plus an additional five consecutive reptile free days, also during suitable weather conditions.

4.2.9 It maybe necessary to provide a suitable receptor site for any translocated reptiles. This site should be local and known to have capacity to support additional reptiles, for example, a site known to currently support good or exceptional quality habitat and no or low populations of reptiles. It is proposed that the existing LG Developments receptor sites are used, if not at capacity. Alternatively, a new receptor site should be identified. Depending on the site, further surveys may be required to confirm the existing populations are low and habitat enhancement undertaken to ensure the site is of maximum suitability for reptiles.

4.2.10 Depending on the quality of the habitat lost during the construction of the substations, certain mitigation measures should be considered to help offset the impacts. This may include enhancement by planting or management of the surrounding habitat or the provision of artificial hibernacula within the retained habitat.

4.2.11 The applicability of each mitigation technique, particularly the potential reptile translocation of substation 5b will require detailed consideration and consultation / approval with Natural England. It is recommended that such consultation commences once a preferred route and substation locations have been agreed.

4.2.12 It should be acknowledged that separate detailed ecological impact assessments are currently being undertaken specifically for the substation and their associated infrastructures.

Management and Monitoring

4.2.13 Post construction all disturbed habitat should be replaced like for like. As such the landscape would be returned to how it was pre-development with fragmented hedgerow replanted, grasslands re-seeded and natural refugia reinstated.

4.2.14 To ensure continued compliance throughout the construction works, these mitigation requirements should be incorporated into a Construction Environmental Management Plan (CEMP), which would detail the best practice measures for the protection and long-term gain for wildlife on site. The plan will identify the roles and responsibilities of all stakeholders during the construction phase, determine the location of environmentally sensitive areas and set out the requirements for environmental monitoring and reporting. Furthermore it should specify that all construction staff should be briefed on reptile identification, recording protocol, and emergency handling by a PB Ecologist prior to commencement of any work at the site

4.2.15 It is recommended that no construction works, including the HDD access / egress areas, occur inside the Northern Triangle receptor site, which is currently managed under the strict legal requirements of a Natural England great crested newt development licence. Such avoidance would also avoid directly impacting an area optimal reptile habitat which is known to support large populations of all four common species. Any works inside the Northern Triangle would require extensive and detailed consultation with Natural England who are likely to request further extensive surveys, fencing and translocation at the very least before works could commence, if at all. Works situated outside of the Northern Triangle would still require habitat management and potentially fencing to exclude reptiles, as the surrounding area is also known to support large populations of all four common reptile species.

4.2.16 The survey area has been designed around an indicative route based on the alignment of the existing gas pipeline. This is because the final linear route alignment has yet to be agreed at the time of writing. The recommendations made within this Phase II report are therefore intrinsically linked to the indicative route. Should the final route differ significantly from the indicative alignment it could affect suitable reptile habitat outside of the survey area that has not been considered within this report, and further detailed surveys might be required.

SECTION 5

CONCLUSIONS

5 CONCLUSIONS

5.1.1 Reptile surveys were undertaken in 2008 / 2009 by Thomson Ecology and by PB in 2010. The surveys confirmed the presence large populations of common lizard, slow worm, adder, and grass snake throughout the survey area. Given the abundance of optimum habitat and suitable connectivity throughout the site, it is assumed that there are large meta-populations of all four common reptile species throughout the survey area.

5.1.2 Due to the temporary nature of the proposed development and the comparative narrow footprint of the working width, it is considered that the long-term ability of this area to support reptiles will not be affected. Measures have been recommended to avoid and mitigate the direct loss of reptiles due to the proposed works and thus to ensure legal compliance with the Wildlife & Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010.

5.1.3 Mitigation measures set out within this report have been broadly designed to offset temporary disturbances and where applicable habitat loss and fragmentation. These include designing the proposed development to avoid impacting habitats considered suitable to support reptiles or where reptiles have been recorded. The manipulation of suitable habitat to naturally exclude reptiles form the working width will also be required. Exclusion fencing and potential habitat enhancement maybe required depending on the final route alignment and which substation Option is chosen. The mitigation measures should be subject to revision once detailed designs have been completed and incorporated into a CEMP. The latest guidelines should be continuously adopted and advice from Natural England sort.

SECTION 6

REFERENCES

6 REFERENCES

Froglife (1999) Advice Sheet 10: Reptile Survey – An introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Peterborough, Froglife

Natural England (2010) Herpetofauna Worker's Meeting 2010 Workshop: Reptile Mitigation Guidance.

Joint Nature Conservation Committee (1998) 'Herpetofauna Workers Manual' Gent, A. & Gibson, S. (eds). JNCC, Peterborough.

Parsons Brinckerhoff (2010), Gateway Energy Centre Ecology Scoping Report

Parsons Brinckerhoff (2010), Phase II Great Crested Newt Report for the Gateway Energy Centre

Thomson Ecology (2008) London Gateway – Site A Reptile Mitigation Method Statement for DP World

Thomson Ecology (2008) Reptile Ecological Action Plan for DP World

FIGURES

FIGURE 1: LOCATION OF THE SURVEY AREA AND THE CCGT SITE LOCATION, GAS INLET LOCATIONS, THREE POSSIBLE SUBSTATIONS AND HOW THE SURVEY AREA HAS BEEN DIVIDED INTO SEPARATE SMALLER AREAS

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Notes

- Total Survey Area
- Surveyed by Thomson Ecology in 2008
- Surveyed by Parsons Brinckerhoff in 2010
- CCGT Power Station
- Start of Gas Pipeline
- Potential Sub Station Location

* Survey effort was designed to focus on habitats intermittently along the indicative route and not the whole survey area. This is justified by the relatively small scale and temporary nature of predicted impacts

0 100 200 300 400 500
Metres

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Gateway Energy Centre

Drawing Title: Reptile Survey Areas

Scale at A3: 1:20,000

Drawn	Approved
JL	TM

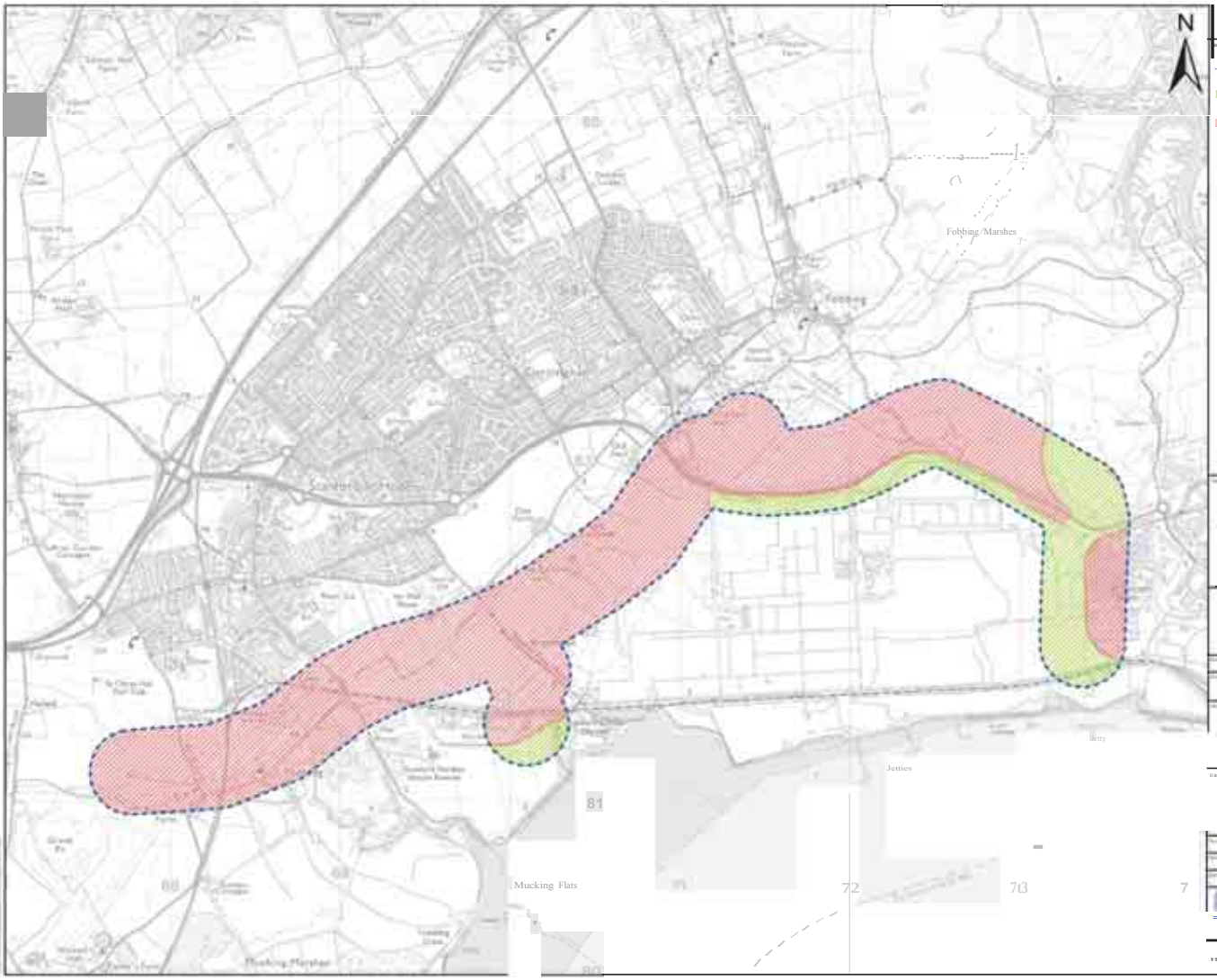
Stage 1 check	Stage 2 check	Originated	Date
			08/09/2010

PARSONS BRINCKERHOFF
6 Devonshire Square,
London, EC2M 4YE
Tel: 020 7337 1700 Fax: 020 7337 1701

Drawing Number: 63958A_RPTL_SA

Rev

FIGURE 2: INDICATION OF THE LAND WITHIN THE SURVEY AREA PREVISOULY SURVEYED FOR GREAT CRESTED NEWTS BY THOMSON ECOLOGY IN 2008/9



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Total Survey Area

Area Surveyed in 2008 as Part of the Park Development

Area Not Previously Surveyed

100 200 300 400 500
Meters

FINAL

Gateaway Enregy Centre

Indication of Land Already Surveyed for Reptiles in 2008 by Thomson Ecology

PARSONS BRINCKERHOFF

,,,gNSbJ628A_EXS_RPTL

FIGURE 3: LOCATION OF THE REPTILE RECEPTOR SITES LOCATED WITHIN THE SURVEY AREA, DESIGNED AND IMPLEMENTED AS PART OF THE LARGER DP WORLD LG DEVELOPMENT.

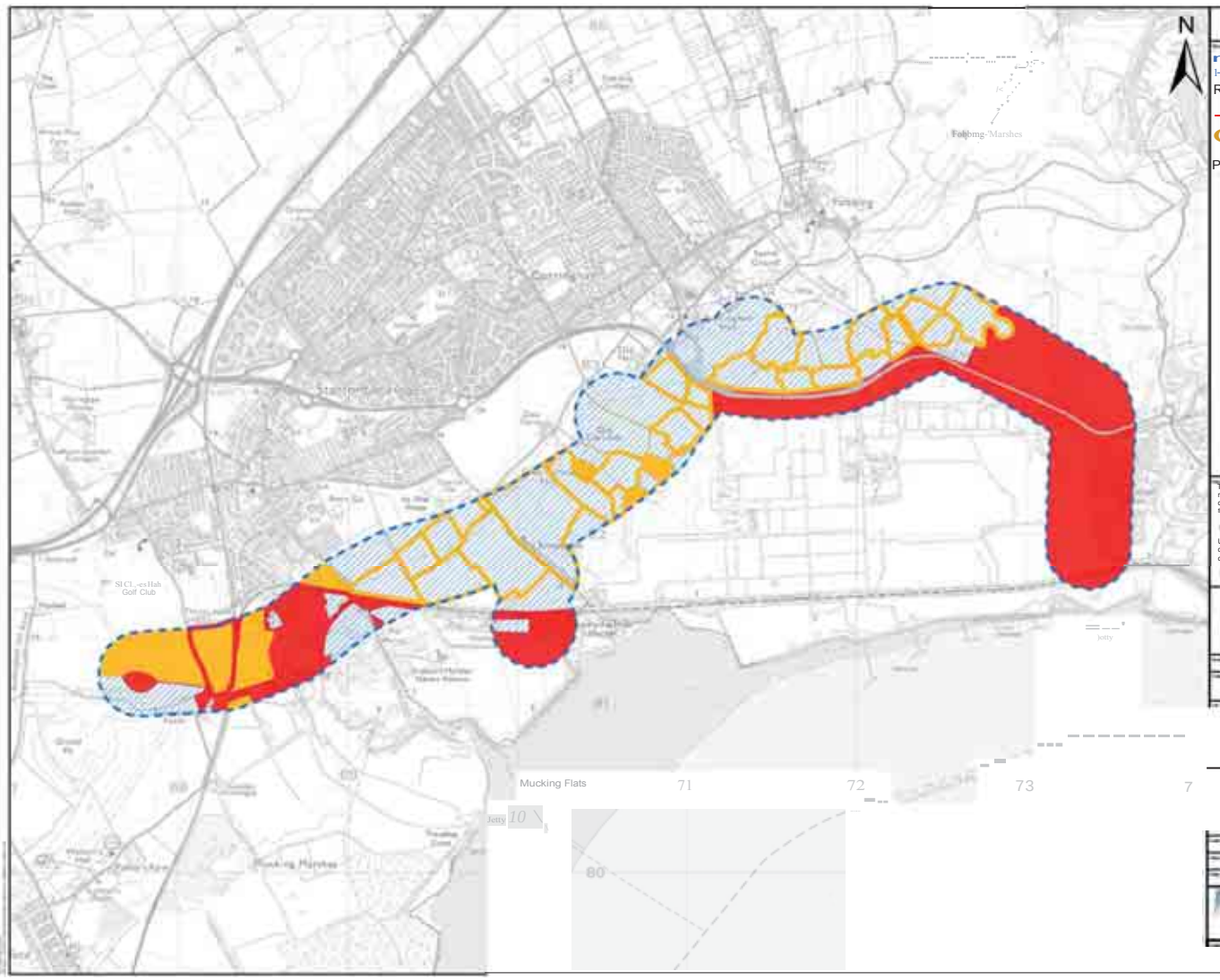

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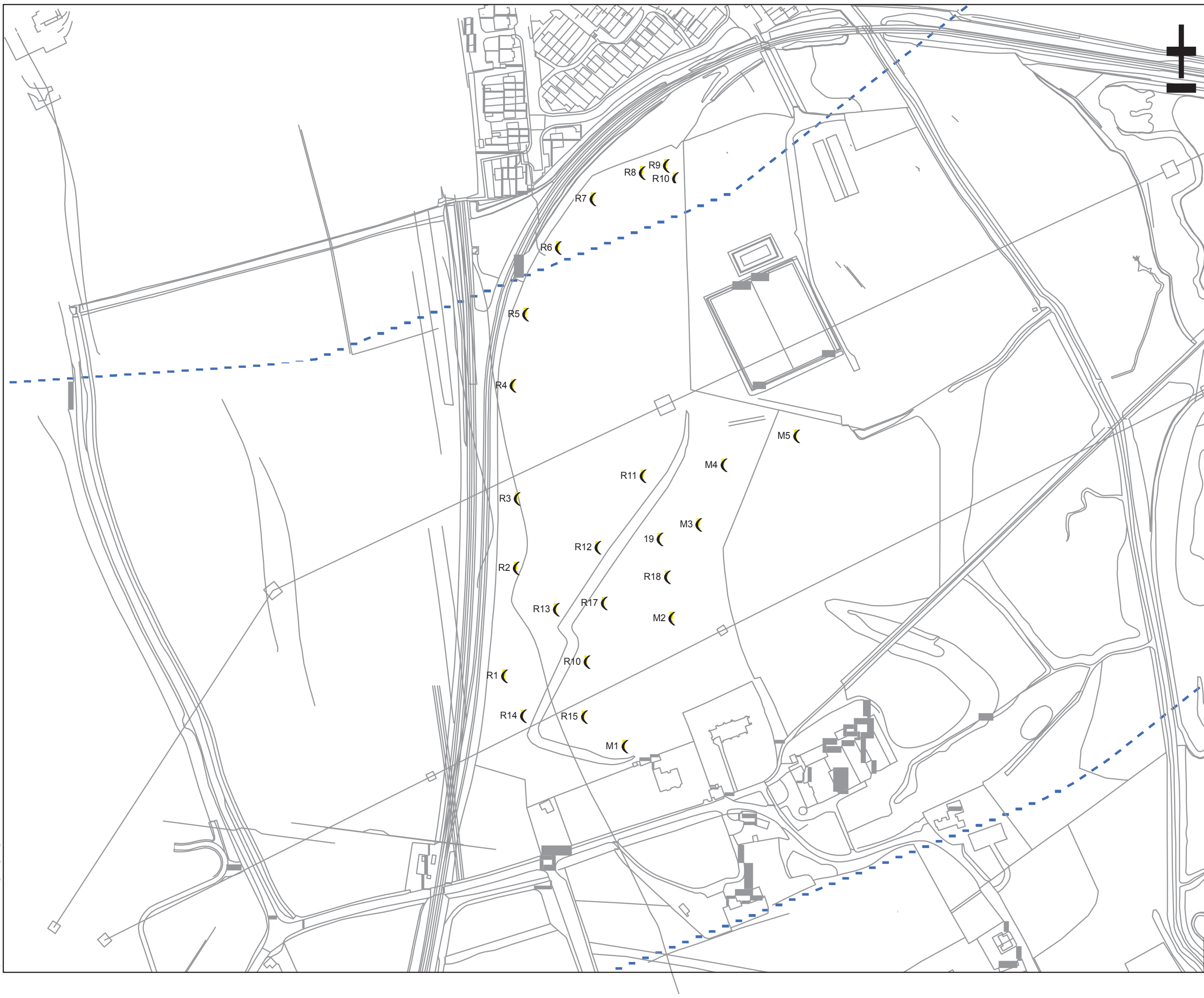
FIGURE 4: LOCATION OF SUITABLE REPTILE HABITAT WITHIN THE SURVEY AREA



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Notes

Total Survey Area

Reptile Traps

0 20 40 60 80 100
Metres

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Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Gateway Energy Centre

Drawing Title: Location of Reptile Traps

Scale at A3: 1:2,500

Drawn	JL	Approved	TM
Stage 1 check	Stage 2 check	Originated	Date 01/06/2010

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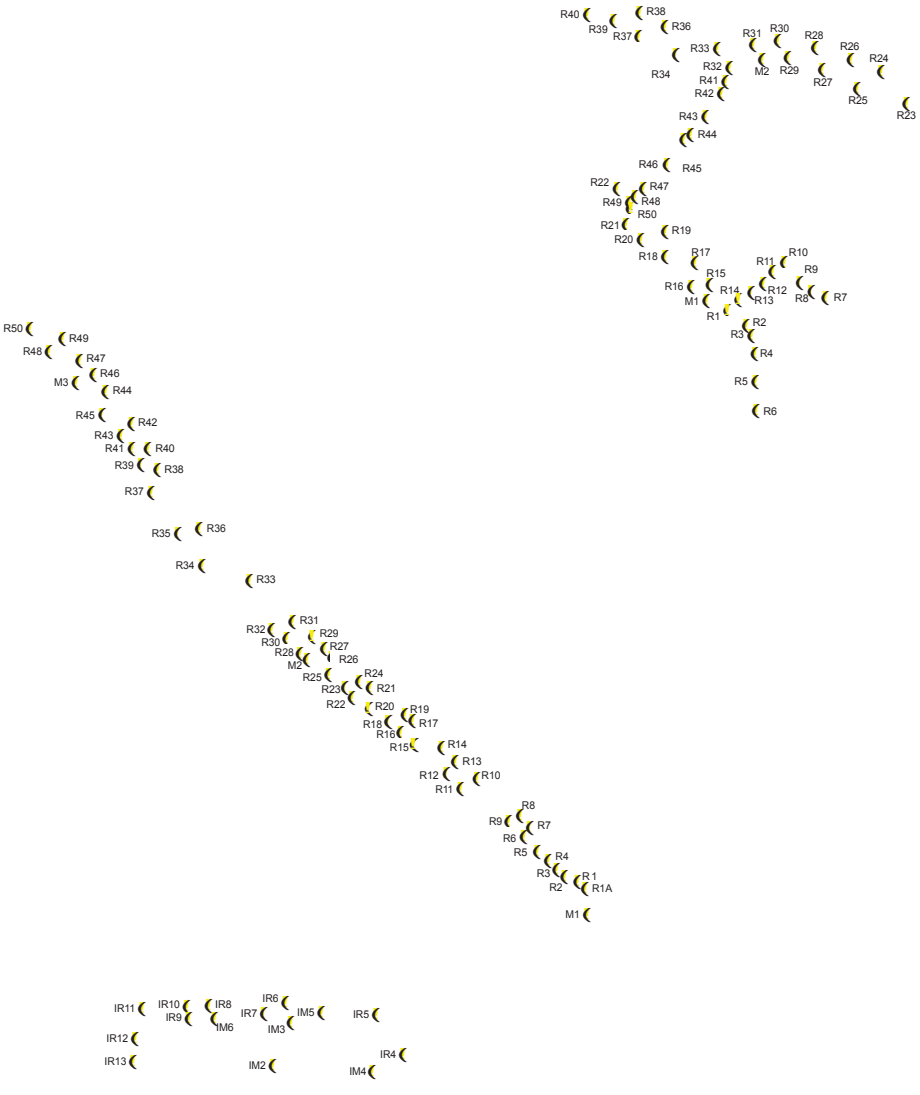

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Notes

Total Survey Area

Reptile Traps

0 20 40 60 80 100

Metres

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0100031673 2010

Revision Details	By	Date	Suffix
	Check		

Drawing Status

FINAL

Job Title

Gateway Energy Centre, Thamesmead

Drawing Title

Location of Reptile Traps

Scale at A3

1:4,000

Drawn	Approved
JL	TM

Stage 1 check	Stage 2 check	Originated	Date
			01/04/2010

6 Devonshire Square,
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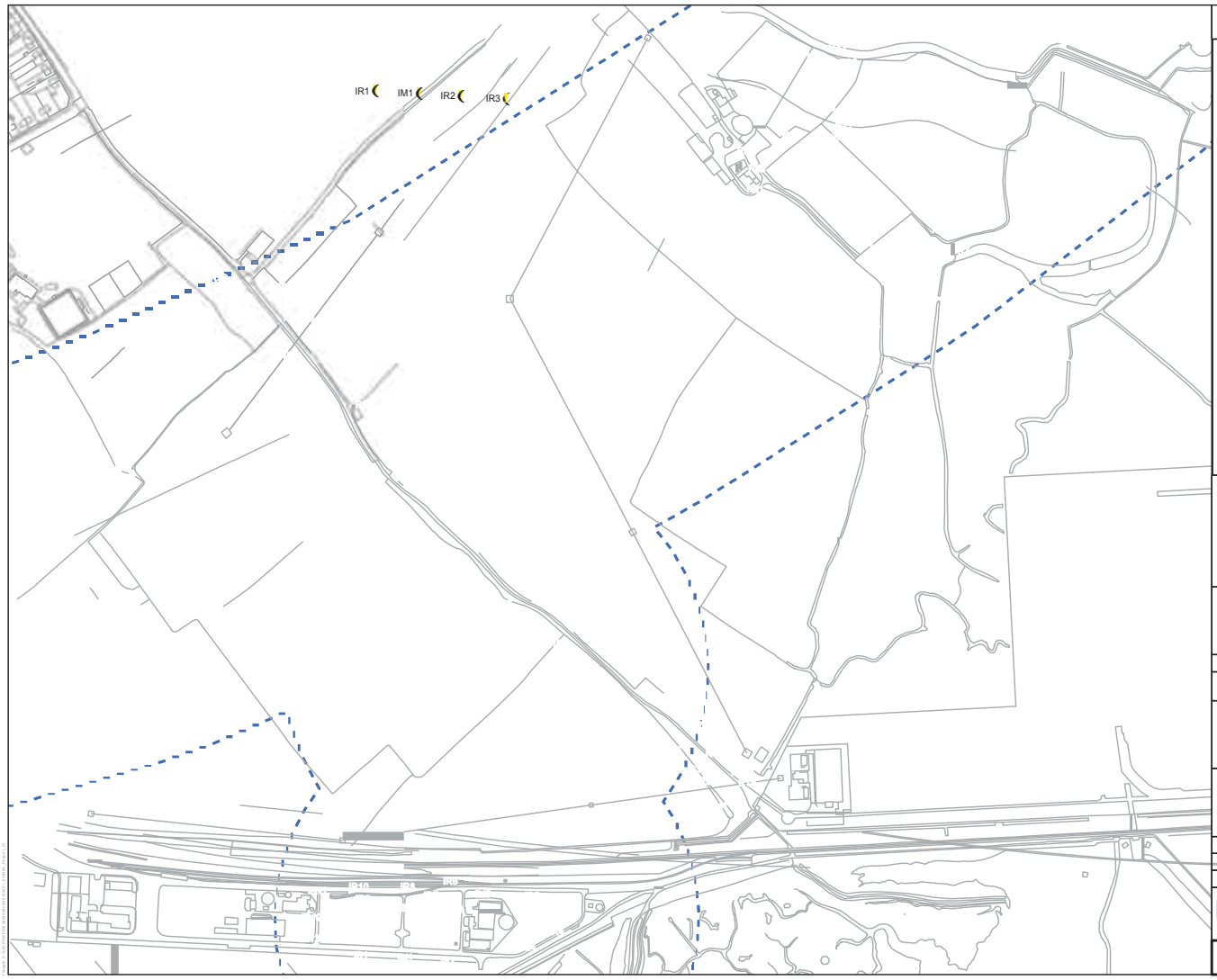
Drawing Number

Rev.



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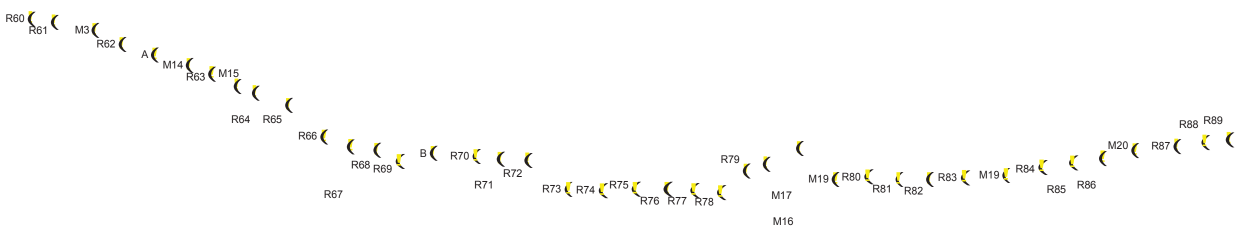

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Notes

Total Survey Area

Reptile Traps

0 20 40 60 80 100

Metres

Revision Details | By | Date | Suffix

Check

Drawing Status

FINAL

Job Title

Gateway Energy Centre

Thames Haven

Drawing Title

Location of Reptile Traps

Scale at A3 1:2,500

Drawn JL Approved TM

Stage 1 check Stage 2 check Originated Date 01/06/2010

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London, EC2M 4YE

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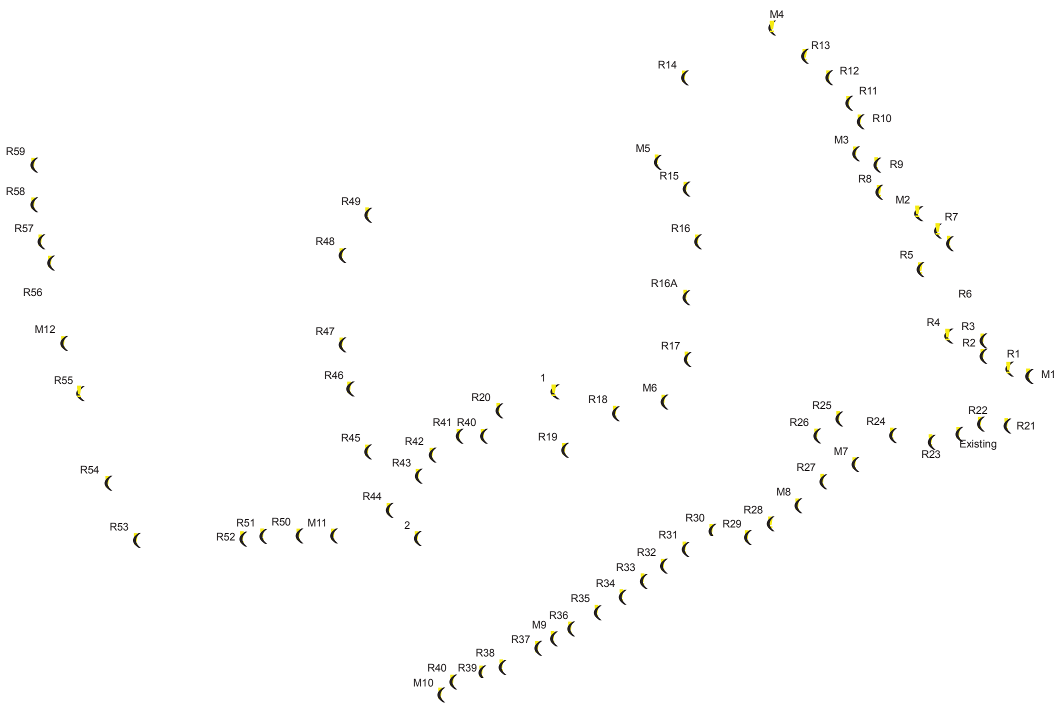

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Notes

Total Survey Area

Reptile Traps

0 20 40 60 80 100

Metres

Revision Details | By | Date | Suffix

Check

Drawing Status

FINAL

Job Title

Gateway Energy Centre

Thames Haven

Drawing Title

Location of Reptile Traps

Scale at A3: 1:2,500

Drawn: JL | Approved: TM

Stage 1 check | Stage 2 check | Originated | Date 25/05/2010

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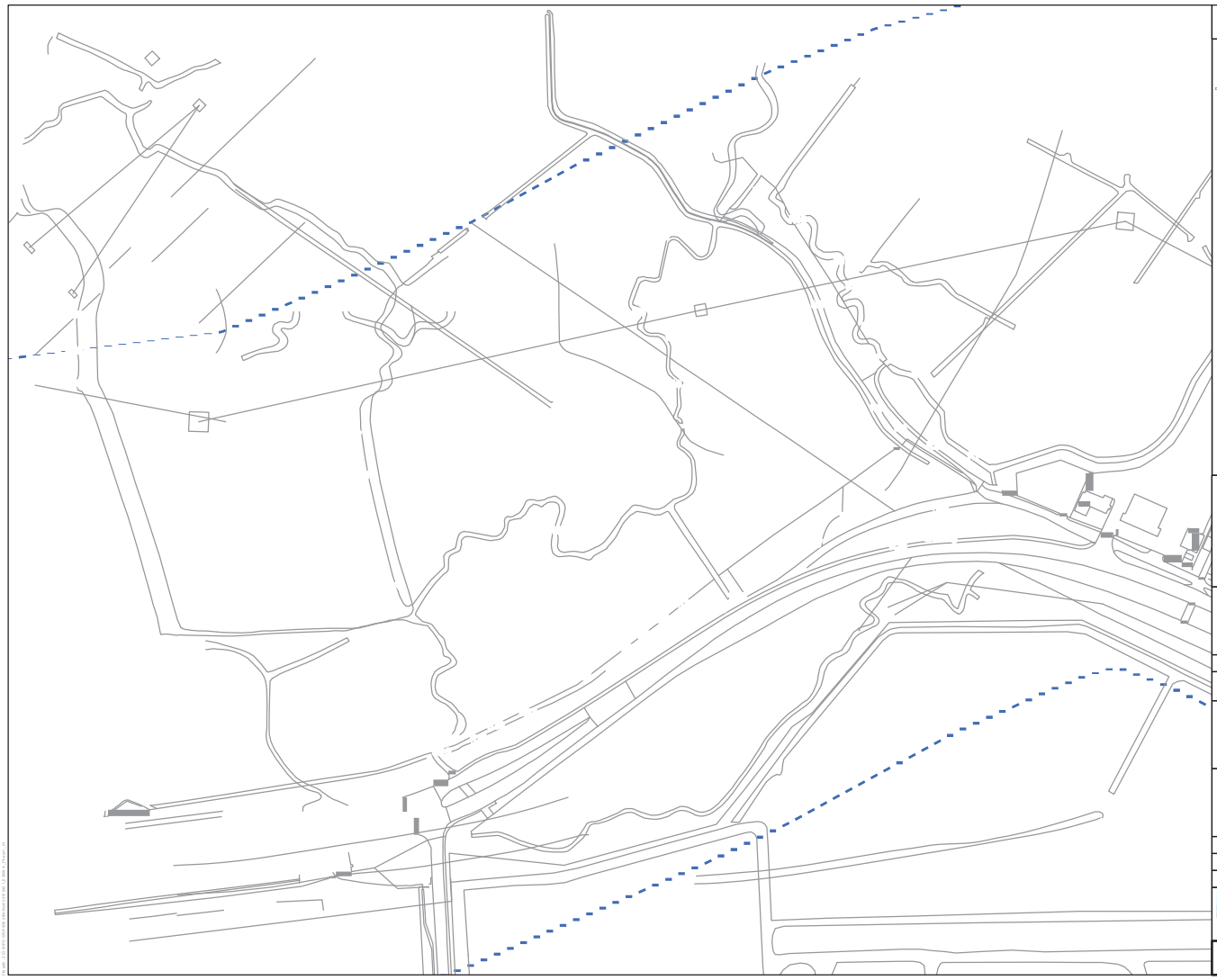
London, EC2M 4YE
Tel: 020 7337 1700 Fax: 020 7337 1701



Drawing Number

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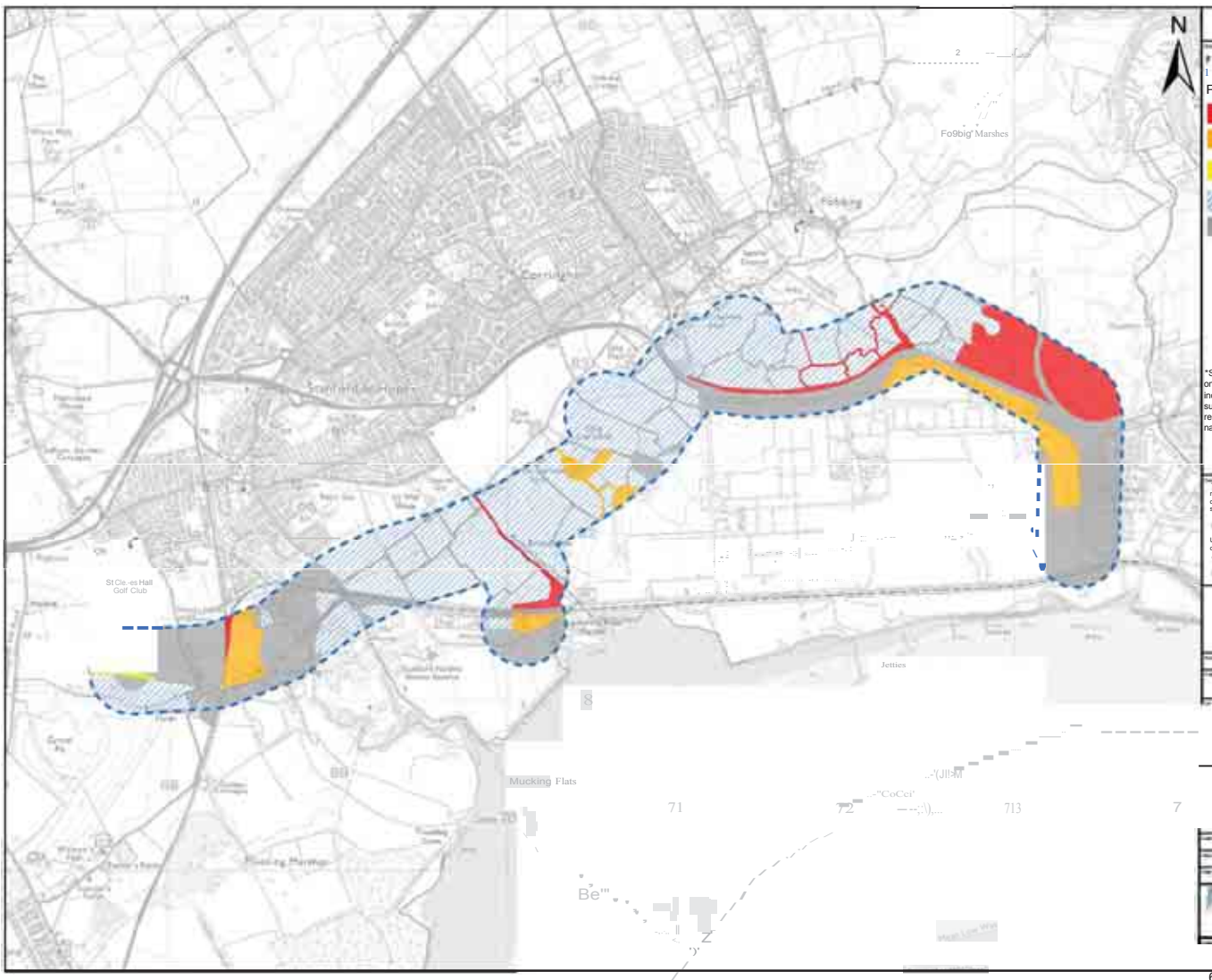
FIGURE 5: REPTILE POPULATION DENSITY



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FINAL

Gateway Energy Centre

Slow Worm

Population Estimation

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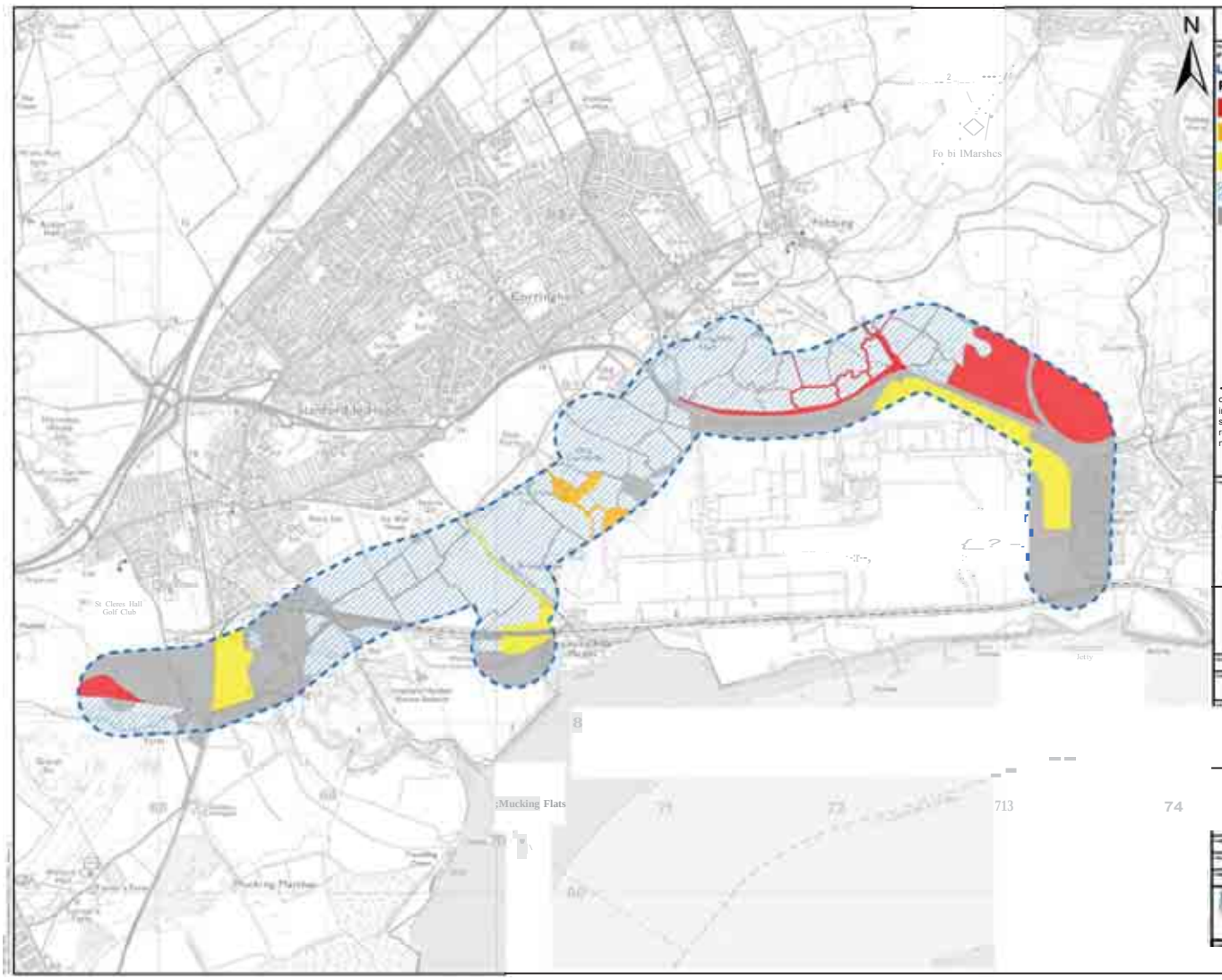

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Total Survey Area

Population Estimation

- Large
- Medium
- Suitable but not present
- Not Suitable
- Not Surveyed*

• Survey effort was designed to focus on habitats intermittently along the indicative route and not the whole survey area. This is Justified by the relatively small scale and temporary nature of predicted impacts

100 2:10 300 40J 000
Metres

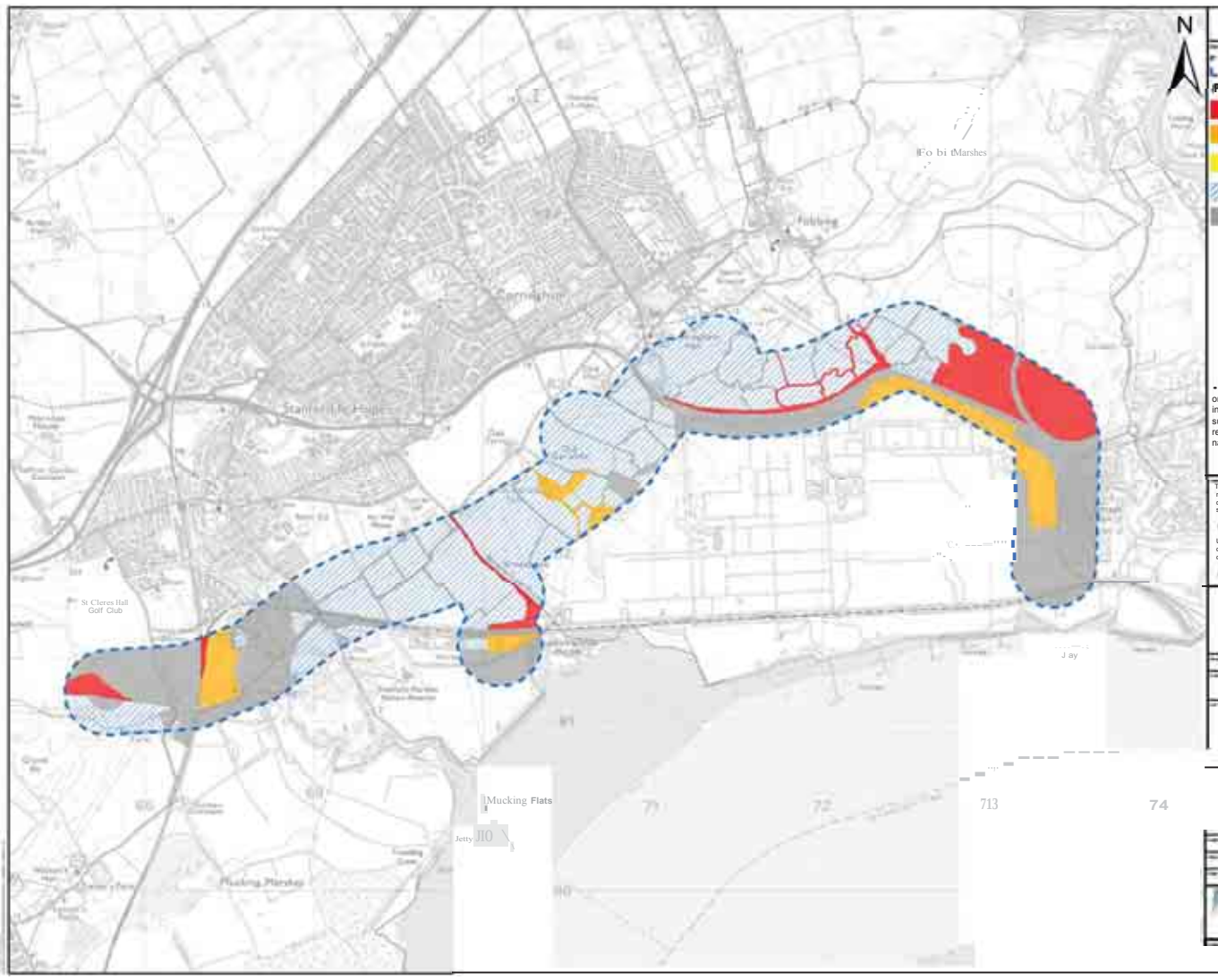
FINAL

Gateway Energy Centre

Adder Population Estimation

PB PARSONS BRINCKERHOFF

63958A_RPTL_POP_02



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WRITTEN DIMENSIONS SHALL BE USED

Total Survey Area

Population Estimation

- Large
- Medium
- Suitable but not present
- Not Suitable
- Not Surveyed*

* Survey effort was designed to focus on habitats intermittently along the indicative route and not the whole survey area. This is Justified by the relatively small scale and temporary nature of predicted impacts

100 2:10 300 40J 000
Metres

FINAL

Gateway Energy Centre

Common Lizard Population Estimation

PB PARSONS BRINCKERHOFF

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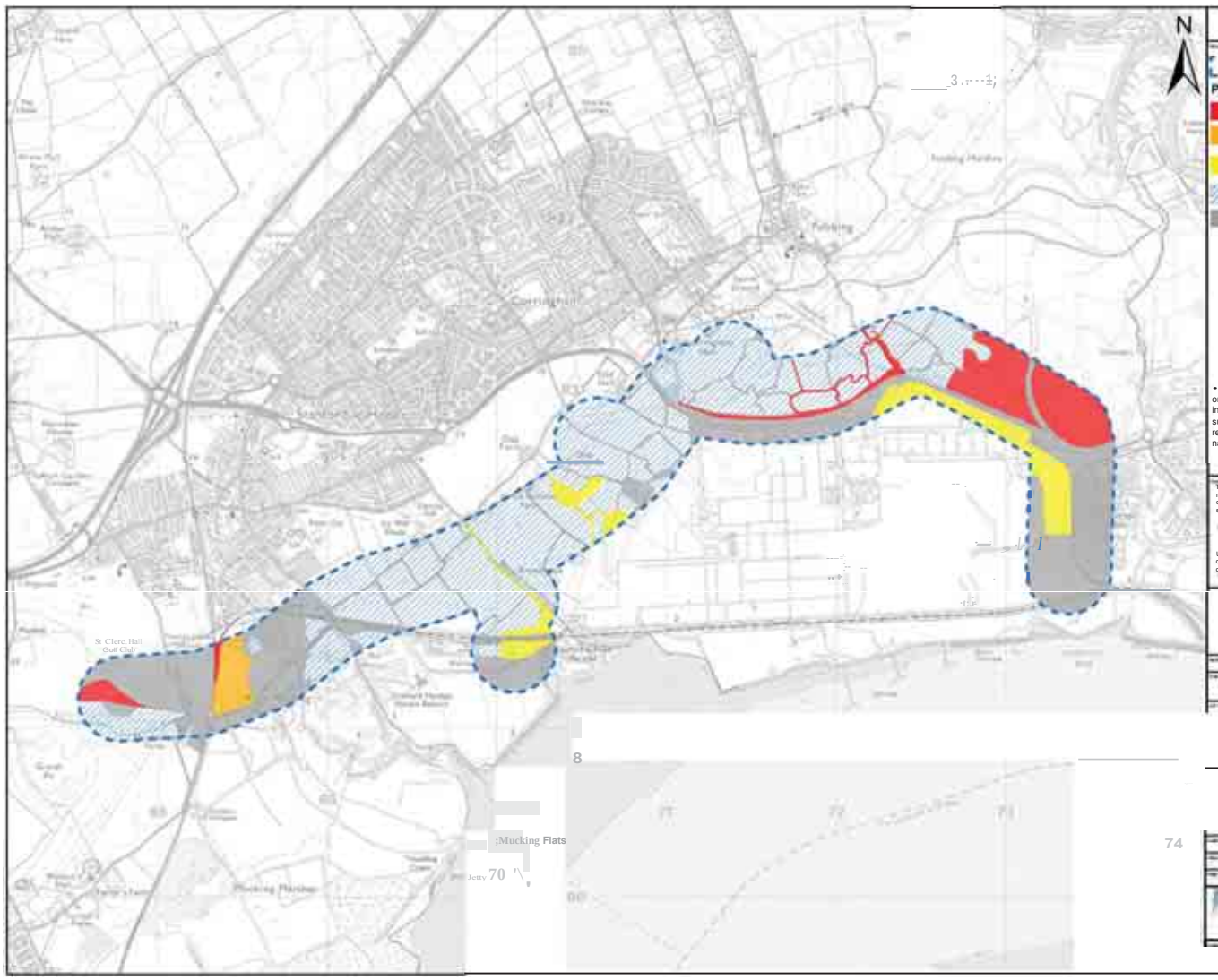


THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED

- Survey effort was designed to focus on habitats intermittently along the indicative route and not the whole survey area. This is Justified by the relatively small scale and temporary nature of predicted impacts

100 2:10 300 40J 000
Metres

2010

FINAL

Thames Haven
Gateway Energy Centre

Grass Snake
Population Estimation

PARSONS BRINCKERHOFF

63958A_RPTL_POP_04

APPENDIX

RAW DATA: RESULT FOR REPTILE SURVEYS UNDERTAKEN BY PB IN 2010

Reptile Recording Form

Date: 17.05.2010

Key:	**SW**	Slow Worm	**GS**	Grass Snake
	SS	Smooth Snake	**SL**	Sand Lizard
	CL	Common Lizard	**AD**	Adder

Sex key:	**M**	Male	**Age key:**	**H**	Hatchling (few days-few weeks old, totally black)	
	F	Female		**J**	Juvenile	**A** Adult

Area:	2	North of Manorway	5	Excel Land	**1**	GCN Ponds
	3	Great garlands Farm	4	Rainbow Lane		F.Factory

Refuge Number/ Location	**Species**	**Sex**	**Age**	**Notes**
	AD		A	
R1	GS		A	
R6	AD		J	

Reptile Recording Form

Date: 26.05.2010

Key:	**SW**	Slow Worm	**GS**	Grass Snake
	SS	Smooth Snake	**SL**	Sand Lizard
	CL	Common Lizard	**AD**	Adder

Sex key:	**M**	Male	**Age key:**	**H**	Hatchling (few days-few weeks old, totally black)	
	F	Female		**J**	Juvenile	**A** Adult

Area:	2	North of Manorway	5	Excel Lan	**1**	GCN Ponds
	3	Great garlands Farm	4	Rainbow Lane and fertiliser Factory		

Refuge Number/ Location	**Species**	**Sex**	**Age**	**Notes**
	AD		4 x A	
R1	GS		A	
R6	AD		J	
R4	GS		?	
R4	CL		A	

Reptile Recording Form

Date: 03.06.10

Key:	**SW**	Slow Worm	**GS**	Grass Snake
	SS	Smooth Snake	**SL**	Sand Lizard
	CL	Common Lizard	**AD**	Adder

Sex key:	**M**	Male	**Age key:**	**H**	Hatchling (few days-few weeks old, totally black)
	F	Female		**J**	Juvenile **A** Adult

Area:	2	North of Manorway	5	Excel Land	**1** GCN Ponds
	3	Great garlands Farm	4	Rainbow Lane and fertiliser Factory	

Refuge Number/ Location	Species	Sex	Age	Notes
M1	SW	M	A	
R1	SW	F	A	
R3	SW	2 x F	A	
R3	SW	M	A	
R7	SW	2 x F	A	
M4	SW	2 x M	A	
M4	SW	F	A	
R62	SW	F	A	
M14	SW	F & M	A	
R63	SW	M	A	
M15	SW			Reptile tin has been moved
R64	SW	M	A	
R65	SW	M	A	
R66	SW	F & M	A	
R67	SW	F	A	
R68	SW	2 x F	A	
R69	SW		J	
R70	SW	F	A	
R72	SW	2 x M	A	
	SW	M	A	
R74	SW		J	
R78	SW	F	A	
M16	SW	M	A	
R37	SW	M	A	
M8	SW	M	A	
	SW	M	A	
R24	SW	F	A	
R25	SW	F	A	
R22	SW	F	A	
R21	SW	M	A	
R 19	SW	F	A	
R48	SW	2 x F	A	
M2	SW			Reptile tin destroyed by trimmer
R28	SW			Reptile tin destroyed by trimmer
R30	SW			Reptile tin destroyed by trimmer
R31	SW			Reptile tin destroyed by trimmer
R33	SW			Reptile tin destroyed by trimmer
R34	SW			Reptile tin destroyed by trimmer
R35	SW			Reptile tin destroyed by trimmer
R36	SW			Reptile tin destroyed by trimmer

Refuge Number	Species	Sex	Age Class	Notes
R37	SW			Reptile tin destroyed by trimmer
R38	SW			Reptile tin destroyed by trimmer
R39	SW			Reptile tin destroyed by trimmer
R40	SW			Reptile tin destroyed by trimmer
R2	SW			
R5	SW	M	A	
	SW	M	A	
R15	SW	F	A	
R15	SW	F	A	
R20	CL		A	
R22	CL		A	

Reptile Recording Form

Date: 04.06.2010

Key:	**SW**	Slow Worm	**GS**	Grass Snake
	SS	Smooth Snake	**SL**	Sand Lizard
	CL	Common Lizard	**AD**	Adder

Sex key:	**M**	Male	**Age key:**	**H**	Hatchling (few days-few weeks old, totally black)
	F	Female		**J**	Juvenile **A** Adult

Area:	2	North of Manorway	5	Excel Land	**1**	GCN Ponds
	3	Great garlands Farm	4	Rainbow Lane and fertiliser Factory		

Refuge Number/ Location	Species	Sex	Age	Notes
	AD		4 x A	
R1	GS		A	
R2	CL		A	
	SW	M	A	
	SW	F	A	
M4	GS		J	
R21	SW	F	A	
R25	SW	F	A	
R29	SW	M	A	
R30	SW	M	A	
M20	SW	3 x F	A	
R 60	SW	F	A	
R69	SW	M	A	
	AD		A	Basking on top of bitumen felt tin
R22	SW	F	A	
R44	SW	M	A	
M3	SW	F	A	
	CL		A	On top of matt
M1	SW	M	A	
R1	SW	F	A	
R2	SW	F	A	
	SW	2 x M	A	
R3	SW	F	A	
R4	SW	F	A	
	SW		J	
R5	SW	M	A	
R12	SW	M	A	
R15	SW	M	A	
R18	CL		A	
R15	SW	F	A	
R31	CL		A	

Reptile Recording Form

Date: 08.06.2010

Key:	**SW**	Slow Worm	**GS**	Grass Snake
	SS	Smooth Snake	**SL**	Sand Lizard
	CL	Common Lizard	**AD**	Adder

Sex key:	**M**	Male	**Age key:**	**H**	Hatchling (few days-few weeks old, totally black)
	F	Female		**J**	Juvenile **A** Adult

Area:	2	North of Manorway	5	Excel Land	**1** GCN Ponds
	3	Great garlands Farm	4	Rainbow Lane and fertiliser Factory	

Refuge Number/ Location	Species	Sex	Age	Notes
M1	GS		J	
	SW	F	A	
R3	SW	3 x M	A	
M2	SW	F	A	
	SW	2 x M	A	
	SW	M	J	
	SW	F	A	
R5	SW	F	J	
R9	CL		A	
R13	SW	F	A	
	SW	F	A	
M4	SW	M	J	
	SW	M	A	
M3	SW	F	A	
R14	SW	M	A	
M6	SW	F	A	
R41	GS		J	
R45	SW	F	A	
R46	SW	M	A	
Grass	GS		A	
Grass	AD		A	
M11	SW	M	A	
R51	SW	M	A	
M12	CL	M	A	
R21	SW	F	A	
R22	SW	2 x M	A	
	AD		J	
R23	SW	2 x M	A	
	SW	2 x F	A	
	SW	2 x M	A	
R24	SW		J	
R32	SW	M	A	
R34	CL		A	
R35	SW	M	A	
R37	CL		A	
	CL		A	
M10	SW	2 x F	A	
M20	SW	4 x M	A	
R85	CL		A	
R84	CL		A	

Refuge Number	Species	Sex	Age Class	Notes
R83	SW	M	A	
R80	SW		J	
M18	SW	M	A	
R78	SW	M	A	
R77	SW	2 x M	A	
	SW	F	A	
R75	SW	M	A	
	SW	2 x M	A	
R74	SW	F	A	
	SW	2 x F	A	
R72	SW	M	A	
R70	SW	M	A	
	SW	M	A	
R69	SW	F	A	
R68	SW	F	A	
R66	SW	F	A	
R68	SW	F	A	
R66	SW	F	A	
R65	SW	F	A	
	SW	2 x M	A	
R64	SW	F	A	
M14	SW	M	A	
R60	SW	F	A	
R16				Shredded within the cow field
R17	SW	M	A	
R18				Shredded within the cow field
R3				Shredded within the cow field
R21				Shredded within the cow field
	AD		A	On top of matt
R22	SW	F	A	
R44	SW	M	A	
	CL		A	
M1	SW	M	A	
R1	SW	F	A	
R2	SW	F	A	
	SW	2 x M	A	
R3	SW	F	A	
R4	SW	F	A	
R5	SW		J	
R6	SW	F	A	
R12	SW	M	A	
R15	SW	M	A	
R18	CL		A	
R39	CL	M	A	
R40	SW	M	A	
R45	SW	F	A	
R44	SW	F	A	
R49	CL		A	
R50	SW		J	
R36	CL	F	A	Potentially pregnant

Reptile Recording Form

Date: 11.06.2010

Key:	**SW**	Slow Worm	**GS**	Grass Snake
	SS	Smooth Snake	**SL**	Sand Lizard
	CL	Common Lizard	**AD**	Adder

Sex key:	**M**	Male	**Age key:**	**H**	Hatchling (few days-few weeks old, totally black)
	F	Female		**J**	Juvenile **A** Adult

Area:	2	North of Manorway	5	Excel Land	**1** GCN Ponds
	3	Great garlands Farm	4	Rainbow Lane and fertiliser Factory	

Refuge Number/ Location	Species	Sex	Age	Notes
	SW	2 X F	A	
M1			J	
R1	SW	M	A	
	SW	F	A	
R2	SW		J	
R3	SW	M	A	
	SW	M	A	
R5	SW	2 x F	A	
R6	SW		J	
	SW	M	A	
M2	SW	2 x F	A	
R11	SW	M	A	
R12	SW		J	
	SW	3 x F	A	
M4	SW		J	
M5	SW	F	A	
R15	SW		J	
R17	CL		A	
R43	CL		A	
R45	SW	F	A	
R81	SW	F	A	
R64	SW	F	A	
R65	SW	F	A	
R66	SW		J	
R69	SW		2 x J	
R70	SW	F	A	
R71	SW		J	
R72	SW	M	A	
R73	SW	M	A	
R76	SW	F	A	
R77	SW	F	A	
R78	SW	F	A	
R79	SW	F	A	
R82	CL			
R83	SW	M	A	
R40	SW		J	
	SW	M	J	
R37	SW	M	A	
R35	SW	F	A	
R30	SW	F	A	

Refuge Number/ Location	Species	Sex	Age	Notes
R29	**SW**	**F**	**A**	
R20	SW	F	A	
R48	SW	F	A	
M1	SW	F	A	

Reptile Recording Form

Date: 14.06.2010

Key:	**SW**	Slow Worm	**GS**	Grass Snake
	SS	Smooth Snake	**SL**	Sand Lizard
	CL	Common Lizard	**AD**	Adder

Sex key:	**M**	Male	**Age key:**	**H**	Hatchling (few days-few weeks old, totally black)
	F	Female		**J**	Juvenile **A** Adult

Area:	2	North of Manorway	5	Excel Land	**1** GCN Ponds
	3	Great garlands Farm	4	Rainbow Lane and fertiliser Factory	

Refuge Number/ Location	Species	Sex	Age	Notes
	GS		2 x A	
R1	AD		A	
M1	SW	M	A	
	SW	F	A	
R2	SW	2 x M	A	
R3	SW	F	A	
R6	SW	F	J	
	SW	3 x F	A	
R5	SW	M	A	
M2	SW	F	A	
R9	SW		J	
R11	SW	M	A	
	SW	3 x F	A	
	SW	M	A	
M4	CL		A	
M5	SW	2 x F	A	
R17	SW	F	J	
M6	SW	M	A	
R18	CL	F	A	
R40	GS		J	
R45	SW	M	A	
R44	SW	M	A	
M11	SW	M	A	
R81	SW	F	A	
M15	SW	F	A	
R64	SW	M	A	
R65	SW	M	A	
R66	SW	F	A	
R67	SW	2 x M	A	
	SW		J	
R68	SW	2 x M	A	
	SW	2 x F	A	
	SW	M	A	
R69	SW		J	
R71	SW	M	A	
R72	SW	M	A	

Refuge Number/ Location	Species	Sex	Age	Notes
R74	SW	M	A	
R75	SW	M	A	
R81	SW	M	A	
R82	SW	M	A	
R83	SW	F	A	
R87	SW	M	A	
R87	**SW**		**J**	
M10	SW	F	A	
R40	SW	M	J	
R34	SW	F	A	
R33	SW	M	A	
R31	SW	M	A	
R29	SW	F	A	
R28	SW	M	J	
	SW	M	A	
R27	SW	F	A	
R22	SW	M	J	
M8	SW	6 x M	A	
	SW	F	A	
R24	SW	2 x M	A	
R17	SW	F	A	
R20	CL		A	
M2	CL	M	A	
R47	SW	F	A	
R48	SW	M	A	
M3	SW	F	A	
R31	SW	F	A	
R18	CL		A	
R16	CL		A	
R15	SW	F	A	
R10	SW		J	
R9	SW	F	A	
R6	SW	M	A	
R8	SW	2 x M	A	
	SW	2 x M	A	
R4	SW	F	A	
	CL		A	
R1	SW	F	A	
R1A	SW	F	A	
	SW	M	A	
M1	SW	F	A	
	SW	2 x F	A	
R15	SW	2 x M	A	
R18	CL		A	
M3	CL		A	
R20	CL	M	A	
R32	CL		A	
R29	CL		A	

Reptile Recording Form

Date: 16.06.2010

Key:	**SW**	Slow Worm	**GS**	Grass Snake
	SS	Smooth Snake	**SL**	Sand Lizard
	CL	Common Lizard	**AD**	Adder

Sex key:	**M**	Male	**Age key:**	**H**	Hatchling (few days-few weeks old, totally black)
	F	Female		**J**	Juvenile **A** Adult

Area:	2	North of Manorway	5	Excel Land	**1** GCN Ponds
	3	Great garlands Farm	4	Rainbow Lane and fertiliser Factory	

Refuge Number/ Location	**Species**	**Sex**	**Age**	**Notes**
	SW	2 x M	A	
M1	SW	2 x F	A	
	SW	2 x F	A	
	SW	2 x M	A	
R1	SW		J	
R2	SW	M	A	
R3	SW	2 x M	A	
	SW	2 x M	A	
R5	SW	2 x F	A	
R4	SW	2 x F	A	
	GS		J	
R7	SW	F	A	
R8	CL		A	
M3	CL		A	
	SW	M	A	
R10	SW		J	
R12	SW	2 x F	A	
R13	SW	M	A	
	SW	2 x F	A	
M4	AD		J	Snake skin found under matt
R14	SW	M	A	
M5	SW	M	A	
R17	SW		J	
M6	SW	M	A	
	SW	F	A	
M11	SW	M	A	
R51	SW	F	A	
R56	CL		A	
R57	SW	M	A	
	SW	2 x M	A	
R62	CL		A	
R64	SW	2 x M	A	
R65	SW	2 x F	A	
R70	SW	F	A	
R71	SW	F	A	
	SW	F	A	
R72	SW	M	A	
R75	SW		J	
R78	SW	M	A	
	SW	F	A	
R79	SW		J	
M18	AD	F	A	
Refuge Number/				

Notes

Location	Species	Sex	Age	Notes
R83	**SW**	**F**	**J**	
M20	SW	M	A	
R87	SW	F	A	
R88	SW	M	A	
	SW	2 x M	A	
M10	CL		A	
R40	SW	2 x F	A	
R38	SW		J	
R37	SW	F	A	
R31	SW	2 x M	A	
R30	SW	M	A	
R29	SW	F	A	
R27	SW	M	A	
R24	SW		J	
	SW	2 x M	A	
R21	CL		A	
M9	SW	M	A	
R50	SW	M		
R49	SW	2 x F	A	
R47	SW	M	A	
	SW	3 x F	A	
	SW	M	A	
M1	SW		J	
	SW	3 x F	A	
R1A	SW		J	
R1	SW	M	A	
	SW	2 x M	A	
R3	SW	2 x F	A	
	SW	2 x F	A	
R4	SW	2 x M	A	
R6	SW	M	A	
R7	SW	F	A	
R13	SW	M	A	
	SW	2 x F	A	
R15	SW		J	
R17	SW	M	A	
R19	SW		H	
R39	CL		A	
M3	SW	F	A	
	SW		J	
R48	CL		A	
R29	GS		A	
	SW	F	A	
	SW	2 x M	A	
M5	SW		J	

Reptile Recording Form

Date: 18.06.2010

Key:	**SW**	Slow Worm	**GS**	Grass Snake
	SS	Smooth Snake	**SL**	Sand Lizard
	CL	Common Lizard	**AD**	Adder

Sex key:	**M**	Male	**Age key:**	**H**	Hatchling (few days-few weeks old, totally black)
	F	Female		**J**	Juvenile **A** Adult

Area:	2	North of Manorway	5	Excel Land	**1** GCN Ponds
	3	Great garlands Farm	4	Rainbow Lane and fertiliser Factory	

Refuge Number/ Location	Species	Sex	Age	Notes
R1	SW	3 x F	J	
	SW	F	A	
R3	SW	3 x M	A	
R2	SW	F	J	
R5	SW	M	A	
R6	SW	M	A	
R7	SW	F	A	
M2	SW	F	A	
R11	SW	F	A	
R12	SW	F	A	
	AD		J	
	SW	F	A	
M4	SW	M	A	
R17	SW	F	J	
M6	CL		A	
R42	SW	F	A	
R46	SW	M	A	
R47	SW	M	A	
R52	SW	M	A	
R62	SW	F	A	
M14	AD		J	
R63	SW	F	A	
M15	SW	M	A	
R64	SW	F	A	
R66	SW	F	A	
R67	SW	M	A	
R69	SW	F	A	
R70	SW	F	A	
R71	SW	F	A	
	SW	2 x M	A	
R72	SW	F	A	
	SW		2 x J	
R73	SW	M	A	
R75	SW	F	A	
R76	SW	M	J	
R78	SW		J	
	SW	F	A	
R79	SW	J	A	
M18	AD		A	
	AD		J	
	SW	M	A	
R82	SW	2 x F	A	

Refuge Number/ Location	Species	Sex	Age	Notes
R 83	SW		2 x J	
M20	SW		J	
R88	SW	F	A	
M10	SW	F	A	
	SW	F	A	
R40	CL		A	
R37	CL		A	
R35	SW	M	A	
	SW	M	A	
R31	SW	F	A	
R30	SW	M	A	
	SW	F	A	
R29	SW		J	
R27	SW	M	A	
	SW	M	A	
R24	SW		J	
	SW		3 x J	
R21	CL		A	
Near R47	CL		A	On area of rocks near to R47
R42	AD		J	
M1	SW		J	
M1	SW	M	A	
	SW	M	A	
	SW	F	A	
R1A	SW		J	
R2	SW	M	A	
R3	SW	2 x M	A	
R4	SW	M	A	
R5	SW	M	A	
	SW	F	A	
	CL		A	
	SW	M	A	
R7	SW		J	
R12	SW		J	
R15	SW	F	A	
R20	SW		J	
R22	SW	F	A	
R26				Missing / Destroyed
R28	SW	M	A	
R31	SW	F	A	
R39	SW		J	
R46	CL		A	Underneath matt
M3	SW	2 x F	A	
	SW	M	A	
R18	SW	F	A	
M6	CL		A	
R29	CL		A	
R31	CL	F	A	
	SW	F	A	
M5	SW	M	A	
R32	SW	F	A	
R21	CL		A	
M3	CL	M?	A	
R18	CL	F?	A	
	SW	F	J	
	SW	2 x F	A	
R15	SW	M	A	

Reptile Recording Form

Date: 22.06.2010

Key:	**SW**	Slow Worm	**GS**	Grass Snake
	SS	Smooth Snake	**SL**	Sand Lizard
	CL	Common Lizard	**AD**	Adder

Sex key:	**M**	Male	**Age key:**	**H**	Hatchling (few days-few weeks old, totally black)
	F	Female		**J**	Juvenile **A** Adult

Area:	2	North of Manorway	5	Excel Land	**1** GCN Ponds
	3	Great garlands Farm	4	Rainbow Lane and fertiliser Factory	

Refuge Number/ Location	Species	Sex	Age	Notes
R1	SW	M	A	
R3	SW	M	A	
	SW	2 x M	A	
R2	SW	F	J	
	SW	M	A	
	SW	2 x F	A	
R5	SW		J	
R6	SW	2 x F	J	
R7	SW	F	A	
R13	SW	F	A	
	AD		J	
M4	SW	F	A	
R14	AD		A	
	CL		A	
M5	SW	M	A	
R17	SW	F	J	
M6	SW	M	A	
R41	CL		A	
R45	SW	F	A	
M11	SW	F	A	
R81	SW	F	A	
R53	GS		J	
R63	SW	M	A	
R64	SW	M	A	
R65	SW	M	A	
R70	SW	F	A	
R72	SW	F	A	
R73	SW	F	A	
	SW	F	A	
R74	SW		J	
R78	SW	M	A	
M16	AD		A	
M18	SW	M	A	
	SW	M	A	
R80	SW		J	
R82	AD		J	
R83	SW	2 x M	A	
M19	AD		J	
R85	CL		A	
M20	SW	2 x M	A	
Near R86	CL		A	
R87	CL		A	

Refuge Number/ Location	Species	Sex	Age	Notes
M10	SW	F	A	
R40	SW		J	
	SW	M	A	
R36	CL		A	
R33	SW	F	A	
R31	SW	F	A	
	SW	F	A	
R24	SW	M	A	
R21	SW	2 x M	A	
	SW	F	A	
	SW		J	
M1	SW	F	A	
R8	SW	M	A	
R42	SW	F	A	
R43	AD		J	
R48	SW	F	A	
R50	AD		J	
	SW	F	A	
M1	SW		J	
R1A	SW	F	A	
	SW	M	A	
R2	SW	F	A	
R5	CL		A	
R7	SW	M	A	
R38	SW	F	A	
	SW	2 x F	A	
IM18	SW	M	A	
IR16	SW	F	A	
IR6	CL		2 x A	
IR24	SW	F	A	
	SW	M	A	
R15	SW	F	A	
	CL	M	A	
R18	CL	F	A	
	CL	M	A	
M3	CL	F	A	
R29	CL	M	A	
R32	SW	F	A	
R23	SW	F	J	

Reptile Recording Form

Date: 22.06.2010

Key:	**SW**	Slow Worm	**GS**	Grass Snake
	SS	Smooth Snake	**SL**	Sand Lizard
	CL	Common Lizard	**AD**	Adder

Sex key:	**M**	Male	**Age key:**	**H**	Hatchling (few days-few weeks old, totally black)
	F	Female		**J**	Juvenile **A** Adult

Area:	2	North of Manorway	5	Excel Land	**1** GCN Ponds
	3	Great garlands Farm	4	Rainbow Lane and fertiliser Factory	

Refuge Number/ Location	Species	Sex	Age	Notes
IR6	CL		2 x A	
IR24	SW	F	A	

F.5 Phase II Water Vole Survey Report

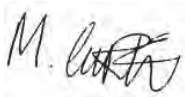
Phase II Water Vole Report: Gateway Energy Centre Gas and Grid Connection Routes

InterGen

November 2010

PARSONS BRINCKERHOFF

PB 125 YEARS

Report Title	**:**	**Phase II Water Vole Survey: Gateway Energy Centre Gas and Grid Connection Routes**
Job No	**:**	**63958A**
Date	**:**	**November 2010**
		
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Document History and Status

Report Issue	Date of Issue	Prepared By:	Checked By:	Approved By:

CONTENTS

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Parsons Brinckerhoff Ltd (PB) was commissioned by InterGen to undertake a detailed Water Vole survey south and east of Stanford-le-Hope, Essex, to inform the construction of the proposed gas pipeline and associated AGI / electrical connection and sub-station associated with the Gateway Energy Centre Combined Cycle Gas Turbine (CCGT) Power Station (GEC).

The exact alignment / routes and locations of the proposed gas pipeline and associated AGI / electrical connection and sub-station have yet to be finalised. However, the indicative alignment / routes and locations have been established and form the basis of this assessment. The survey area encompasses a 250 m buffer either side of an indicative approximate 7.7 km long gas pipeline and 6 km long electrical connection. The survey area is situated between TQ 677 810 and TQ 732 817. The habitat is dominated by arable, grazing marsh and brownfield sites, separated by a large branching network of hedgerows with waterbodies present throughout. Water bodies that are suitable to support water voles are located throughout the survey area.

The presence of water voles within the local area was first identified by Ecological Services Limited (ESL) in 2001 / 2002. Further targeted water vole surveys were carried out by ESL in 2006, in 2007 by Cambridge Ecology, and most recently by Thomson Ecology in 2008. Thomson Ecology surveyed all land within the LG Development boundary and the habitat enhancement areas the Northern Triangle (east and west), and Great Garlands Farm.

PB undertook water vole surveys on all water bodies within the survey area that had not been previously surveyed, or where no evidence of water voles had been found in the 2008 surveys. The Thomson and PB data combined covers all water bodies located within the 500 m wide survey area.

A total of 104 water bodies were recorded within the survey area. Evidence of water voles was found in 42 water bodies indicating their likely presence along the entire length of the indicative route. A further 38 water bodies were found to be suitable to support water voles but no evidence was recorded and eight water bodies were found to be unsuitable for water voles at the time of the survey. The remaining 16 water bodies were not surveyed due to access restrictions or because they were present within Area 2. Area 2 will not be affected by the proposed development but is known to support water voles.

Due to the temporary nature of the proposed development and the narrow footprint area, it is considered that water voles occurring within the local area will not be significantly affected. However, under the current plans it is likely that up to 17 water bodies considered suitable to support water voles would be directly affected by the pipeline, resulting in habitat loss, fragmentation, and localised disturbance. Should the route change significantly, it is possible that further water bodies may be impacted.

The construction of the AGI and sub-station is likely to result in permanent land-take. However, the preferred locations are all located within arable fields that are considered unsuitable to support water voles and not within 10 m of a water body. However, substation option 5b may result in the temporary disturbance of two water bodies with potential to support water voles. National Grid will undertake a more detailed assessment of the preferred substation options once the detailed design has been finalised.

Where the excavation route bisects water bodies considered suitable to support water voles, it is recommended that the water body should undergo habitat manipulation to temporarily exclude water voles from the working corridor. The water bodies should then be temporarily drained and blocked. On completion of the pipeline, it is recommended that the habitat is restored to the same condition prior to development.

It is not considered likely that the development will result in any long term negative impacts on local water vole populations.

SECTION 1

INTRODUCTION

1 INTRODUCTION

1.1 Overview

1.1.1 Parsons Brinckerhoff Ltd (PB) was commissioned by InterGen to undertake detailed protected species surveys within an area south and east of Stanford-le-Hope, Essex. The assessment will inform the construction of the proposed gas pipeline and associated AGI / electrical connection and sub-station associated with the Gateway Energy Centre Combined Cycle Gas Turbine (CCGT) Power Station (GEC).

1.1.2 It was identified within the Ecological Scoping Assessment (PB 2010) that water vole (*Arvicola terrestris*) surveys should be undertaken of all suitable water bodies that could be affected by the proposed development.

1.1.3 A combination of previously collected data from Thomson Ecology (2008) to inform the London Gateway (LG) Development and data collected in 2010 by PB has been assessed to predict the potential impacts on water voles.

1.1.4 The assessment undertaken is based on currently available information regarding routing, working width and AGI / substation location (as shown on Figure 1).

1.2 Site Context

1.2.1 GEC will be location on land within the LD Development.

1.2.2 The GEC site is situated on the north bank of the Thames Estuary and lies approximately 6 km east of the A13. The A1014 dual carriageway (The Manorway) is located to the north of the site and runs east to west to provide a link with the A13, which in turn links in with the M25 at Junction 30. The River Thames runs in a west to east direction to the south of the site where DP World has recently commenced works on the new port facility associated with the LG Development.

1.2.3 The nearest residential settlements to the GEC site are at Stanford-le-Hope, Corringham and Fobbing which lie approximately 4 km to the west, Canvey Island approximately 5 km to the east, and Basildon approximately 7 km to the north.

1.2.4 To the east of the GEC site is the existing Coryton CCGT Power Station (700 m east), Shell Aviation Fuel Storage Farm and Petroplus' Coryton Oil Refinery (950 m east).

1.2.5 The LG Development comprises a deep-sea global container shipping port (LG Port) and a logistics and commercial centre (LG Logistics and Business Park). These are currently being developed on the site of the former Shell Oil Refinery at Shell Haven near Corringham and Stanford-le-Hope (Essex) on the northern banks of the Thames Estuary.

1.2.6 Prior to planning permission being granted, detailed ecological surveys were undertaken within the LG Development footprint and its immediate surroundings.

1.2.7 The underground gas pipeline and associated AGI are required to deliver the natural gas to be used as fuel by the gas turbines at GEC. At the AGI (OS Grid reference TQ 677 810), the natural gas will be taken from a connection to the existing National Grid National Transmission System (NTaS) Number 5 Feeder pipeline.

1.2.8 From the AGI, the underground gas pipeline will cross a range of arable, marsh and brownfield habitats and an area of land designated as a protected species receptor site for the LG Development, eventually connecting to GEC (OS Grid reference TQ 732 817) (see Figure 1). The underground gas pipeline will be laid using a combination of both surface excavation and horizontal directional drilling (HDD). The pipe is expected to measure approximately 16 inches in diameter and will be laid at a depth of approximately 1.2 m, using a working corridor of approximately 30 m where HDD is not used. Works are proposed to commence in either 2012 or 2013 and will take approximately six to nine months to complete.

1.2.9 If the electrical connection is over ground, it is likely to be fitted to new overhead pylons. It will run for approximately 6 km from GEC to a sub-station to be consented and constructed by National Grid. At the time of writing there are four possible sub-station locations, all situated to the west of the GEC site. All four possible locations have been included within this assessment (Figure 1). However, it should be noted, that a separate detailed assessment of the four sub-station locations, the inter-connecting cabling and all associated infrastructure is being undertaken independently of this assessment.

1.2.10 The exact alignment / routes and locations of the proposed gas pipeline and associated AGI / electrical connection and sub-station have yet to be finalised. However, the indicative alignment / routes and locations have been established and form the basis of this assessment. The indicative route for the gas pipeline and electricity connection will follow the alignment of an existing CECL Power Station gas pipeline as it is most likely that they will be laid as close to one another as possible to allow for easy management and maintenance. The 'proposed development' for the purposes of this Document therefore includes the gas pipeline and associated AGI / electrical connection and 4 preferred sub-stations.

1.2.11 The presence of water voles within the local area was identified by Ecological Services Limited (ESL) in 2001 / 2002 during an initial ecological appraisal to inform the LG Development. Further targeted water vole surveys were carried out by ESL in 2006 and in 2007 by Cambridge Ecology, and more recently by Thomson Ecology in 2008.

1.2.12 The majority of the proposed development is located outside of, but in close proximity to, the LG Development, and as such many of the water bodies located within the survey area have been previously surveyed for water voles by Thomson Ecology. Much of the data collated by Thompson Ecology for the LG Development is therefore relevant to this assessment and has been used to form its baseline.

1.2.13 Any water bodies within the survey area of this assessment that were not surveyed by Thomson Ecology in 2008 were surveyed and assessed by PB in 2010. The Thomson Ecology and PB surveys together, ensure that every water body located 250 m either side of the proposed development have been surveyed. This is defined as the survey area and is considered sufficiently broad to inform this assessment and to allow for any minor amendments to the route to be made.

1.2.14 The LG Development site contains a large number of water bodies, many of which were found to support water voles in 2008. However, it is unlikely that water voles will be present within the LG Development site at the time of construction, as the LG Development site is currently undergoing a large scale translocation programme to remove water voles to the designated receptor sites. The receptor sites are located on-site within the Northern Triangle (west section); located immediately north of the site; and located at West Canvey Marshes, north-west of the site (Figure 2). Water voles have also been translocated from site A, located immediately south of Stanford-le-Hope industrial estate as the area was flooded as part of the LG Development mitigation measures for wintering birds.

1.2.15 The translocation works commenced in 2008 and are planned to continue until 2011. This report takes into consideration the potential for increased populations within the designated receptor areas.

1.3 Legislation and Planning Context

1.3.1 Water voles are protected under the Wildlife and Countryside Act (1981, as amended). It is an offence to possess, control or sell water voles or to intentionally kill, injure or take water voles. It is also an offence to intentionally or recklessly

damage, destroy or obstruct access to a place that water voles use for shelter or protection or disturb water voles whilst using such a place.

1.3.2 If a development activity is likely to result in a relevant offence (i.e. disturb water voles or their burrows, trap individuals, and also to undertake certain aspects of intrusive survey work), a licence will usually be required from the relevant statutory body (in this case, Natural England).

1.3.3 Water voles are listed on both the UKBAP and Essex BAP, which makes them a priority species for conservation in both areas.

SECTION 2

METHODOLOGY

2 METHODOLOGY

2.1 Introduction

2.1.1 To facilitate the assessment, the survey area has been divided into five distinct 'Areas'. Areas 2 to 5 (5 being the LG Development site itself) were surveyed in 2008 by Thomson Ecology , Area 1 was surveyed by PB in 2010 and Area 4 was re-surveyed by PB in 2010 (refer to Figure 1).

2.1.2 Many of the water bodies within Area 4 were considered not suitable to support water voles in 2008, and were not surveyed by Thomson Ecology. However, following the initial walkover completed by PB in 2010 certain water bodies that had not been previously surveyed were identified as being suitable to support water voles. These water bodies were surveyed by PB in 2010. Any water bodies that were found to support only a limited number of signs indicating water vole presence in 2008 were also re-surveyed by PB in 2010.

2.1.3 The number and the colour allocated to each water body by Thomson Ecology has been used in this assessment to ensure consistency and to allow the data from the two surveys to be compared.

2.1.4 PB identified six previously un-surveyed water bodies as being suitable to support water voles (all within Area 1). These water bodies were numbered 1-6 and have been allocated the prefix red. A further 14 water bodies that were previously considered unsuitable for water voles, or where no water vole evidence was found in 2008 were surveyed in 2010.

2.2 Desk Study

2.2.1 The Phase I habitat survey undertaken as part of the Environmental Scoping Report (PB 2010) contained a full desk study, which was used for this assessment. Information regarding previous surveys within the area was also reviewed (Thomson Ecology 2008).

2.3 Field Survey

2.3.1 The water vole surveys undertaken in 2008 by Thomson Ecology and 2010 by PB followed guidance set out in Strachan and Moorhouse (2006). PB Ecologists Jason Brown and Marianne Curtis undertook the water vole survey on 17th June 2010.

2.3.2 Surveyors walked along the margins of the water bodies within the survey area, looking for signs indicating the presence of water voles:

2.3.3 Direct observations of water voles included: latrines; burrows (including those both above and below water level); footprints; small mammal runs; pathways within the vegetation; feeding remains; the distinctive 'plop' sound of water voles entering the water; and, feeding 'lawns' around tunnel entrances.

2.3.4 Field signs were mapped and tallied.

2.4 Survey Limitations

2.4.1 It was not possible to access twelve water bodies located within Coryton Oil Refinery and Coryton Power Station (CECL Power Station) property. This is not likely to affect the results as the indicative route is currently planned to occur outside of these areas, and plans are unlikely to alter dramatically at this point along the proposed routes. Therefore, the omission of these twelve water bodies is considered unlikely to significantly affect the validity of the assessment.

2.4.2 The original data by Thomson Ecology (2008) was unavailable at the time this report was written. Maps produced from the original data were obtained; however this data

was did not allow population estimations to be calculated. Drawing on professional experience and the adoption of a precautionary approach, the obtained data was considered suitable to inform the baseline of this report.

2.4.3 Details of the current water vole population size within the Northern Triangle (east and west) Receptor Site were unavailable at the time of writing. However, the planned number of individuals to be released and the known carrying capacity of the site enable an accurate indication of likely population. Therefore, the lack of information does not affect the robustness of this assessment.

2.4.4 A number of new water bodies located within the Northern Triangle Receptor Site were not surveyed as water voles are currently being translocated into the area under the current Ecological Management Plan (Thomson, 2008). For the purposes of this assessment water voles are considered to occur throughout the Northern Triangle Receptor Site.

2.4.5 The survey was undertaken during the summer months; vegetation alongside the water can become dense and can limit visibility of the embankment. These dense sections were covered by spot checks every 10 m. On a precautionary basis any such water bodies, where evidence was not recorded, where assessed to have potential to support water voles.

2.4.6 Within the Thomson Ecology report certain water bodies were classified as a single water body due to their close proximity to one another. This is not considered likely to affect the outcome of this assessment, and comparison between the separate reports is still possible.

SECTION 3

RESULTS

3 RESULTS

3.1 Desk Study

3.1.1 The Ecological Scoping Report (PB 2010) confirmed that water voles have been previously recorded within the local area and identified the survey area as being suitable for use by water voles.

3.2 Field Survey

3.2.1 A total of 104 water bodies are present within the survey area consisting of ditches, ponds, and transient pools of water.

3.2.2 The survey area is divided into five areas as represented within Figure 1. Area 1 comprised of eight water bodies and was surveyed in 2010 by PB. Area 2 comprised of 13 water bodies, some of which are used as fishing lakes, and a nature reserve which is known to support water voles. Areas 3-5 comprised of 83 water bodies, most of which were surveyed in 2008 by Thomson Ecology.

Area 1

3.2.3 A total of seven ponds and one connecting ditch occur within Area 1.

3.2.4 The water bodies comprised of a mixture of permanent (Red 1-3, & 6, and Green 116 & 179) and non-permanent water bodies (Red 4 & 5). All water bodies supported submerged and emergent vegetation, including reedmace (Typha latifolia). The banks of all water bodies were dominated by grasses and surrounded by a large area of unmanaged grassland and scrub.

3.2.5 Six of the water bodies located within Area 1 were considered suitable to support water voles, however no evidence of water voles was found within or surrounding any of these water bodies (Figure 4). The remaining two water bodies were not considered suitable to support water voles during the 2010 surveys.

Area 2

3.2.6 A total of 13 water bodies occur within Area 2 comprising a mixture of drainage ditches, ponds, reed beds and large lakes used for commercial fishing.

3.2.7 It is known that water voles occur throughout Area 2 as they have been recorded within and around the Stanford Warren Nature Reserve.

3.2.8 The pipeline will be laid using HDD technology throughout this area and no cabling or AGI / substation is proposed. There will be no direct or indirect impacts upon any of the water bodies; as such they were not subjected to detailed surveys.

Area 3

3.2.9 A total of 22 water bodies were identified within Area 3, these comprised a network of ditches and two farmland ponds.

3.2.10 Of the 22, evidence of water voles was recorded in 11 (Figures 5 and 6). A further five water bodies were considered suitable to support water voles; however no evidence of water vole usage was recorded during the surveys. The final six water bodies were not considered suitable to support water voles when surveyed in 2010, these were therefore not surveyed.

3.2.11 Water bodies blue 1, 9 and 12 / Orange 125 located within Area 3 had little or no signs of water vole when surveyed within 2008 (Figure 5) were re-surveyed in 2010 by PB ecologists. No conclusive evidence of water voles was found within these water bodies. However, several signs, which could indicate water vole presence were recorded, such as mammal runs, therefore potential presence could not be ruled out, see Table 3.1 for details.

TABLE 3.1: SUMMARY TABLE OF 2010 WATER VOLE SURVEY FINDINGS WITHIN AREA 3

Waterbody number	Description of Waterbody	Description of Field Signs Found
Blue 1*	Ditch separating cattle fields. Shallow water present. The vegetation within the ditch showed signs of recent management.	A mammal run was recorded; however, it was not conclusively water vole. No latrines, burrows, or feeding stations were observed.
Blue 9	Ditch separating cattle fields. Shallow water present. The vegetation within the ditch showed signs of recent management.	A mammal run was recorded along the north bank; however, it was not conclusively water vole. No latrines, burrows, or feeding stations were observed
Blue 12 / Orange 125	Wide ditch separating cattle fields, containing water. The ditch had sparse marginal vegetation which had recently been cut.	No conclusive signs of water voles were recorded along the margins of the ditch. No latrines, burrows, or feeding stations were observed

* *Please refer to Figure 6 for the locations of the water body.*

3.2.12 A high frequency of water vole signs were identified within the Thomson Ecology survey (2008) particularly towards the east of Area 3 in the water bodies directly surrounding Great Garlands Farm Elbow Receptor Site (Figure 5).

Area 4

3.2.13 A total of 30 water bodies were identified within Area 4, of these, 23 contained evidence of water voles (Figure 5 & 6 and Table 3.2). The water bodies comprised mainly of a network of highly connected ditches, of which four were considered suitable to support water voles, however no evidence of water vole usage was recorded during the surveys. A further three water bodies were not assessed during the surveys, however, these occur within the Northern Triangle Receptor Area, where water voles have been translocated from the LG Development area. Based on a precautionary approach, these three un-surveyed water bodies are therefore assumed to support water voles.

TABLE 3.2: SUMMARY TABLE OF 2010 WATER VOLE SURVEY FINDINGS WITHIN AREA 4

Waterbody number	Description of Waterbody	Description of Field Signs Found
Green 31	Ditch separating arable fields containing water, and a continuous stand of common reed (*Phragmites australis*).	Water vole signs well distributed along both sides of ditch. A total of six burrows, all considered to be recently utilised. Five mammal runs were located along the sides of the ditch, and four piles of feeding remains were observed.
Green 32	Ditch separating arable fields containing water, and a continuous stand of common reed.	Water vole signs were observed along both sides of ditch. A total of three burrows, all considered to be recently utilised. Three mammal runs were located along the sides of the ditch, and two piles of feeding remains were observed.
Green 36 / 36a	Ditch separating arable fields containing water, and a continuous stand of common reed.	Water vole signs were observed along both sides of ditch. A total of three burrows, all considered to be recently utilised. Three mammal runs were located along the sides of the ditch, and six piles of feeding remains were observed.
Green 37	Ditch separating arable fields containing water at the southern end, dry at the northern end. A continuous stand of common reed present at the northern end, towards the southern end of the ditch scattered scrub is present.	Water vole signs were observed along both sides of ditch. A total of three burrows, all considered to be recently utilised. Two mammal runs were located along the sides of the ditch, and two piles of feeding remains were observed.
Green 38	Ditch separating arable fields containing water, and a continuous stand of common reed.	Water vole signs were observed along both sides of ditch. A total of one burrow, considered to be recently utilised, and three piles of feeding remains were observed.
Green 38a	Ditch separating arable fields containing water, and a continuous stand of common reed.	Water vole signs were observed along both sides of ditch. A total of two burrows, all considered to be recently utilised. Two mammal runs were located along the sides of the ditch, and four piles of feeding remains were observed.
Green 41	Ditch separating arable fields containing water, and a continuous stand of common reed.	Water vole signs were observed along both sides of ditch. A total of four burrows, most considered to be recently utilised. Four mammal runs were located along the sides of the ditch, one latrine, and two piles of feeding remains were observed.
Green 42	Short ditch separating arable fields, contains water, and a continuous stand of common reed.	Only feeding remains were identified at two locations along the ditch.
Green 43	Ditch separating arable fields containing water, and a continuous stand of common reed.	Only the southern section of Green 43 was surveyed. Feeding remains were identified at two locations, and a burrow was observed along the east bank of the water body.

** Please refer to Figure 6 for the locations of the water bodies.*

Area 5

3.2.14 A total of 31 water bodies comprising a mixture of drainage ditches, ponds, and marshy areas were identified, of these, eight water bodies contained evidence of water voles; Orange 20, 57, 82a, 111, and 121, and Blue 22, 59, and 58 (Figure 5).

3.2.15 The remaining 23 water bodies did not contain evidence of water voles, they are however, considered suitable to support them.

Mink

3.2.16 Mink (*Mustela vison*) signs were recorded within Area 4, north of the A1014 (The Manorway) and within Area 5 (Figure 5).

3.3 Summary

3.3.1 Of the 104 water bodies present within the survey area, 42 contained signs of water vole usage, and are considered to support water voles. 38 are considered suitable to support water voles; however they contained no signs of water vole usage. Eight are not considered suitable to support water voles in 2010. The remaining 16 were not surveyed, 13 of which occurred in Area 2 but these are unlikely to be impacted upon and were therefore omitted from the survey, the remaining three water bodies located within the Northern Triangle Receptor Site, within Area 4, have not been surveyed due to access restrictions. These three water bodies are assumed to support water voles as they are being used as a receptor site.

SECTION 4

DISCUSSION & RECOMMENDATIONS

4 DISCUSSION & RECOMMENDATIONS

4.1 Overview

4.1.1 A total of 104 water bodies were identified within the survey area. Water voles were found to be present in 42 of the water bodies / groups of water bodies. In each of these water bodies, evidence of water vole utilisation such as burrows, nests, latrines, sightings, and feeding remains, was recorded.

4.1.2 Water voles are known to be present within Areas 2 - 5 (Figure 6), but were not recorded in Area 1. It is possible to estimate the population of water voles within a survey area by the frequency of latrines observed within a given area. However, due to limited access during the 2010 survey, and the lack of data obtained from Thomson Ecology, the results were not conducive to population estimations. Drawing on professional experience and previous reports it is likely that the survey area supports a medium-large meta-population of water voles within a large area of suitable habitat. The areas are highly connected by a network of drainage ditches and hedgerows and this is likely to facilitate water vole migration throughout the area.

4.1.3 The data obtained for this report has been acquired from surveys undertaken over several years. During these years extensive water vole translocations have commenced as part of the 'London Gateway Ecological Mitigation and Management Plan – Water Vole 2008' (Thomson Ecology, 2008). Under this plan water voles are to be translocated into the Northern Triangle (west), West Canvey Marshes (Figure 2) and areas of the River Colne (Thomson 2009) from the LG Development site and Site A (an area of land that is being enhanced and managed for breeding birds, see Figure 2). However, this is not considered to significantly affect the assessment and recommendations given within this report as the locations of the receptor sites are known; the numbers of water voles are not likely to change beyond any natural annual fluctuations; and the recommendations provided below have are based on a precautionary approach.

4.1.4 There is currently no water vole fencing surrounding the Northern Receptor Site (east and west), it is therefore likely that individuals released into the receptor site will migrate into surrounding suitable, connected habitat. A precautionary approach has therefore been adopted, taking into account the possible increase in water vole population within water bodies north of the A1014 (The Manorway).

4.1.5 Construction of the gas pipeline and potentially the electric cabling will require a 30 m wide working corridor and is anticipated to take approximately six months to complete. It is understood that areas of the indicative route would be fenced, the topsoil stripped, and the trench excavated for the entire length of the pipeline prior to construction commencing. This would result in temporary and localised fragmentation, disturbance and habitat loss where water bodies are crossed. The main works are only likely to be operational at any one point along the route for a maximum of two weeks at a time as the pipe or cable is laid iteratively. Increased noise, light and vibration disturbance and an increase in dust deposition are therefore likely to be highly localised and very temporary in nature.

4.1.6 Due to the large number of suitable water bodies located within and surrounding the survey area it is possible that water voles could use lengths of water bodies within the surrounding area during construction. The unavoidable temporary habitat loss and fragmentation is therefore unlikely to cause any significant or long-term impacts on local populations.

4.1.7 The indicative route of the linear gas pipeline and electric cabling is envisaged to directly bisect approximately 17 water bodies. This includes 14 water bodies within Areas 3 and 4, which are known to support water voles. One of these water bodies (Blue 23) is located in Area 3 and, the remaining 13 are located north of the A1014

(The Manorway) in Area 4. Potentially, a further two water bodies (Green 20 and Blue 60) which are considered suitable to support water voles but where no evidence was found will be affected if substation option 5b is chosen. Finally one water body not considered suitable for water voles during the 2010 surveys (Green 18) will also be directly affected.

4.1.8 The water bodies present within Area 5 are to be drained and levelled following development within the LG Development, these water bodies are therefore unlikely to occur at the time of construction.

4.2 Impact Assessment of Survey Areas 1 - 5

4.2.1 Although the final design has yet to be confirmed, it is likely that approximately 17 water bodies will be directly affected by the indicative route. The intentionally or recklessly damage, or obstruction of any place that water voles use for shelter or protection is likely to result in the breach of the Wildlife and Countryside Act, 1981 (as amended).

4.2.2 Under current plans, the pipeline starts within Area 1 and tunnels (via HDD) under much of Area 2; only bisecting water bodies within Areas 3-5

4.2.3 Although there are there are three main methods to lay pipelines across water bodies: open cut, HDD, and bridging, the current plans do not state how water bodies will be bisected. For the purposes of this report the method most ecologically detrimental is considered to be the approach adopted.

4.2.4 It is understood that three tunnels will be constructed, for HDD under the fishing lakes and the nature reserve located to the east of the survey area, and at two locations under the A1014 (The Manorway) along the indicative route. It is understood that the access and egress points of the HDD sites, the footprint of each bore hole and associated traffic access could be larger than the 30m width required for the trench excavation; potentially resulting in a larger area of temporary land take. However, the HDD access and egress points are not likely to bisect any water bodies, and are unlikely to occur within 10 m of any water body. As a result, it is considered that direct and indirect impacts are unlikely.

4.2.5 The development of the AGI / substation within the survey area will result in permanent land take. However, the preferred locations are all located within arable fields and are likely to be situated more than 10 m distant from water bodies. At present, these areas are therefore not considered suitable for water voles and no impacts upon water voles are identified. However, substation option 5b may result in the temporary disturbance of two water bodies with potential to support water voles. It is understood that following the confirmation of the substation location, a further detailed assessment of the three locations will be undertaken by National Grid.

Area 1

4.2.6 Two of the eight water bodies located within Area 1 were not considered to be suitable to support water voles, the remaining six were considered suitable to support water voles, however no evidence was recorded during the 2010 surveys and the pipeline is not currently planned to occur within 10 m of any water body, therefore no impacts are identified.

Area 2

4.2.7 The majority of the route within Area 2 will be tunnelled using HDD technology. The only envisaged impact would therefore be at and around the access and egress points of the bore hole. These have yet to be identified but it is understood that they will be located within arable fields more than 10 m distant from water bodies. No impacts on water voles within the area are therefore envisaged.

Area 3

4.2.8 Area 3 contains 11 water bodies that are known to support water voles and a further five which are considered suitable but no evidence was recorded. The indicative route is envisaged to directly bisect two water bodies (Green 23 and Green 18). Green 18 is not suitable for reptiles (within the 2010 surveys) however , Green 23 is known to support water voles (Figure 6). Green 23 is a small drainage ditch ending at the northern section in a concrete culvert, with the southern section connecting to a large network of ditches .

4.2.9 The majority of land bisected by the indicative route within Area 3 is comprised of large, well managed arable fields separated by a network of connected drainage ditches and hedgerows that provide suitable commuting habitat. Temporary habitat loss (approximately 30m of suitable aquatic habitat) will result throughout.

Area 4

4.2.10 Area 4 contains 23 water bodies that contain evidence of water vole usage and a further four which are considered suitable for water voles but did not have any evidence of use. The majority of land bisected by the indicative route within Area 4 comprises large, well managed arable fields separated by a network of connected drainage ditches and hedgerows.

4.2.11 Under the current plans the indicative route is likely to directly bisect up to 14 water bodies, that are known to support water voles. The exact number of water bodies to be affected can only be confirmed following the final design of the route. The water bodies that are likely to be bisected by the route are generally 1.5 – 3 m wide with emergent vegetation occurring throughout. Temporary habitat loss (approximately 15-30m of suitable aquatic habitat) will result where the indicative route crosses a water body. Furthermore it is likely that indirect disturbance from an increase in noise, dust, and vibration associated with the pipeline works will also occur within the immediate vicinity.

4.2.12 The indicative route currently runs directly through the Northern Triangle (west) Receptor Site for the LG Development. The habitat creation and enhancement plans for the Northern Triangle (west) include the creation of 2,500 m of suitable water vole habitat, to allow for the translocation of 50 - 60 water voles within the area. It is therefore assumed that water voles occur within all water bodies located within the receptor site. This site is managed under a Natural England European Protected Species Licence (for great crested newts) and is thus subject to stringent legal requirements and conditions. Assuming the route alignment is not amended; any works within the Northern Triangle will require detailed consideration and negotiation with Natural England to ensure that the site's conservation value is maintained and the works are legally compliant.

Area 5

4.2.13 Area 5, located within the LG Development, contained eight water bodies which in 2008 were found to support water voles. The area also supports a further 23 water bodies that are considered suitable for this species but within which no evidence was recorded. However, water vole translocation from the LG Development into the surrounding receptor sites, the filling-in of the ponds and the levelling of the area under the relevant permissions has begun. It is expected that no water voles or habitat suitable to support water voles will be present within Areas 5 or the LG Development by the time construction of the proposed development commences. The proposed development is therefore unlikely to impact upon water voles in this location.

4.2.14 In summary, the construction of the proposed development would lead to short-term, temporary habitat loss; fragmentation; and indirect disturbance impacts on the local

population of water voles. Furthermore the actual construction of the proposed development is likely to increase the risk of water voles being injured or killed during the construction phase. It is envisaged that depending on the final route, up to 17 water bodies known to support water voles may be directly affected. The water bodies that are likely to be impacted upon occur within Areas 3 and 4.

4.3 General Recommendations

4.3.1 The surveys have confirmed the presence of water vole within Areas 2, 3, 4 and 5 but the indicative route is likely to only affect water bodies within Areas 3 and 4. The quantity of suitable connective terrestrial and aquatic habitats indicate that a precautionary approach should be adopted that assumes a medium-large water vole meta-population occurring within and immediately surrounding the survey area. The recommendations presented within this report have therefore been designed to account for the expected movement of water voles into the area, originating from the translocation works associated with the LG Development site into the Northern Triangle Receptor Site.

4.3.2 It is recommended that where possible water bodies should be avoided and that a 10m buffer zone is put into place in order to minimise direct and indirect impacts on water voles. It is considered that a 10 m buffer zone and other construction best practice methods (including but not limited to adherence to pollution prevention guidance and directional lighting) will provide ample protection from disturbance. If the indicative route and associated construction footprint requires alteration, advice should be sought from an ecologist regarding the potential requirement for additional mitigation.

4.3.3 It is recommended that if possible, where the indicative route bisects water bodies the working width should be decreased to approximately 10 - 15m to reduce the impact of habitat loss and disturbance.

4.3.4 Where temporary impacts have been identified, it is considered likely that the most appropriate mitigation technique to avoid killing or injury will be displacement of water voles from lengths of suitable habitat through habitat manipulation. The applicability of this will require detailed consideration once a preferred routings / locations have been decided upon. A Natural England licence will be necessary if trapping and translocation of individuals is required.

4.3.5 The displacement of water voles through habitat manipulation should occur at the beginning of the breeding season (from mid February, but before April as per standard guidelines). Habitat displacement relies on the area being maintained as unsuitable for water voles throughout the construction period but is also subject to the mitigation requirements of other protected species.

4.3.6 All habitats temporarily lost to the pipeline and cabling routes would be fully reinstated following the completion of the works. Due to the temporary nature of the works and the lack of any long term or permanent impacts, it is unlikely that any further compensation, such as habitat creation would be required, especially given the large and widespread habitat creation that has been implemented under the LG Development.

4.3.7 The survey area was designed around the alignment of an existing gas pipeline because at the time of writing, the final linear route alignment had not been agreed. The recommendations made within this report are therefore intrinsically linked to the indicative route. Should the final route differ significantly from the indicative alignment it could affect water bodies outside of the survey area that were not considered within this report, and further detailed surveys might be required.

4.3.8 All water bodies known to support water voles and which will be affected by the indicate route will be subject to the mitigation requirements outlined above. On a

precautionary basis the two water bodies which are suitable to support water voles and which may be affected by the construction of the substation 5b should also be subject to the same mitigation. Any water bodies which were considered not suitable for water voles in 2010, should be subject to an update survey prior to the commencement of the construction works to ensure the conditions have not changed. If they are later found to be suitable for water bodies they too should be subject to the suggested mitigation.

SECTION 5

CONCLUSIONS

5 CONCLUSIONS

5.1.1 Water vole surveys were undertaken in 2008 by Thomson Ecology and in June 2010 by PB. The surveys indicated the presence of water voles throughout the survey area. The proposed development works are likely to directly impact up to 17 water bodies located within a large network of drainage ditches, which contain field signs of water voles. Mitigation measures have been recommended to minimise the risks of the works resulting in any offences being committed under the Wildlife & Countryside Act 1981 (as amended).

5.1.2 It is recommended, that habitat manipulation to temporarily exclude water voles from the works area is undertaken prior to construction. Where possible, no works should be undertaken within 10 m of a water body that is known to support or has potential to support water voles. It is considered that this, along with standard construction best practice methods (as described in section 4.3), will provide sufficient protection from disturbance. All mitigation measures will require careful consideration once detailed designs have been completed. The latest guidelines and advice from a qualified ecologist should be sought when finalising the proposed development design.

5.1.3 Due to the temporary nature of the proposed development and the footprint area, it is considered that the long-term ability of this area to be utilised by water voles will not be affected by the proposed works. Mitigation measures set out within this report are designed so that temporary disturbance, habitat loss and fragmentation impact associated with the indicative route are likely have a minimal impact upon water vole within the area. No habitat creation or trapping is likely to be required and has therefore not been recommended at this stage. If the indicative route and associated construction footprint requires alteration however, advice should be sought from an ecologist regarding the potential requirement for further surveys and recommendations.

SECTION 6

REFERENCES

6 REFERENCES

Parsons Brinckerhoff (2010), Gateway Energy Centre Ecology Scoping Report

Parsons Brinckerhoff (2010), Phase II Great Crested Newt Report for the Gateway Energy Centre

Parsons Brinckerhoff (2010), Phase II Reptile Report for the Gateway Energy Centre

Strachan and Moorhouse (2006), Water Vole Conservation Handbook Second Edition, *Wildlife Conservation Research Unit, Oxon*

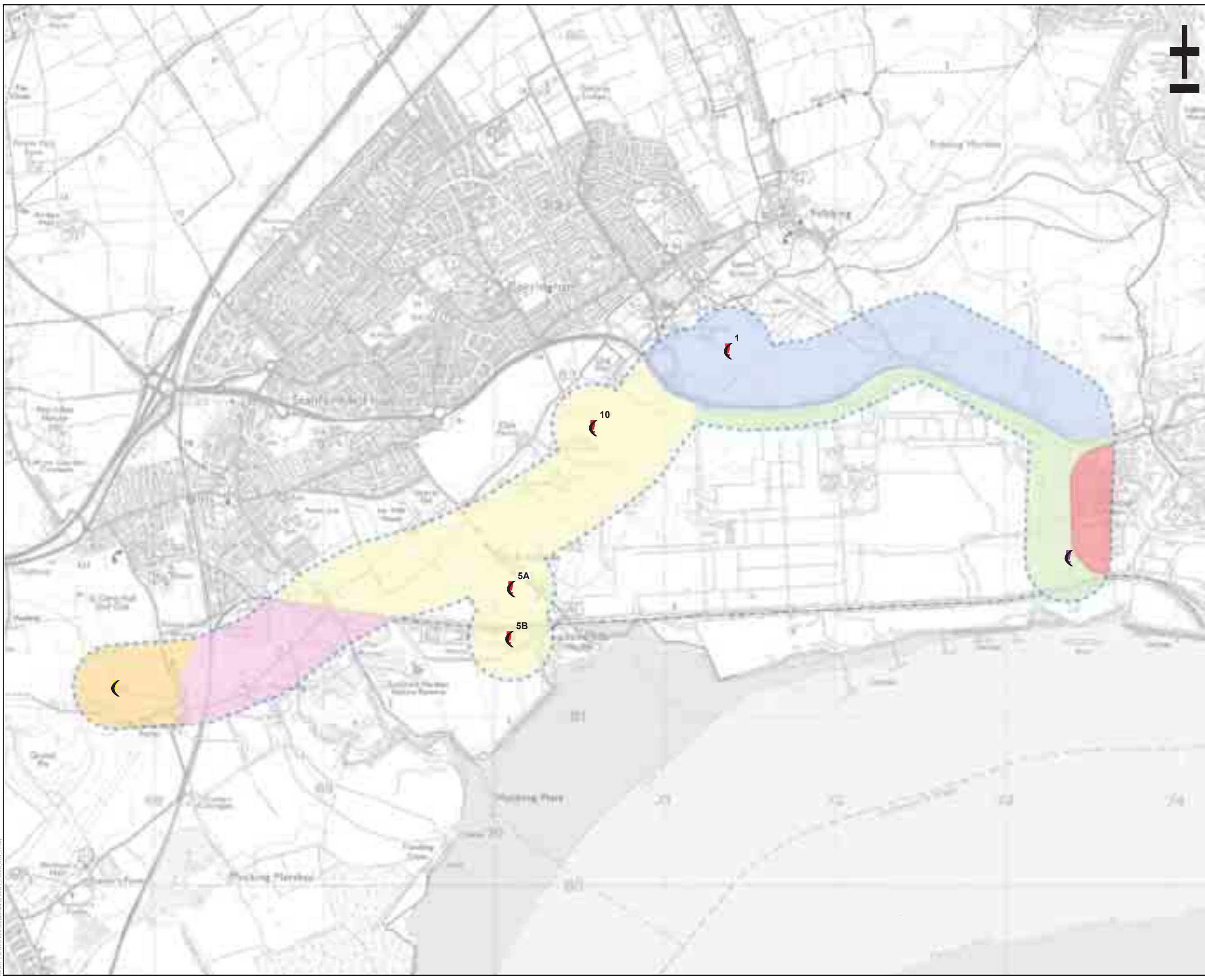
Thomson Ecology (2008), London Gateway Ecological Action Plan – Water Vole

Thomson Ecology (2009), London Gateway Development – River Colne Catchment Water Vole Survey – May 2009

Thomson Ecology (2008), Site A – Summary of Ecological Works

FIGURES

FIGURE 1: LOCATION OF THE SURVEY AREA &CCGT SITE, GAS INLET & FOUR POSSIBLE SUBSTATIONS



THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED

Notes

- Total Survey Area
- Area 1
- Area 2
- Area 3
- Area 4
- Area 5
- Area Not Accessed
- CCGT Power Station
- Start of Gas Pipeline
- Potential Sub Station Location

0 100 200 300 400 500
Metres

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Gateway Energy Centre

Drawing Title: Water Vole Survey Areas

Scale at A3: 1:20,000

Drawn	JL	Approved	TM
Stage 1 check	Stage 2 check	Originated	Date 14/06/2010

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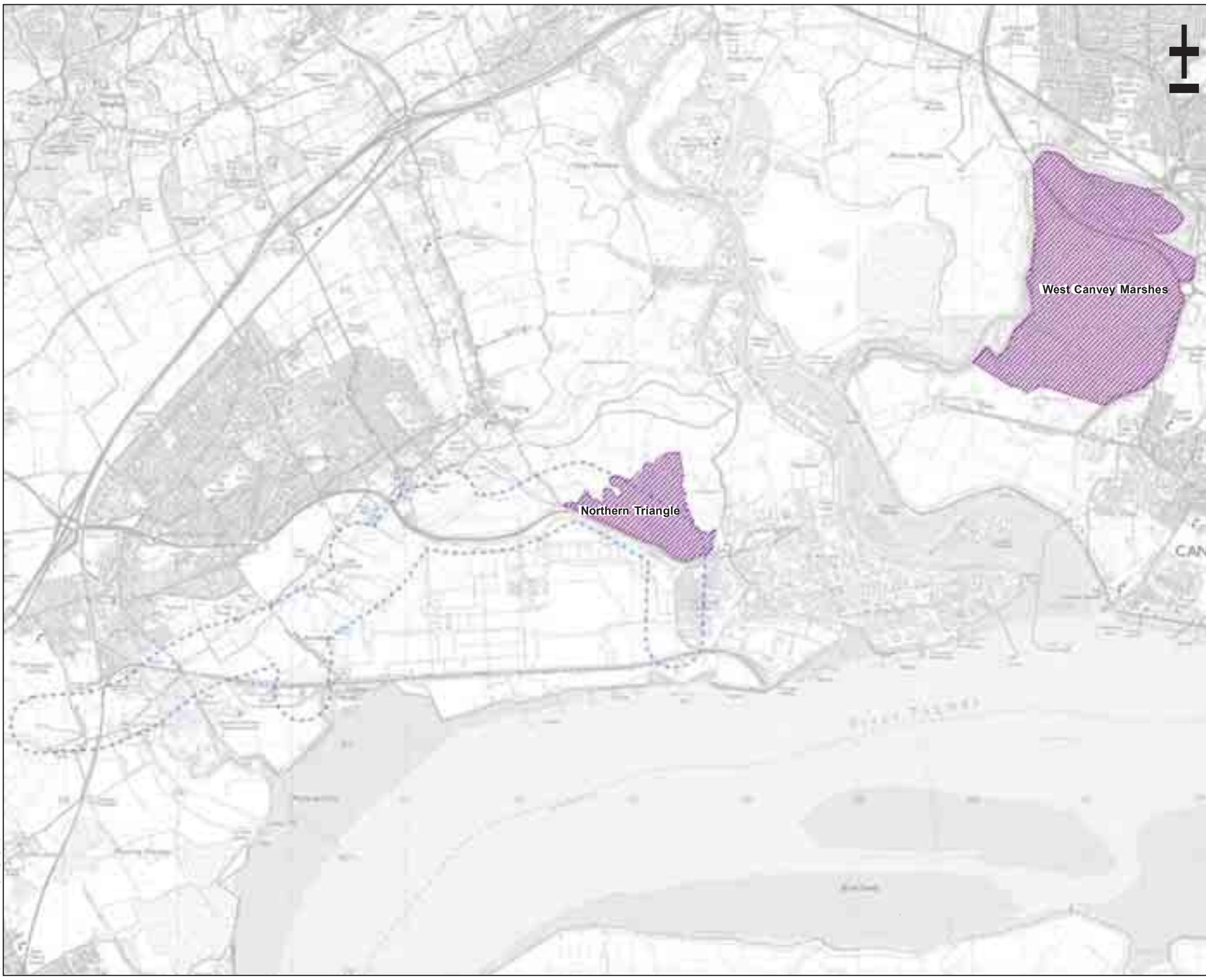
Drawing Number: **63958A_WV_SA** Rev

FIGURE 2: LOCATION OF LG DEVELOPMENT WATER VOLE RECEPTOR & DONOR SITES



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Notes

Total Survey Area

Water Vole Receptor Site

0 200 400 600 800 1,000
Metres

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Gateway Energy Centre

Drawing Title: Water Vole Receptor Sites for The DP World Development

Scale at A3: 1:30,000

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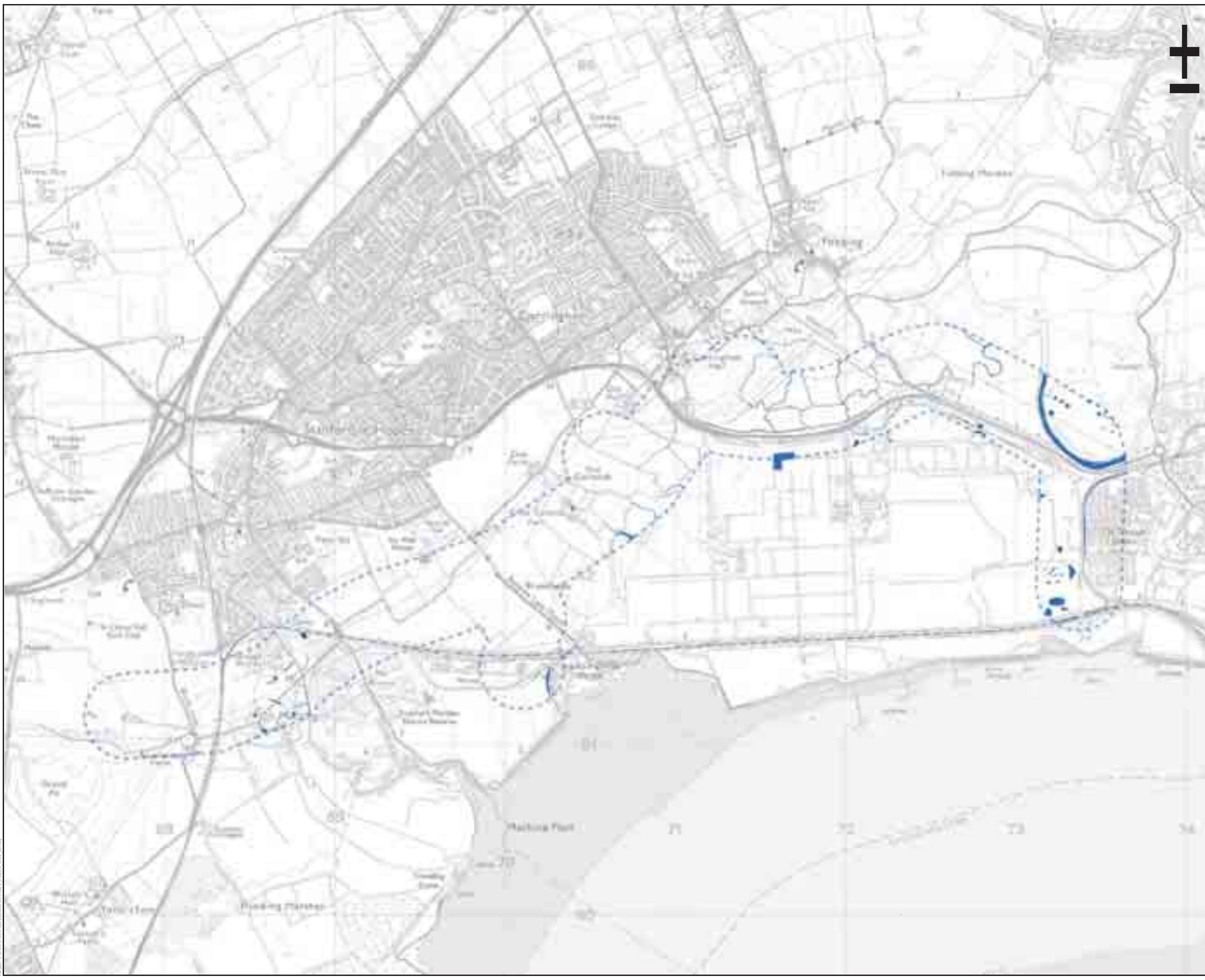
FIGURE 3: LOCATION OF WATER BODIES WITHIN THE SURVEY AREA



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Notes

Total Survey Area

Waterbody

0 100 200 300 400 500
Metres

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Gateway Energy Centre

Drawing Title: Location of Waterbodies Within and Around the Survey Area

Scale at A3: 1:20,000

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FIGURE 4: 2010 SURVEY – WATER VOLE ACTIVITY SIGNS

Activity Map Location

Scale 1:50,000

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Notes

Total Survey Area

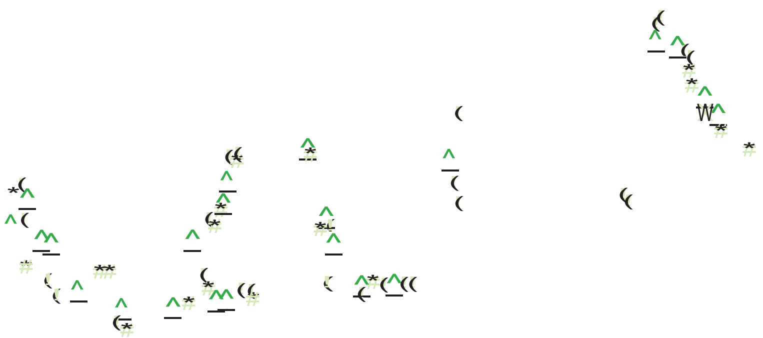
Waterbody

Water Vole Burrows

Water Vole Feeding Remains

Water Vole Latrine

Water Vole Pathway



0 50 100 150 200

Metres

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Revision Details | By | Date | Suffix | Check

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Job Title: Thames Haven Gateway Energy Centre

Drawing Title: Water Vole Activity

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Stage 1 check | Stage 2 check | Originated | Date 15/09/2010

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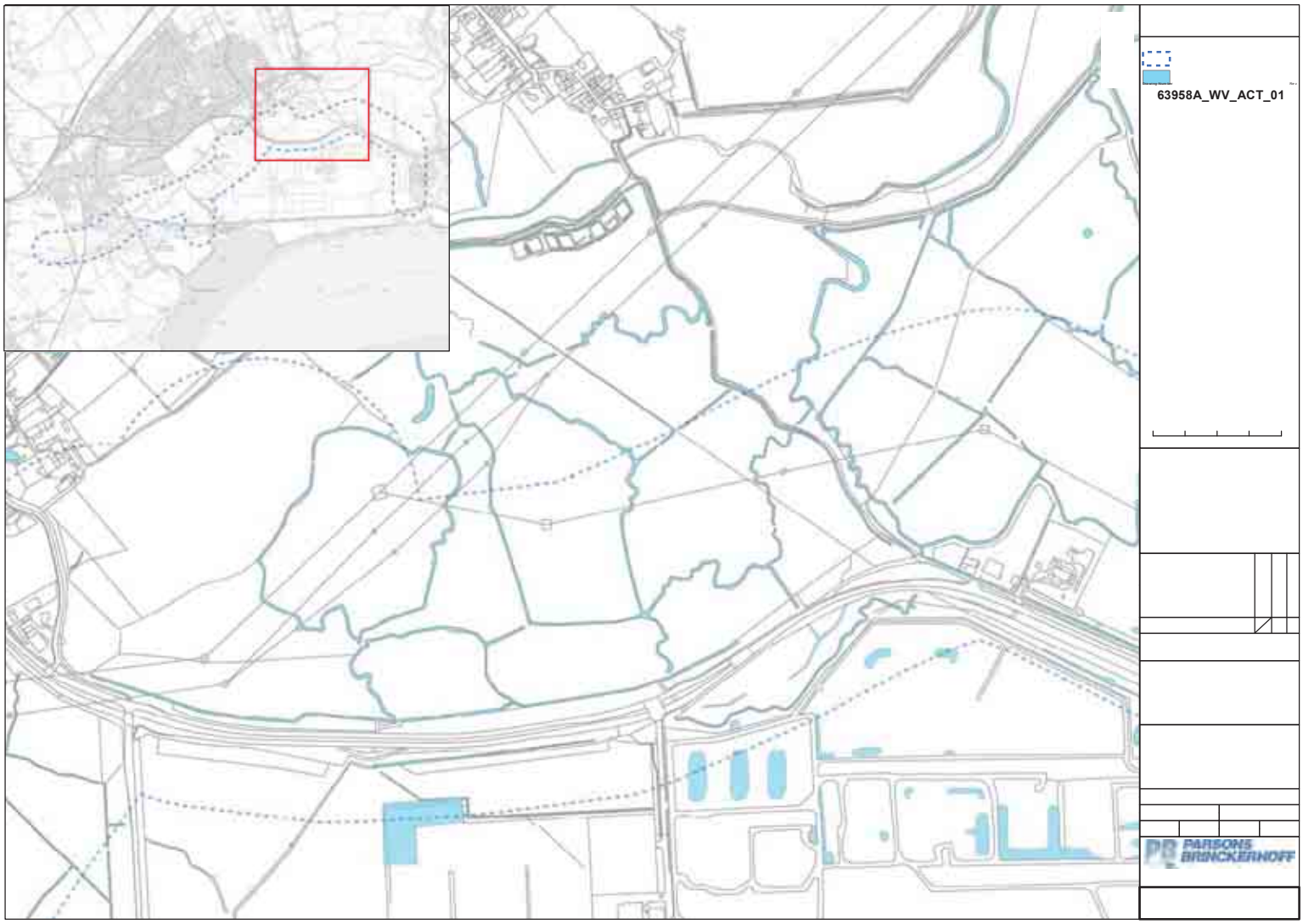
63958A_WV_ACT_01
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FIGURE 5: 2008 SURVEY – WATER VOLE ACTIVITY SIGNS

FIGURE 6: CATEGORISATION OF WATER BODIES SUITABILITY TO SUPPORT WATER VOLES

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Notes

Map Sheet

0 100 200 300 400 500
Metres

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Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Gateway Energy Centre

Drawing Title: Alignment of Map Sheets For Water Vole Report

Scale at A3: 1:20,000

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			16/06/2010

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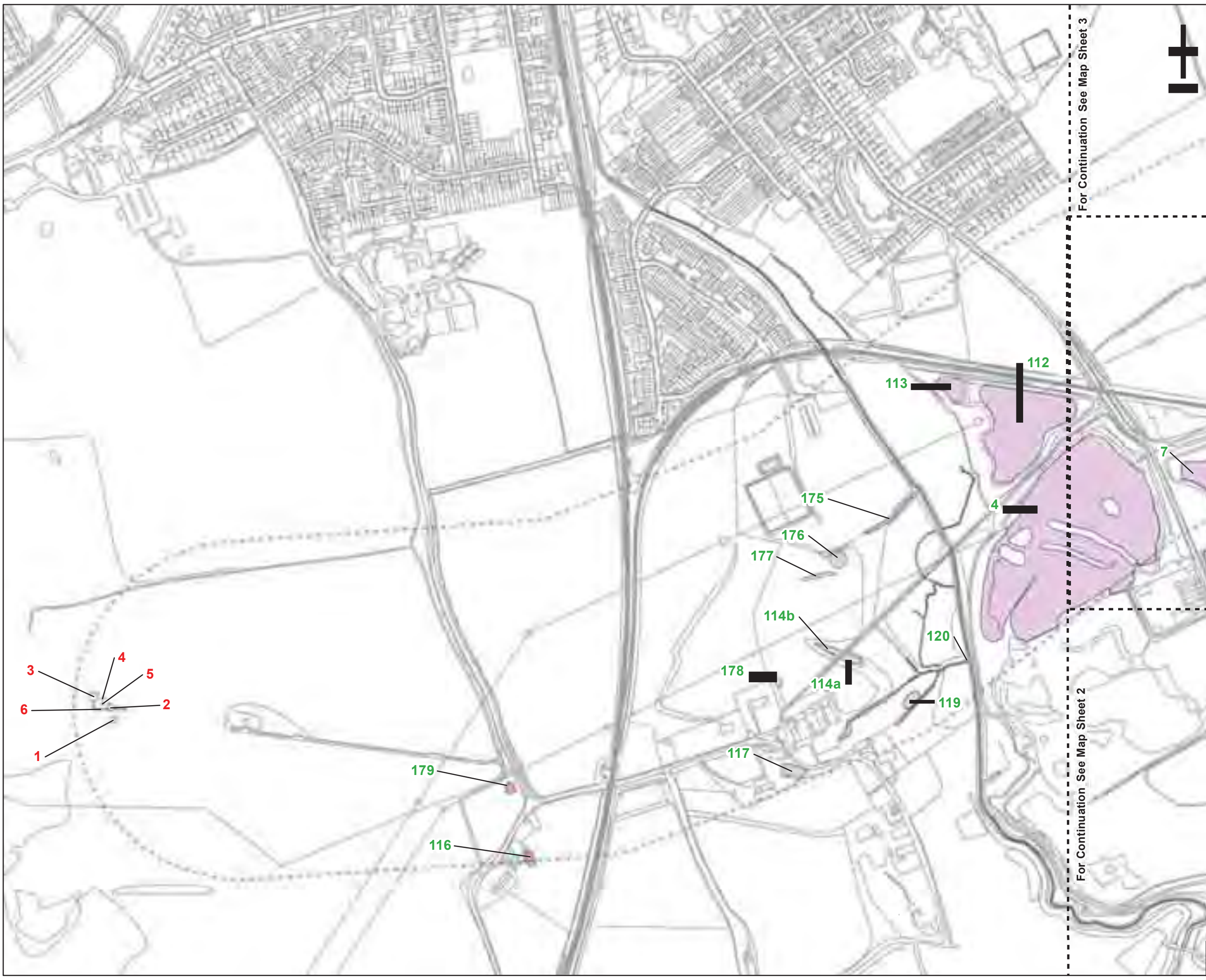

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Notes

- Map Sheet
- Total Survey Area
- No Signs of Water Vole Present
- Waterbody with Signs of Water Vole Activity (2008)
- Waterbody with Signs of Water Vole Activity (2010)
- Waterbody Not Surveyed in 2008/2010, But Water Voles Considered Present
- Waterbodies Occuring Outside of the Survey Area
- Waterbody Not Suitable / Dry

In the 2001 and 2002 surveys waterbodies were numbered 1-127. The waterbodies were re-numbered in 2006 1-125 without reference to the previous numbering system, with some waterbodies being grouped together. This resulted in the duplication of waterbody numbers, with some waterbodies having two numbers and others having one, but sharing this with other waterbodies.

To clarify the numbering system, the numbers and colours have been left the same as in the Thomson report whereby waterbodies surveyed and identified within different years have colours as well as numbers thereby reducing the confusion of replicated numbers. To clarify all waterbodies surveyed in 2008/9 are coloured in orange, blue, and green to allow for cross-referencing with the Thomson Ecology Report. New 2010 waterbodies are represented in red.

0 50 100 150 200
Metres

Revision Details	By	Date	Suffix

Drawing Status: FINAL

Job Title: Gateway Energy Centre

Drawing Title: Waterbodies Considered To Support Water Voles (Map Sheet 1 of 7)

Scale at A3	1:5,000		
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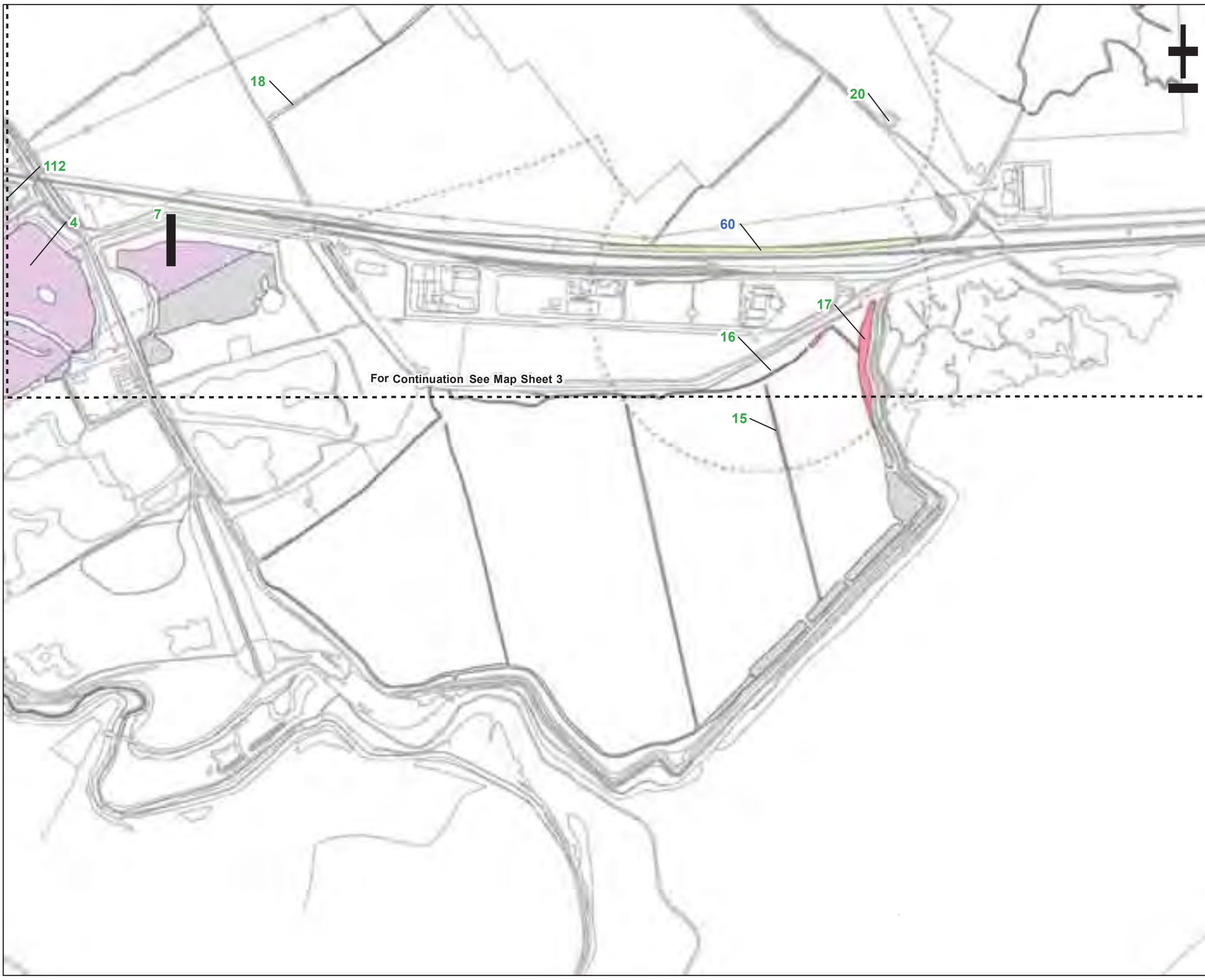

Notes

- Map Sheet
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- No Signs of Water Vole Present
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0 50 100 150 200
Metres

Revision Details	By / Check	Date	Suffix

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Job Title: Gateway Energy Centre

Drawing Title: Waterbodies Considered To Support Water Voles (Map Sheet 2 of 7)

Scale at A3: 1:5,000

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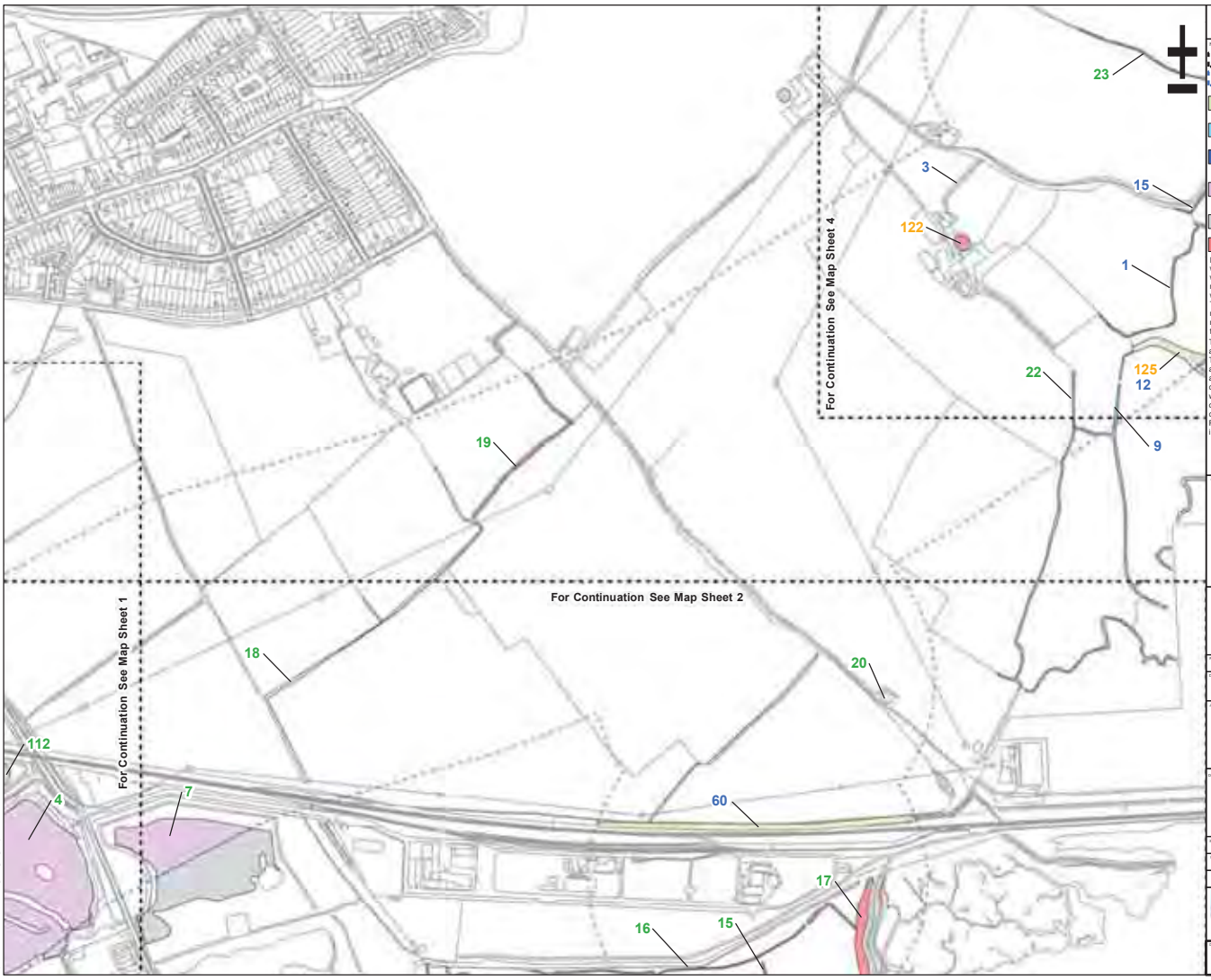

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Notes

- Map Sheet
- Total Survey Area
- No Signs of Water Vole Present
- Waterbody with Signs of Water Vole Activity (2008)
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0 50 100 150 200
Metres

Revision Details | By | Check | Date | Rev No

Drawing Status: FINAL

Job Title: Gateway Energy Centre

Drawing Title: Waterbodies Considered To Support Water Voles (Map Sheet 3 of 7)

Scale at A3: 1:5,000

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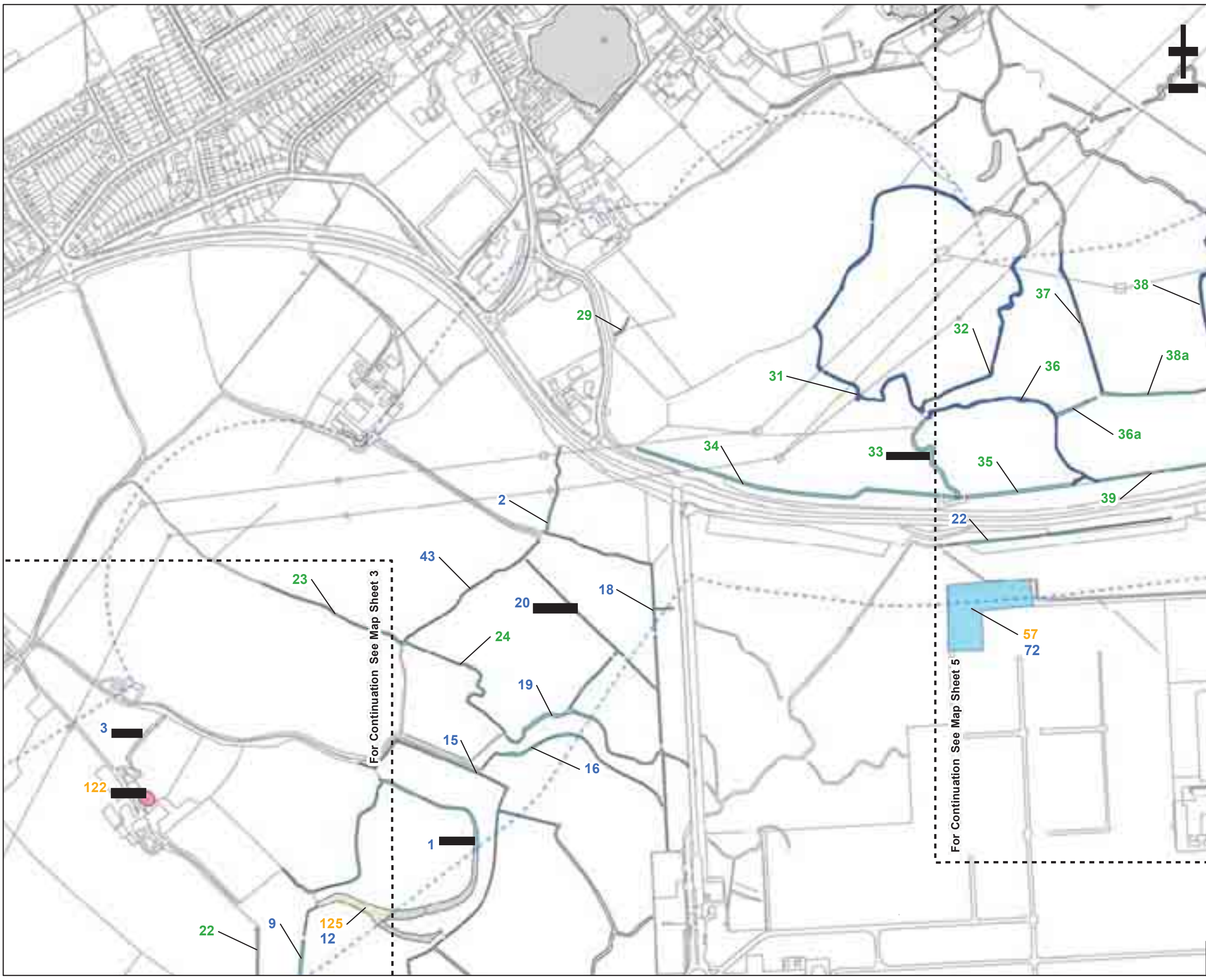

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Notes

- Map Sheet
- Total Survey Area
- No Signs of Water Vole Present
- Waterbody with Signs of Water Vole Activity (2008)
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0 50 100 150 200
Metres

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Gateway Energy Centre

Drawing Title: Waterbodies Considered To Support Water Voles (Map Sheet 4 of 7)

Scale at A3: 1:5,000

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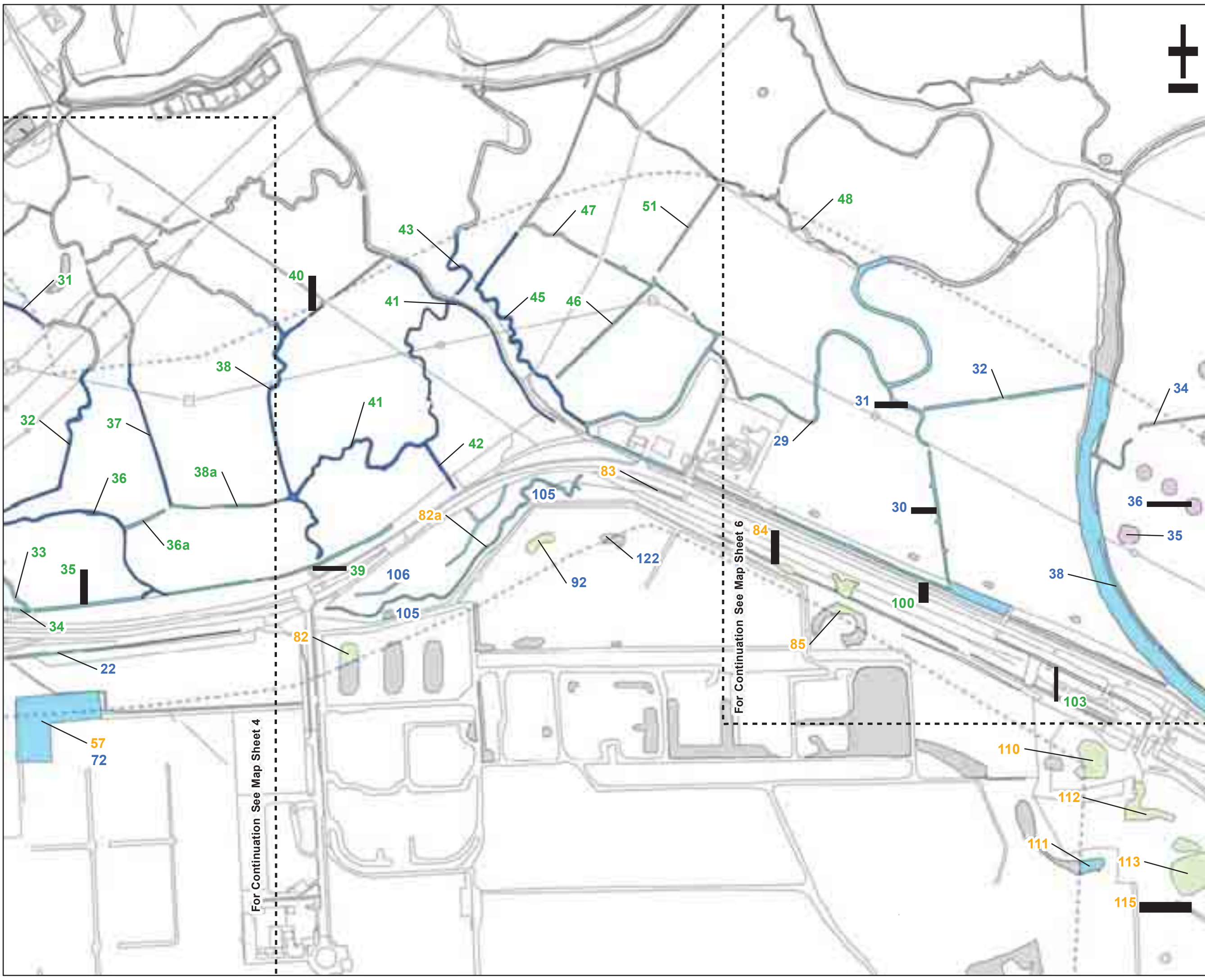

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Notes

- Map Sheet
- Total Survey Area
- No Signs of Water Vole Present
- Waterbody with Signs of Water Vole Activity (2008)
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0 50 100 150 200
Metres

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Gateway Energy Centre

Drawing Title: Waterbodies Considered To Support Water Voles (Map Sheet 5 of 7)

Scale at A3: 1:5,000

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Stage 1 check	Stage 2 check	Originated	Date 15/09/2010

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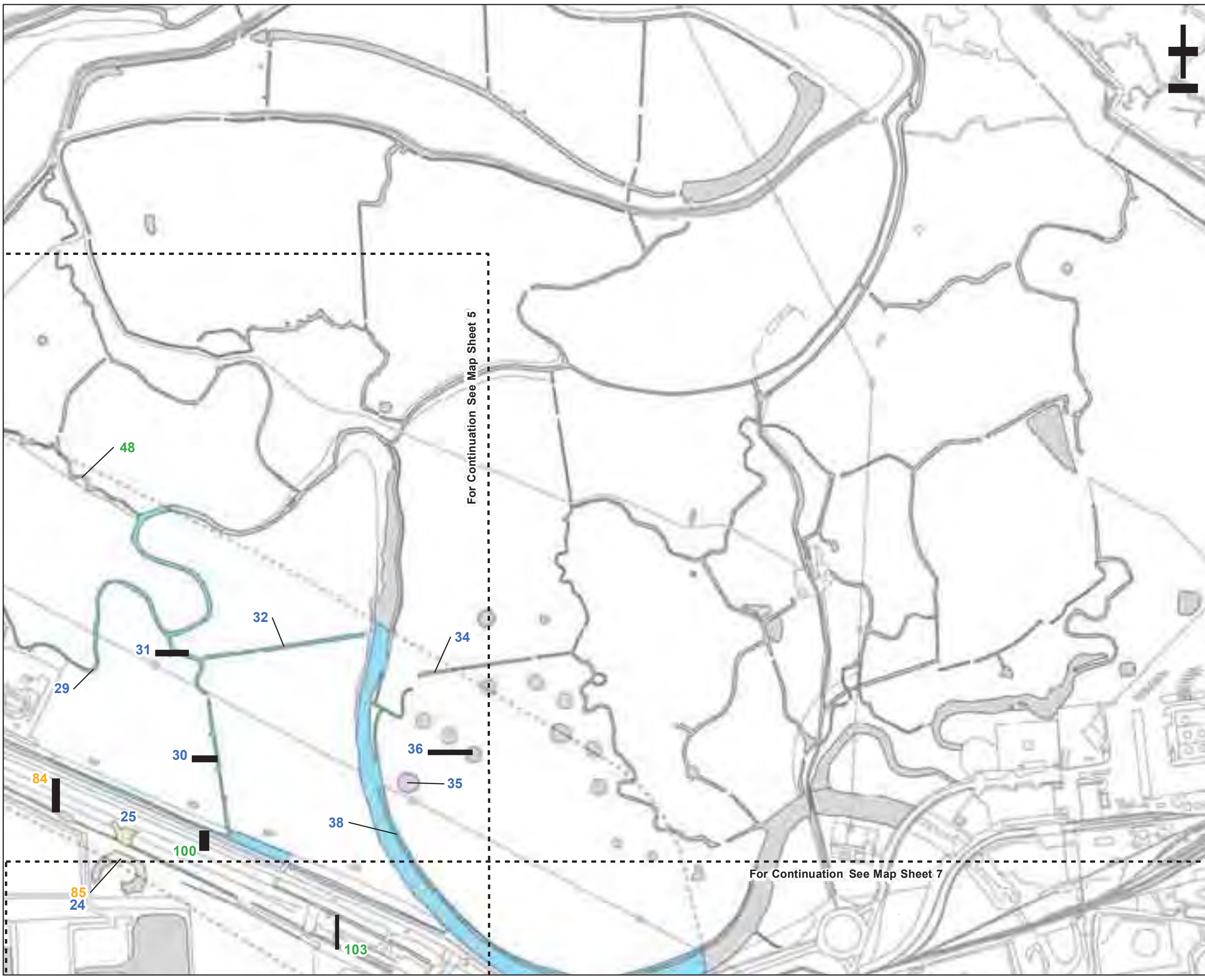

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Notes

- Map Sheet
- Total Survey Area
- No Signs of Water Vole Present
- Waterbody with Signs of Water Vole Activity (2008)
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0 50 100 150 200
Metres

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Gateway Energy Centre

Drawing Title: Waterbodies Considered To Support Water Voles (Map Sheet 6 of 7)

Scale at A3: 1:5,000

Drawn	JL	Approved	TM
Stage 1 check	Stage 2 check	Originated	Date 15/09/2010

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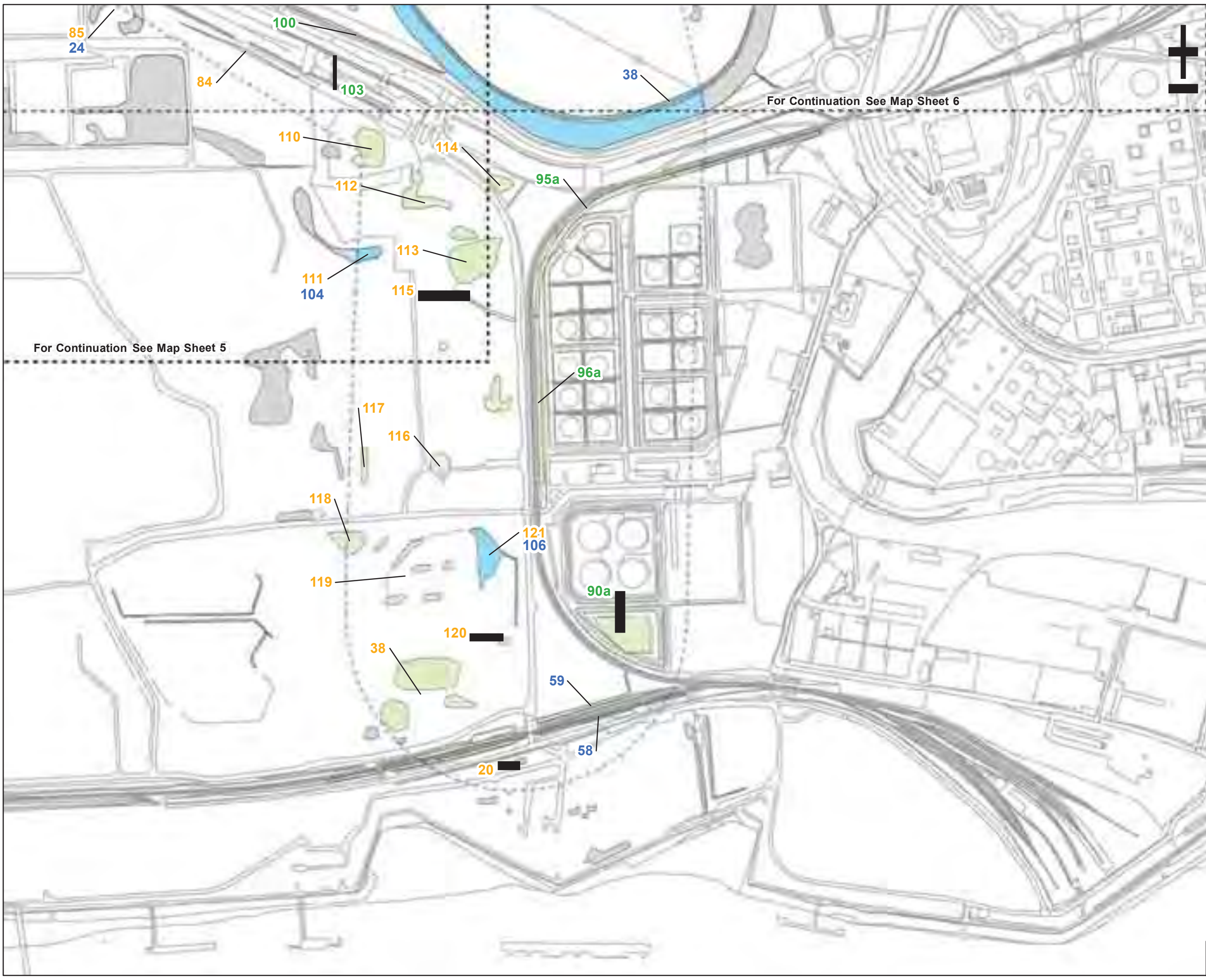

Notes

- Total Survey Area
- Map Sheet
- No Signs of Water Vole Present
- Waterbody with Signs of Water Vole Activity (2008)
- Waterbody with Signs of Water Vole Activity (2010)
- Waterbody Not Surveyed in 2008/2010, But Water Voles Considered Present
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0 50 100 150 200
Metres

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Gateway Energy Centre

Drawing Title: Waterbodies Considered To Support Water Voles (Map Sheet 7 of 7)

Scale at A3: 1:5,000

Drawn	JL	Approved	TM
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Drawing Number: 63958A_WV_WB_07 Rev

F.6 Phase II Great Crested Newt Survey Report

Phase II Great Crested Newt Report: Gateway Energy Centre Gas and Grid Connection Routes

InterGen

October 2010

PARSONS BRINCKERHOFF

PB 125 YEARS

Report Title	**:**	**Phase II Great Crested Newt Report: Gas and Grid Connection Routes**
Job No	**:**	**63958A**
Date	**:**	**October 2010**
		
Prepared by	**:**	**Marianne Curtis**
		
Checked by	**:**	**Ursula Digby**
Approved by	**:**	**Richard Wearmouth**

Document History and Status

Report Issue	Date of Issue	Prepared By:	Checked By:	Approved By:

CONTENTS

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Parsons Brinckerhoff Ltd (PB) was commissioned by InterGen to undertake a detailed Great Crested Newt (GCN) (*Triturus cristatus*) population and distribution survey south and east of Stanford-le-Hope, Essex, to inform the construction of the proposed gas pipeline and associated AGI / electrical connection and sub-station associated with the Gateway Energy Centre Combined Cycle Gas Turbine (CCGT) Power Station (GEC).

The exact alignment / routes and locations of the proposed gas pipeline and associated AGI / electrical connection and sub-station have yet to be finalised. However, the indicative alignment / routes and locations have been established and form the basis of this assessment. The survey area encompasses a 250 m buffer either side of an indicative approximate 7.7 km long gas pipeline and 6 km long electrical connection. The survey area is situated between TQ 677 810 and TQ 732 817. The habitat is dominated by arable, grazing marsh and brownfield sites, separated by a large branching network of hedgerows with waterbodies present throughout. Water bodies that are suitable to support GCN are located throughout the survey area.

The objective of the assessment was to document GCN distribution and populations and to establish the level of activity of GCN located within the survey area, to determine whether the proposed development is going to cause negative impacts on local GCN populations and to provide / suggest suitable mitigation.

Ecology Services Limited completed GCN population surveys to inform the associated LG Development in 2001, 2002 and 2006, with more recent surveys being completed by Thomson Ecology in 2008 and 2009. A large number of these previously surveyed water bodies are located within the survey area of this assessment and have therefore been considered relevant to this assessment. PB undertook GCN population surveys on all water bodies within the survey area but not those surveyed by Thomson in the last two years. The Thomson and PB data combined covers all water bodies located within the 500 m wide survey area.

In total 118 water bodies were identified within the survey area, all were subject to a Habitat Suitability Index assessment (HSI) to determine their potential for supporting GCN. It was concluded that 75 of these water bodies were suitable to support GCN and these were subject to detailed survey.

GCN were confirmed present in 28 of the 75 water bodies considered suitable to support GCN. These water bodies are located across the survey area indicating the GCN are present throughout. Of the 28 water bodies, five were found to support populations of a 'medium' size class, and 23 supported 'small' populations. These small and medium populations are considered to form part of one large meta-population present throughout the survey area.

Due to the temporary nature of the proposed development and the narrow footprint area, it is considered that GCN will not be significantly adversely or permanently affected. However, under the current plans it is likely that five or six (depending on which substation is chosen) water bodies will be temporarily fragmented. Only one water body is known to currently support GCN. Should the route change significantly, so that more water bodies may be affected, further assessment may be required for licensing purposes.

The construction of the AGI / sub-station is likely to result in permanent land-take. However, the preferred locations for the AGI / substation are all located within areas of sub-optimal terrestrial habitat for GCN.

It is recommended that GCN should be temporarily excluded from the working corridor prior to excavation, using short-term habitat management techniques, drift fencing, and / or translocation, which should be agreed once the final route has been confirmed.

Any of the water bodies bisected by the works and suitable to support GCN (regardless of whether proven to contain GCN) should be blocked, drained and all GCN translocated to suitable habitat outside of the working corridor (or managed appropriately during the winter months). On completion of the works it is recommended that the habitat is restored to the same condition prior to development. Landscaping with native species and the provision of hibernacula around the new sub-station location

is considered suitable to compensate for the permanent loss of approximately 1 ha sub-optimum habitat.

SECTION 1

INTRODUCTION

1 INTRODUCTION

1.1 Overview

1.1.1 Parsons Brinckerhoff Ltd (PB) was commissioned by InterGen to undertake a detailed Great Crested Newt (GCN) (*Triturus cristatus*) population and distribution assessment, south and east of Stanford-le-Hope, Essex. The assessment will inform the construction of the proposed gas pipeline and associated AGI / electrical connection and sub-station associated with the Gateway Energy Centre Combined Cycle Gas Turbine (CCGT) Power Station (GEC).

1.1.2 It was identified within the Ecological Scoping Assessment (PB, 2010) that GCN surveys should be undertaken on all water bodies that could potentially support GCN and which could be affected by the proposed development. Surveys were recommended to identify the distribution and abundance of GCN in the area to ensure compliance with the legislation protecting this species.

1.1.3 Potential impacts on GCN have been identified through assessing a combination of data collected in 2008 and 2009 to inform the LG Development, by Thomson Ecology and by PB in 2010.

1.2 Site Context

1.2.1 GEC will be location on land within the LD Development.

1.2.2 The GEC site is situated on the north bank of the Thames Estuary and lies approximately 6 km east of the A13. The A1014 dual carriageway (The Manorway) is located to the north of the site and runs east to west to provide a link with the A13, which in turn links in with the M25 at Junction 30. The River Thames runs in a west to east direction to the south of the site where DP World has recently commenced works on the new port facility associated with the LG Development.

1.2.3 The nearest residential settlements to the GEC site are at Stanford-le-Hope, Corringham and Fobbing which lie approximately 4 km to the west, Canvey Island approximately 5 km to the east, and Basildon approximately 7 km to the north.

1.2.4 To the east of the GEC site is the existing Coryton CCGT Power Station (700 m east), Shell Aviation Fuel Storage Farm and Petroplus' Coryton Oil Refinery (950 m east).

1.2.5 The LG Development comprises a deep-sea global container shipping port (LG Port) and a logistics and commercial centre (LG Logistics and Business Park). These are currently being developed on the site of the former Shell Oil Refinery at Shell Haven near Corringham and Stanford-le-Hope (Essex) on the northern banks of the Thames Estuary.

1.2.6 Prior to planning permission being granted, detailed ecological surveys were undertaken within the LG Development footprint and its immediate surroundings.

1.2.7 The underground gas pipeline and associated AGI are required to deliver the natural gas to be used as fuel by the gas turbines at GEC. At the AGI (OS Grid reference TQ 677 810), the natural gas will be taken from a connection to the existing National Grid National Transmission System (NTaS) Number 5 Feeder pipeline.

1.2.8 From the AGI, the underground gas pipeline will cross a range of arable, marsh and brownfield habitats and an area of land designated as a protected species receptor site for the LG Development, eventually connecting to GEC (OS Grid reference TQ 732 817) (see Figure 1). The underground gas pipeline will be laid using a combination of both surface excavation and horizontal directional drilling (HDD). The pipe is expected to measure approximately 16 inches in diameter and will be laid at a depth of approximately 1.2 m, using a working corridor of approximately 30 m where

HDD is not used. Works are proposed to commence in either 2012 or 2013 and will take approximately six to nine months to complete.

1.2.9 If the electrical connection is over ground, it is likely to be fitted to new overhead pylons. It will run for approximately 6 km from GEC to a sub-station to be consented and constructed by National Grid. At the time of writing there are four possible sub-station locations, all situated to the west of the GEC site. All four possible locations have been included within this assessment (Figure 1). However, it should be noted, that a separate detailed assessment of the four sub-station locations, the inter-connecting cabling and all associated infrastructure is being undertaken independently of this assessment.

1.2.10 The exact alignment / routes and locations of the proposed gas pipeline and associated AGI / electrical connection and sub-station have yet to be finalised. However, the indicative alignment / routes and locations have been established and form the basis of this assessment. The indicative route for the gas pipeline and electricity connection will follow the alignment of an existing CECL Power Station gas pipeline as it is most likely that they will be laid as close to one another as possible to allow for easy management and maintenance. The 'proposed development' for the purposes of this Document therefore includes the gas pipeline and associated AGI / electrical connection and 4 preferred sub-stations.

1.2.11 The presence of GCN was first recorded within the LG Development site and its immediate surroundings by Ecological Services Ltd (ESL) in 2000 during an initial ecological appraisal. Further GCN surveys were carried out in 2001, 2002, and 2006 by ESL to inform an Environmental Impact Assessment for the LG Development.

1.2.12 Thomson Ecology undertook GCN surveys of all the water bodies within the LG Development boundary and a surrounding buffer zone of 500 m in 2008. In 2009 Thomson Ecology undertook further surveys adjacent to the A13/A1014 junction and within a proposed receptor site located immediately west of the LG Development site.

1.2.13 The majority of the proposed development is located outside but in close proximity to the LG Development and as such many of the water bodies located within the survey area of this assessment have already been surveyed for GCN. Much of the data recently collated for the LG development is therefore relevant to this assessment and has been used to form much of its baseline (Figure 3).

1.2.14 Any water bodies within the survey area of this assessment that were not surveyed by Thomson Ecology in 2008 or 2009 were surveyed and assessed by PB in 2010. The Thomson Ecology and PB surveys together ensure that every water body located within a 250 m buffer of the proposed development have been surveyed. A buffer of 250 m either side of the proposed development is considered sufficient to inform this assessment given the extensive information already held on GCN within the area and the temporary nature of the proposed development. This 500 m corridor is defined as the survey area.

1.2.15 The LG Development site contains a large number of water bodies, many of which were found in 2008 to support GCN. However, it is assumed that GCN will be absent within the LG Development at the time of construction as the LG Development site is currently undergoing a large scale translocation programme to remove all GCN from the site into designated translocation receptor sites (the Northern Triangle, Great Garlands Farm Elbow Site and Northern Landscape Site, see Figure 2).

1.2.16 The GCN translocation works commenced in 2008 and are planned to finish at the end of 2010. As the translocation works were incomplete at the time of writing, the total number of GCN which have been translocated into the receptor sites is unknown. However, this report takes into consideration the impact of future increases in GCN populations within and around the receptor sites.

1.2.17 This report collates and assesses the data collected by Thomson Ecology and PB to determine the potential impact of the proposed development on the local and regional GCN population and proposes mitigation measures where necessary.

1.3 Legislation and Planning Context

1.3.1 As European Protected Species, GCN are fully protected under Schedule 5 of the Wildlife and Countryside Act (1981, as amended) and the Conservation of Habitats and Species Regulations 2010 (Habitat Regulations 2010). It is illegal to possess a protected species (alive or dead), deliberately capture, injure or kill, to intentionally or recklessly disturb, or to deliberately take or destroy the eggs of these protected species. It is also illegal to damage, destroy or intentionally or recklessly obstruct access to a breeding or resting place used by these protected species. All life stages of great crested newts are afforded the same level of protection.

1.3.2 Great Crested Newts are listed as an Essex Biodiversity Action Plan (BAP) species, and are a Priority Species under the UK BAP.

1.3.3 The other native newt species within the UK, palmate newts (*Lissotriton helveticus,* or *Triturus helveticus*) and smooth newts (*Lissotriton vulgaris*, or *Triturus vulagris*) are only protected against trade (buying and selling) under the current legislation.

SECTION 2

METHODOLOGY

2 METHODOLOGY

2.1 Introduction

2.1.1 To facilitate the data analysis, the survey area was divided into five distinct 'Areas'. Area 1 was surveyed in 2010 by PB and Areas 2 to 5 (Area 5 being the LG Development itself) were surveyed in 2008 and 2009 by Thomson Ecology. The boundaries of the five areas are illustrated in Figure 1.

2.1.2 All surveys undertaken by Thomson Ecology compiled with standard survey methodologies: Great Crested Newt Mitigation Guidelines' (English Nature, 2001). The numbers allocated to each water body by Thomson Ecology have also been used in this assessment to ensure consistency and to allow the data to be compared if required. The prefixes blue, orange and green distinguish which year the water bodies were surveyed).

2.1.3 Six water bodies that had not been previously surveyed were found to be suitable to support GCN in 2010. These water bodies have been numbered 1-6 and allocated the prefix red (in accordance with Thomson's colour/survey year designations).

2.1.4 Habitat Suitability Index (HSI) assessments (Oldham *et al.,* 2000) were completed on all water bodies within the survey area to determine the likelihood of them supporting GCN. Each water body was then surveyed using three types of methodology, as recommended by Gent & Gibson (2003) and English Nature (2001).

2.1.5 A combination of egg searches, bottle trapping, and torching was undertaken during the 2010 surveys. Where GCN were recorded the minimum requirement of four surveys visits was increased to six to ensure a population survey assessment could be completed (English Nature, 2001).

2.1.6 All surveys were undertaken in optimal conditions between April and June with night time air temperature >5°C and little or no wind, and no rain, in accordance with English Nature (2001).

2.2 Desk Study

2.2.1 A desk study was undertaken in 2010 as part of the Ecological Scoping Report (PB, 2010) and information from previous surveys within the area was reviewed (Thomson 2008 and 2009) to collate any amphibian data within the survey area.

2.3 Field Survey

Habitat Suitability Index (HSI)

2.3.2 HSI assessments of all ponds surveyed by both PB and Thomson Ecology were undertaken. HSI is a tool used to assess the likelihood of a water body to support GCN. It incorporates ten suitability indices (SI), all of which are factors thought to affect GCN, such as the quality of the water and the presence / absence of different predators (particularly fish and waterfowl). Each variable is assessed separately and then mathematically combined to provide a numerical index, between 0 and 1, categorised within Table 2.1. The following equation was used:

$$HSI = (SI_1 * SI_2 * SI_3 * SI_4 * SI_5 * SI_6 * SI_7 * SI_8 * SI_9 * SI_{10})^{1/10}$$

TABLE 2.1: CATEGORISATION OF THE HSI SCORES

HIS	Pond Suitability
<0.5	Poor
0.5-0.59	Below Average
0.6-0.69	Average
0.7-0.79	Good
>0.8	Excellent

2.3.3 Field surveys of the six water bodies within St. Cleres Golf Course were undertaken using standard methodologies as recommended by Gent and Gibson (2003) and English Nature (2001). The surveys were undertaken by NE licensed, PB Ecologists; Tom McArthur (Survey Licence no: 20101436) and Jason Brown (Survey Licence no: 20100177) and Assistant Ecologist, Marianne Curtis. A total of six surveys were undertaken on each water body in accordance with the best practice survey protocols.

Egg Searches

2.3.4 Egg searches were carried out within submerged vegetation. It is necessary to 'unwrap' a folded leaf, in which the egg is hidden, to identify it but this can increase the risk of predation on the egg. Because of this, the survey on each water body ceased as soon as one GCN egg was confirmed. At least 15 minutes of egg searching was conducted per 50m of shoreline, up to a maximum of 30 minutes per water body.

Bottle Trapping

2.3.5 Bottle trapping involved submerging bottle traps, made to a specified design, around the water body margins. The traps were set at dusk and left in the ponds overnight. GCN (and other wildlife) enter into the traps as they move around. The following morning, all the traps were checked, any species caught were recorded and released back into the water and the traps were removed. Following best practice (English Nature, 2001) a density of one trap per two metres of shoreline was employed for each of the ponds surveyed.

Torching

2.3.6 This method involved searching for GCN at night by shining a (>50,000 to <100,000 candlepower) torch over the water bodies. All accessible margins were surveyed during each visit to ensure as much of the water bodies surface area was search as possible.

Thomson Ecology Surveys

2.3.7 The surveys undertaken by Thomson Ecology of all the remaining water bodies in the survey area followed the same best practise methodology as described above. However, in water bodies where bottle trapping or torching could not be undertaken due to a thick coverage of duck weed, shallow water levels or for health and safety reasons, netting was used. This is an acceptable alternative method and the surveys undertaken by Thomson Ecology are therefore considered to be suitable to inform this report.

Netting

2.3.8 Using a long-handled dip net, the perimeter of the water body was walked, with at least 15 minutes of netting conducted per 50m of shoreline, up to a maximum of 30

minutes per water body. Effort was concentrated in areas where GCN were most likely to be found.

2.4 Population Size Class Assessment

2.4.1 It is difficult to establish the true size of a population of GCN. A population can be greatly affected by a range of biotic and abiotic factors and the complex dynamics of metapopulations in which newts exist. However, it is possible to estimate whether a population of GCN are 'small,' 'medium' or 'large' depending on the number of newts recorded torching and bottle trapping surveys (English Nature, 2001).

2.4.2 The maximum adult count from a given pond in one night (taken as the highest count from the six visits) is used to estimate the population size class present in that pond (English Nature 2001).

2.4.3 Assessment of population size determines the population present as either 'small,' 'medium' or 'large'. These categories are based directly on the maximum adult counts of great crested newts at that pond (English Nature, 2001) as follows:

- **Small** – maximum counts up to 10 GCN;
- **Medium** – maximum counts between 11 and 100 GCN;
- **Large** – maximum counts over 100 GCN.

2.4.4 The basis for the use of these estimates is derived from knowledge of the absolute numbers of newts present in areas and the return of the surveys given the level of survey effort (six visits) specified within standard guidelines (English Nature, 2001).

2.5 Survey Limitations

2.5.1 It was not possible to access twelve water bodies located within Coryton Oil Refinery and Coryton Power Station (CECL Power Station) property. Another water body had steep concrete sides, and for reasons of health and safety only torching could be conducted., However, given the number of water bodies that were surveyed across the survey area and the employment of a precautionary approach to population size-class assessment, the omission of these thirteen water bodies is considered unlikely to significantly affect the validity of the assessment.

2.5.2 It is acknowledged that there may have been limited double counting of individual GCN as they are mobile species and data was collected across three consecutive years over a large area.

2.5.3 The use of bottle trapping had to cease in certain water bodies, as water shrews (*Neomys fodiens*) were captured. This technique was however, replaced with netting. Netting was also implemented for six other water bodies (Thomson, 2008), where fluctuating water depth, inaccessibility or dangerous conditions deemed bottle trapping unsuitable.

2.5.4 During the 2009 Thomson Ecology GCN Survey, the use of bottle trapping had to cease in one water body, due to security reasons. However, the survey technique was replaced with netting. The change in methodology does not have a material impact on the validity of the assessment.

2.5.5 Garden ponds were not included in any of the surveys as access was not possible, however, given the number of water bodies that were surveyed across the survey area and the precautionary approach to the population size-class assessment, the omission of several small ponds is considered unlikely to significantly affect the impact assessment.

2.5.6 During the 2010 surveys the water level within the ponds and ditches fluctuated significantly. As a consequence, only 13 traps could be placed in one ditch ('Red 6') which had supported 17 traps during the earlier surveys.

SECTION 3

RESULTS

3 RESULTS

3.1 Desk Study

3.1.1 GCN are listed on the Essex Biodiversity Action Plan (BAP), and as a Priority Species under the UKBAP.

3.1.2 Dedicated surveys were undertaken in 2001, 2002 and again in 2006 throughout the LG Development, associated receptor sites (Figure 2), and a 500 m buffer (Figure 3) (Thomson Ecology 2008 and 2009). Of the 320 water bodies surveyed, great crested newts were present in 44 of them. It was estimated that they comprise 39 small populations and five medium populations. Overall one large meta-population was recorded within the LG Development survey area.

3.2 Field Survey

3.2.1 The survey area is divided into five areas as represented within Figure 1. Area 1 comprised six water bodies and was surveyed in 2010 by PB, Areas 2 to 5 comprised 111 water bodies which were surveyed in 2008 and 2009 by Thomson Ecology.

Habitat Suitability Index (HSI)

Area 1 (2010)

3.2.2 A total of five ponds and one connecting ditch with the potential to support GCN were identified within the 250m buffer area of the proposed development (Figure 5).

3.2.3 The water bodies within Area 1 comprised a mixture of permanent water bodies (ponds 1, 2, 3, and the ditch 6) and non-permanent water bodies (ponds 4 and 5). All water bodies supported submerged and emergent vegetation such as reedmace (*Typha latifolia*), suitable for egg laying. The banks of all water bodies were dominated by grasses. The water bodies were surrounded by a large area of unmanaged grassland and scrub, which provided connectivity between the water bodies and several large hibernacula.

3.2.4 Table 3.1 below summarises the HSI scores for all the water bodies.

TABLE 3.1: SUMMARY TABLE OF HSI RESULTS FOR AREA 1

Suitability Category	HSI Score	Water Body Number
Excellent	>0.8	0
Good	0.7-0.79	3 & 6
Average	0.6-0.69	1, 2, 4, & 5
Below Average	0.5-0.59	0
Poor	<0.5	0
Omitted	n/a	0
	Total:	**6**

3.2.5 All the water bodies within the area had an HSI rating of average to good and were subsequently considered to be suitable to support GCN. Full details of the HSI assessment are presented within the Appendix.

Area 2 (2008/9)

3.2.6 A total of 22 water bodies were identified within Area 2. Of these, only 12 were considered suitable for GCN (Table 3.2) and were found to have HSI scores of good to excellent (see the Appendix for full details). Of the remaining 10, two water bodies were managed for commercial fishing and eight were found to be dry at the time of

survey (and when re-checked by PB in 2010, these were not considered to be suitable for GCN). These 10 water bodies were omitted from the survey.

TABLE 3.2: SUMMARY TABLE OF HSI RESULTS FOR AREA 2

Suitability Category	HIS Score	No. of Water bodies
Excellent	>0.8	8
Good	0.7-0.79	4
Average	0.6-0.69	0
Below Average	0.5-0.59	0
Poor	<0.5	0
Omitted		10
	Total:	**22**

Area 3 (2008/9)

3.2.7 A total of 30 water bodies were identified within Area 3. The water bodies predominantly comprised of a network of ditches and two ponds, of these a total of 17 were considered suitable to support GCN. Of these 17 water bodies, 11 obtained an HSI score between average-excellent, with six obtaining a score of below average (Table 3.3). One of the water bodies that scored 'below average' and was considered not suitable to support GCN in 2010 as it had been contaminated. The other 13 water bodies identified within Area 3 were found to be dry in 2008 (and also in 2010 when re-checked), and were therefore omitted from the survey.

TABLE 3.3: SUMMARY TABLE OF HSI RESULTS FOR AREA 3

Suitability Category	HSI Score	No. of Water bodies
Excellent	>0.8	1
Good	0.7-0.79	5
Average	0.6-0.69	5
Below Average	0.5-0.59	6
Poor	<0.5	0
Omitted		13
	Total:	**30**

Area 4 (2008/9)

3.2.8 A total of 30 water bodies were identified within Area 4. The water bodies comprised a network of ditches and four ponds. A total of 18 water bodies were considered to be suitable to support GCN, 16 scored between 'average' and 'excellent,' with two scoring 'below average' and one obtaining a score of 'poor' (Table 3.4). The water body that resulted in a 'poor' result was considered unsuitable to support GCN in 2010.

3.2.9 The other 11 water bodies were omitted from the survey as they were found to be dry in 2008 and also in 2010 when re-checked.

TABLE 3.4: SUMMARY TABLE OF HSI RESULTS FOR AREA 4

Suitability Category	HSI Score	No. of Water bodies
Excellent	>0.8	6
Good	0.7-0.79	9
Average	0.6-0.69	1
Below Average	0.5-0.59	2
Poor	<0.5	1
Omitted		11
	Total:	**30**

Area 5 (2008/9)

3.2.10 A total of 30 water bodies were identified within Area 5, some of which comprised a number of water bodies, but were categorised as one due to their proximity to each other. The water bodies within Area 5 comprised a mixture of drainage ditches, ponds, and marshy areas. A total of 18 water bodies were considered suitable to support GCN. Of these 18 water bodies, 16 obtained an HSI score between average and excellent and two scored 'below average' (Table 3.5).

3.2.11 Two water bodies were omitted from the survey as they were concrete channels with steep sides. In addition, an area of flooded marsh that obtained an 'average' HSI score was omitted from further survey as it was not considered suitable (it was very shallow and likely to dry out). A further ten water bodies were found to be dry and were therefore omitted from further survey.

TABLE 3.5: SUMMARY TABLE OF HSI RESULTS FOR AREA 5

Suitability Category	HSI Score	No. of Water bodies
Excellent	>0.8	10
Good	0.7-0.79	4
Average	0.6-0.69	2
Below Average	0.5-0.59	2
Poor	<0.5	0
Omitted		12
	Total:	**30**

3.2.12 A total of 75 water bodies present within the total survey area were considered to be suitable to support GCN and were subject to detailed survey.

Field Survey Results

3.2.13 The detailed surveys were completed in optimal weather conditions between April and June. Details of each survey including the dates, weather conditions and surveyors are provided in Table 3.6.

TABLE 3.6: DETAILS OF SURVEY VISITS

Date	Weather Conditions	Ponds Surveyed	Survey Method	Surveyors
29.04.2010	Light wind, 5/8 cloud cover, temperature 8.5°C.	1, 2, 3, 4, 5, and 6	Torching	Tom McArthur & Jason Brown
30.04.2010	Light wind, 5/8 cloud cover, temperature 8.5°C.	1, 2, 3, 4, 5, and 6	Bottle Traps	Tom McArthur & Jason Brown
13.05.2010	Slight breeze, 4/8 cloud cover, sporadic patches of rain (but not during survey), temperature 10°C.	1, 2, 3, 4, 5, and 6	Torching	Jason Brown & Marianne Curtis
14.05.2010	Warm, slight breeze, 4/8 cloud cover, temperature 15°C.	1, 2, 3, 4, 5, and 6	Bottle Traps	Jason Brown & Marianne Curtis
17.05.2010	Slight breeze 0/8 cloud cover, temperature 10°C.	1, 2, 3, 4, 5, and 6	Torching	Jason Brown & Marianne Curtis
18.05.2010	Slight breeze, 0/8 cloud cover, temperature 15°C.	1, 2, 3, 4, 5, and 6	Bottle Traps	Jason Brown & Marianne Curtis
20.05.2010	Light breeze, 0/8 cloud cover, temperature 14°C.	1, 2, 3, 4, 5, and 6	Torching	Jason Brown & Marianne Curtis
21.05.2010	Breezy, 6/8 cloud cover, temperature 13°C.	1, 2, 3, 4, 5, and 6	Bottle Traps	Jason Brown & Marianne Curtis
25.05.2010	Slight breeze, 0/8 cloud cover, temperature 13°C.	1, 2, 3, 4, 5, and 6	Torching	Jason Brown & Marianne Curtis
26.05.2010	Slight breeze, 4/8 cloud cover, temperature 16°C.	1, 2, 3, 4, 5, and 6	Bottle Traps	Jason Brown & Marianne Curtis
03.06.2010	Slight breeze, 0/8 cloud cover, temperature 12°C.	1, 2, 3, 4, 5, and 6	Torching	Jason Brown & Marianne Curtis
04.06.2010	Calm, 3/8 cloud cover, temperature 15°C.	1, 2, 3, 4, 5, and 6	Bottle Traps	Jason Brown & Marianne Curtis

Area 1 (2010)

3.2.14 GCN and smooth newts were recorded in all water bodies surveyed. No palmate newts were recorded during the surveys. Refer to the Appendix for raw data.

3.2.15 GCN were recorded at all stages of their life-cycle (eggs, efts, juveniles and adults) in all water bodies located within Area 1, the highest number of GCN were recoded within the ditch where a maximum of eight GCN were recorded within a single visit (25th May 2010, see Appendix 2 for full details). The population size for each of the water bodies present within Area 1 is therefore considered to be 'small' English Nature (2001) (Table 3.7).

3.2.16 For sites where there is reasonable certainty that there is regular interchange of animals between ponds (typically within 250 m and with the absence of barriers to dispersal), maximum counts during one survey and using one method can be summed across ponds. As the six water bodies within Area 1 are located within 250 m if one another without any barriers, the summed count is 28 individuals, considered to be a medium sized meta-population.

TABLE 3.7: SUMMARY OF THE PEAK COUNT OF ADULT GCN AND POPULATION CLASSIFICATION OF AREA 1

Water body*	Peak Adult Count	Population Size Class Assessment
Red 1	2	Small
Red 2	6	Small
Red 3	7	Small
Red 4	3	Small
Red 5	2	Small
Red 6	8	Small

* Please refer to Fig 6 for the locations of the water bodies.

Area 2 (2008/9)

3.2.17 Within Area 2 six water bodies were recorded supporting GCN. Three water bodies supported 'medium' sized GCN populations and the remaining three supported 'small' GCN populations (see Table 3.8). See Figure 6 for the spatial distribution of the populations.

3.2.18 It is unknown whether or not GCN were recorded at all stages of their life cycle, as only peak adult counts were recorded within the Thomson Ecology 2008 & 2009 GCN reports. A precautionary approach is therefore taken, which considers that all populations of GCN found within Areas 2-5 are breeding populations.

3.2.19 It is considered likely that GCN will move between the waterbodies in this area (as they are well connected and closely associated). However, it is not possible to sum counts for the survey area as it is not known whether peak counts for each water body were recorded using one method on one survey occasion. However, using a precautionary approach, assuming that there is interchange between waterbodies, it is considered that a medium sized metapopulation is present.

TABLE 3.8: SUMMARY OF THE PEAK COUNT OF ADULT GCN AND POPULATION CLASSIFICATION OF AREA 2

Water body*	Peak Adult Count	Population Size Class Assessment
Green 114a	2	Small
Green 116	12	Medium
Green 117	18	Medium
Green 176	4	Small
Green 177	8	Small
Green 179	15	Medium

* Please refer to Fig 6 for the locations of the water body.

Area 3 (2008/9)

3.2.20 Within Area 3 five water bodies were recorded supporting GCN. One water body supported a 'medium' sized population of GCN, the remaining four water bodies supported 'small' GCN populations (Table 3.9). See Figure 6 for the spatial distribution of the populations.

3.2.21 It is considered likely that GCN will move between the waterbodies in this area (as they are well connected and closely associated). However, it is not possible to sum counts for the survey area as it is not known whether peak counts for each water body were recorded using one method on one survey occasion. However, using a precautionary approach, assuming that there is interchange between waterbodies, it is considered that a medium sized metapopulation is present.

TABLE 3.9: SUMMARY OF THE PEAK COUNT OF ADULT GCN AND POPULATION CLASSIFICATION OF AREA 3

Water body*	Peak Adult Count	Population Size Class Assessment
Green 25	1	Small
Blue 10	6	Small
Blue 16	1	Small
Orange 122	23	Medium
Orange 125/ Blue 12	1	Small

* Please refer to Fig 6 for the locations of the water body.

Area 4 (2008/9)

3.2.22 Two water bodies within Area 4 were recorded supporting GCN. Both water bodies were found to support 'small' GCN populations (Table 3.10). See Figure 6 for the spatial distribution of the populations.

3.2.23 The Northern Triangle Receptor site lies within Area 4 (See Figure 2). This site has been designed to support a large number of translocated GCN from the LG development site. It is currently being managed and enhanced specifically for GCN. Twenty four new ponds have been created and are to be managed amongst optimal terrestrial habitat. It is therefore envisaged that the population of GCN within the Northern Triangle will be of a 'medium-large' size class.

3.2.24 It is considered likely that GCN will move between the waterbodies in this area (as they are well connected and closely associated). However, it is not possible to sum

counts for the survey area as it is not known whether peak counts for each water body were recorded using one method on one survey occasion. However, using a precautionary approach, assuming that there is interchange between waterbodies, it is considered that a small sized metapopulation is present. This is however likely to increase to a medium-large sized meta-population following the translocation.

TABLE 3.10: SUMMARY OF THE PEAK COUNT OF ADULT GCN AND POPULATION CLASSIFICATION OF AREA 4

Water body*	Peak Adult Count	Population Size Class Assessment
Green 48	1	Small
Blue 29	1	Small

* Please refer to Fig 6 for the locations of the water body.

Area 5 (2008/9)

3.2.25 Within Area 5 eight water bodies had GCN present. One water body supported a 'medium' population of GCN; seven water bodies were found to support 'small' populations of GCN (Table 3.11). See Figure 6 for the spatial distribution of the populations.

3.2.26 It is considered likely that GCN will move between the waterbodies in this area (as they are well connected and closely associated). However, it is not possible to sum counts for the survey area as it is not known whether peak counts for each water body were recorded using one method on one survey occasion. However, using a precautionary approach, assuming that there is interchange between waterbodies, it is considered that a medium sized metapopulation is present.

TABLE 3.11: SUMMARY OF THE PEAK COUNT OF ADULT GCN AND POPULATION CLASSIFICATION OF AREA 5

Water body	Peak Adult Count	Population Size Class Assessment
Blue 26*	3	Small
Blue 113	1	Small
Orange 2 / Blue 58	20	Medium
Orange 20	1	Small
Orange 38	3	Small
Orange 57 / Blue 72	4	Small
Orange 85 / Blue 24	6	Small
Orange 119	1	Small

* Please refer to Fig 6 for the locations of the water body.

3.2.27 As all the surveyed water bodies across Areas 1 - 5 are located within 100 m of at least one other water body, it is likely that there will be a high degree of interchange between the GCN. As a precaution, to account for the potential variation and limitations associated with data collected across several years by different surveyors, it is considered that there is an overall large site wide meta-population.

SECTION 4

DISCUSSION & RECOMMENDATIONS

4 DISCUSSIONS & RECOMMENDATIONS

4.1 Overview

4.1.1 A total of 118 water bodies were identified within 250 metres of the proposed development. Of these 118 water bodies identified, GCN were recorded in 28 of them. In each of these water bodies, at least one of the life stages (egg, larva, and adult) of great crested newt was recorded by bottle trapping, torching surveys, egg searches or netting. Of the 28 water bodies found to support GCN, five supported 'medium' populations and 23 supported 'small' populations.

4.1.2 Suitable terrestrial habitat for GCN such as coarse grassland, dense and scattered scrub, hedgerows, marshy grassland, poor semi-improved grassland, and broad-leaved woodland, occur throughout the survey area. These habitats provide connectivity and potential migration routes between the water bodies. Taking this into account, along with the use of a precautionary approach due to survey limitations, it is considered that the survey area has the potential to support a large metapopulation of GCN.

4.1.3 Other amphibians encountered during the surveys included smooth newts, these were observed in all water bodies in Area 1. There are no written records of other amphibians in Areas 2-5. However, due to the presence of large areas of suitable connected habitat, it is likely that they are present throughout the survey area.

4.1.4 The data obtained for this report has been acquired from surveys undertaken over a number of years. During this time, extensive GCN translocations have commenced under the 'London Gateway Ecological Mitigation and Management Plan'. Under this plan, GCN within the LG Development area (Area 5) are being captured, translocated and released in receptor sites including the Northern Triangle, Great Garlands Farm Elbow Receptor Site, and the Northern Landscape Receptor Site, all of which are partially located within the survey area. The receptor sites will be managed for GCN, through the creation and enhancement of suitable aquatic and terrestrial habitat. Therefore it is likely that the data acquired from the 2008 reports may now be different from current conditions with a higher concentration of GCN in and around the receptor sites. However, this is not considered to significantly affect the assessment and recommendations given within this report as the locations of the receptor sites are known, the numbers of GCN are not likely to change beyond any natural annual fluctuations and the recommendations provided below have are based on a precautionary large meta-population.

4.1.5 Construction of the proposed development would result in the temporary loss of five water bodies (all ditches located within Area 4, one of which is known to support GCN: Blue 29). In addition, there would be loss of optimal and sub-optimal terrestrial habitat and indirect disturbance along the majority of the alignment (including increased lighting, noise and vibration). The 30 m wide working corridor associated with the connection of the pipe or cable and reinstatement of the ground is anticipated to take approximately six months. It is understood that the entire route would be fenced, the topsoil stripped, and trench excavated for the entire length of the pipeline prior to construction commencing. The temporary habitat loss would result in the fragmentation of the survey area for approximately six months with tens of water bodies situated on either side. Indirect disturbances are only envisaged at any one point along the route for up to two weeks as the pipe or cable is laid iteratively. Increased noise, light and vibration disturbance and an increase in dust deposition are therefore likely to be highly localised and very temporary in nature.

4.1.6 Due to the large number of suitable water bodies located within and around the survey area, it is highly likely that GCN will be able to access at least one water body suitable for breeding throughout the construction period. Additionally, given the large

number of water bodies and suitable foraging habitat throughout the survey area it is considered unlikely that GCN will migrate large distances to feed or breed. Therefore temporary obstruction to dispersal is not considered likely to affect breeding or foraging opportunities. Furthermore, as the construction works will be completed during the spring and summer months, fragmentation will not affect any hibernating GCN. No permanent adverse impacts on the local GCN population are therefore anticipated.

4.1.7 The proposed development is envisaged to only directly bisect one water body known to support a small population of GCN (Blue 29). The bisection of the water body would result in direct habitat loss and disturbance of the GCN population. The water body would be reinstated post-works and thus the loss is considered to be temporary.

4.2 Impact Assessment of Survey Areas 1 – 5

Area 1

4.2.1 All six water bodies (Red 1-6) located within Area 1 are surrounded by a large area of suitable terrestrial habitat currently being managed specifically for nature conservation purposes by St. Cleres Golf Course. The pipeline connects to the substation located on the southern boundary of St. Cleres Golf Course, some 150 m east of the water bodies and runs east through an arable field (away from the six water bodies). The excavation will therefore result in the temporary loss of sub-optimum terrestrial habitat and given the location of the construction works to the known water bodies (all located >100 m to the west is unlikely to obstruct access to suitable habitat.

Area 2

4.2.2 Within Area 2, six water bodies supported GCN (Table 3.8 and see the Appendix for more details). The pipeline would run directly through two water bodies (Green 176 & 177) known to support small populations of GCN, however, the majority of the route within Area 2 will be tunnelled using HDD technology. The only envisaged impact would therefore be at and around the access and egress points of the bore hole. The exact site locations have yet to be confirmed but it is understood that they will be located within arable fields, at least 50 m from aquatic habitat which is regarded as being suboptimum for GCN.

4.2.3 The site footprint for each bore hole and associated traffic access is likely to require a larger area of land than the 30 m wide buffer required for the trench excavation; potentially resulting in a larger area of temporary habitat loss. The tunnelling works may also take longer than several weeks to complete at each location. These HHD works are therefore likely to lead to proportionally greater localised noise and vibration disturbances than those associated with the trench excavation. However, it should be acknowledged that the remainder of the HDD route is likely to remain unaffected as the pipeline or cable is laid deep underground. Assuming that the works occur within the centre of arable fields and access vehicles utilise existing roads and tracks, the impacts on GCN are likely to be temporary on an area of sub-optimal GCN terrestrial habitat and wouldn't lead to the fragmentation of any optimum habitat. Further assessment and full recommendations associated with the HDD compounds should be reviewed once the final locations of the compounds have been agreed.

Area 3

4.2.4 Five water bodies were found to support GCN within Area 3 (Green 25, Blue 10 & 16, Orange 122 & Orange 125/Blue 12). Pond Orange 122 located within Great Garlands Farm is surrounded by suitable terrestrial habitat for GCN; and is located approximately 100 m from the pipeline. Pond Orange 125/Blue 12 is situated south of part of the Great Garlands Farm Elbow Receptor Site and approximately >150 m from

the pipeline. In addition to these ponds, 12 further waterbodies ponds were found suitable to support GCN, but presence was not confirmed at the time of survey.

4.2.5 The number of newts translocated into Area 3 is unknown as translocation is not scheduled to finish until the end of 2010. However, it is likely that a medium to large population of GCN will occur within the water bodies of the Great Garlands Farm Elbow Receptor Site following translocation. All waterbodies in the area with confirmed GCN presence are currently separated from the proposed development by GCN protection fencing, however, it is understood that this fencing would be removed prior to the commencement of the proposed development. This would result in the temporary fragmentation of suitable terrestrial from aquatic habitat and would restrict access between some of the water bodies located on either side of the proposed development. As outlined above however (4.1.6), no one water body or area of suitable terrestrial habitat will become isolated.

4.2.6 The development of the substations and potentially the construction of new national grid pylons within Area 3 would result in the permanent loss of approximately 1 hectare of terrestrial habitat 250m from confirmed aquatic habitat (and approximately 10 m from suitable, but not confirmed aquatic habitat). The construction of any new pylons, which is yet to be confirmed, would result in the temporary disturbance of the ground but the permanent loss of a negligible amount of land (the feet of the pylon). Furthermore, the locations of the pylons are likely to be located in areas of sub-optimum habitat such as arable fields > 50 m from waterbodies.

4.2.7 The substation option 5a, located in Area 3 is situated amongst arable fields that provide little or no value for GCN. The site location will be bounded by dry ditches to the east and west and one wet ditch (devoid of GCN and not identified as suitable for GCN) approximately 50 m to the south. Assuming the footprint of the entire substation compound would occur completely within the arable field and that existing roads are used for access, the impact of this substation is considered to be negligible in regards to GCN.

4.2.8 Substation option 5b, however, is located in an area of land adjacent to an industrial estate that supports a patchwork of habitats associated with brown field sites. Although this habitat is considered suitable for hibernating and foraging GCN, no GCN were recorded in the three water bodies located within 250m of this area. As a result of connectivity to known breeding ponds beyond 250 m however, for the purposes of this assessment, GCN are assumed to be present in this optimum habitat.

4.2.9 Areas 3 also supports substation option 10, located between Old Garlands farm and Old Hall farm. This possible substation location is situated within an arable field, considered to be sub-optimum for GCN. A 1.5 – 3 wide ditch flows north to south across the location and assuming the substation's location is not amended would be fragmented during construction. No GCN were recorded within the ditch, which was not considered suitable but they were recorded approximately 150 m to the east and west.

Area 4

4.2.10 Area 4 was found to contain two water bodies supporting GCN (Green 48, and Blue 29). Green 48 is situated <250 m distant from any area of impact. However, the pipeline is likely to bisect Blue 29, a wet drain that ran directly across the 500 m wide survey corridor, north to south. The majority of land bisected by the pipeline within Area 4 comprised large, well managed arable fields separated by a network of connected drainage ditches and hedgerows that provided suitable terrestrial and aquatic habitat for newts, especially for commuting across the landscape. An additional four wet ditches, all suitable for GCN are likely to be temporarily fragmented.

4.2.11 Option 1 of the preferred substation sites is located to the north of Area 4. The permanent land loss associated with the substation option is unlikely to significantly affect GCN within the area as it is located within arable fields that provide little or no value for GCN and that are beyond 50 m of a breeding pond or water body considered suitable to support GCN. Assuming that the construction compound of the substation is located completely within the arable field and access vehicles utilise existing roads and access points, the impact of the substation is likely to be negligible in regards to GCN.

4.2.12 The Northern Triangle (Figure 2), a GCN Receptor Site for the LG Development lies within Area 4. This site is managed under a Natural England European Protected Species Licence and is thus subject to stringent legal requirements and conditions. The habitat creation and enhancement plans for the Northern Triangle (East) include the creation of 24 ponds within an area of 27 ha. The proposed development currently runs inside the southern boundary of the Northern Triangle although and it is understood that it will avoid all of the ponds. Any works within the Northern Triangle will require detailed consideration and negotiation with Natural England to ensure that the site's conservation value is maintained and the works are legally compliant.

Area 5

4.2.13 Area 5, located within the LG development, contained eight water bodies which supported GCN in 2008 and an additional 22, considered suitable for GCN, however, GCN translocation from the LG Development into the surrounding receptor sites, the filling-in of the ponds and the levelling of the area under the relevant permissions has begun. It is expected that no GCN or habitat suitable to support GCN will be present within Areas 5 or the LG Development by the time construction of the proposed pipeline commences. The pipeline construction is therefore considered unlikely to impact on GCN here.

4.2.14 The Northern Landscape south of The Manorway (A1014) has been identified as a GCN receptor site for the LG Development whereby habitat creation and enhancement will occur; with the creation of 22 ponds within the area (see Figure 2 for receptor site location). This area is separated from the proposed development by The Manorway, yet is included within the 250m buffer area as there are plans to create GCN tunnels under the road to facilitate migration between the habitats either side of the Manorway (Thompson Ecology, 2008).

4.2.15 Assuming the GCN tunnels would be constructed prior to the commencement of the indicative route the construction works would obstruct access between the Northern Landscape and the land to the north of the road including the Northern Triangle receptor site and Fobbing Marshes SINC. However, the Northern Landscape would not be isolated during the construction timeframe as GCN will be able to move between the receptor site and Area 3 via the Northern Landscape's western boundary.

4.2.16 The impacts from any habitat loss, fragmentation or disturbance is considered to be of negligible significance within Area 5 following the completion of the vegetation clearance and site levelling as part of the LG Development.

Summary

4.2.17 In summary, the construction of the proposed development would lead to temporary fragmentation and disturbance of the local GCN population with limited patches of permanent suboptimum habitat loss. It is envisaged that one water body known to support a small population of GCN (Area 4) would be directly affected and five or six (depending on which substation is chosen) others which do not currently support GCN but have potential would also be temporarily fragmented. The majority of the impacts are therefore restricted to the temporary loss and fragmentation of suitable

habitat. Although these impacts are not likely to permanently adversely affect the known large meta-population, they would need to be mitigated to ensure the adverse impacts on the GCN population were reduced to negligible and where possible, the population is benefited.

4.3 General Recommendations

4.3.1 The presence of small-medium populations of GCN throughout the survey area and the quantity of suitable connective terrestrial and aquatic habitats indicate that a large metapopulation of GCN is likely to occur within and immediately surrounding the survey area. The recommendations presented within this report have therefore been designed to avoid and mitigate any envisaged impacts on a 'large' population. They are therefore considered sufficient to account for the expected movement of GCN and increases in population size within the receptor sites.

4.3.2 No evidence of great crested newts was recorded in 90 of the water bodies present within the survey area, however 75 water bodies were considered suitable to support GCN. These water bodies are well connected by a network of drainage ditches and hedgerows, it is possible and likely that GCN will colonise other water bodies within the locality. Therefore a precautionary approach is recommended whereby the presence of GCN is assumed and the recommendations are therefore applicable to all ponds and suitable terrestrial habitat within the area.

4.3.3 It has been identified that the GCN population would be potentially adversely affected by the proposed works. The disturbance of a European protected species, such as a GCN is illegal unless the impacts are sufficiently reduced, mitigated and where appropriate, the works are completed under a Natural England (NE) Development Licence. A NE development licence will therefore be required to exclude GCN from the working corridor prior to excavation. An application would require the submission of a Method Statement for the works. The licence application contains details of the proposed mitigation works and will have to clearly demonstrate that there is no satisfactory alternative. The mitigation measures must show that works will not be of detriment or have a significant impact upon the great crested newt population, which must remain at a favourable conservation status.

4.3.4 It is likely that GCN would need to be temporarily excluded from the working area to maintain legal compliance. This temporary exclusion would require a combination of short-term habitat management and fencing. The application of targeted vegetation clearances during the winter months when GCN are not active would encourage GCN to move naturally into adjacent more suitable habitat during the spring months and away form the proposed development's footprint. Protective GCN fences would also be required around sections where GCN are most likely to occur (along habitat corridors and near breeding ponds) to prevent any excluded GCN from re-entering the works site.

4.3.5 Should it not be possible to exclude GCN from the proposed development, it may be necessary to fence the area and use pitfall traps to capture and translocate GCN found within the 30 m wide working corridor. However, this option can be significantly more expensive as more fencing would be required and under licence there would be a requirement to undertake the trapping for between 30 to 90 days, until no GCN are found on five consecutive days of suitable weather.

4.3.6 The use of designated receptor sites are not considered necessary at this stage as the survey area supports a large number of aquatic and terrestrial habitats, which are suitable to support GCN and would remain unaffected.

4.3.7 It is recommended that the water body (Blue 29), which is likely to be directly bisected by the pipeline, is blocked using bunds and that the water carefully drained and any resident GCN translocated to suitable habitat outside of the working corridor. On

completion of this section of the pipeline, it is recommended that the habitat is restored to an improved condition. It is recommended that no works should take place in the water bodies during the breeding season between March and end of June (and should preferably be undertaken during the winter months when GCN will be absent). Although the other water bodies in Area 4 were not found to support GCN at the time of survey, they are well connected to water body Blue 29 and may support small populations in the future. Therefore, as a precautionary measure all ditches and drains crossed by the proposed development should also be subject to the same mitigation.

4.3.8 The two most important periods within the GCN lifecycle are the hibernation and breeding season, it is recommended that work on areas suitable for hibernating or breeding GCN within this period should be avoided where it affects breeding or hibernation habitat. The timing of the works would dependant on the type of works required. The vegetation clearances of habitat not considered suitable for hibernating GCN should be undertaken during the winter months, where as any translocation must be completed during early spring (February-March) or early autumn (July-October), to coincide with the species most active period.

4.3.9 The Northern Triangle Receptor Site is legally protected under a pre-existing NE licence. Following the translocation schedule for the LG Development Site, it is likely that the Northern Triangle would support a large population of GCN with optimal terrestrial and aquatic habitat throughout. It is therefore recommended that wherever possible this area is bypassed or tunnelled underneath using HDD technology. Any development within or around the immediate vicinity of the Northern Triangle should be undertaken following consultation with and approval from Natural England.

4.3.10 It is recommended that where possible water bodies and hedgerows, which provide good terrestrial habitat within the survey area, should be bypassed and retained. The trench should be moved, where possible, within the 30m corridor to ensure minimum disturbance is caused.

4.3.11 In the unlikely event that GCN are discovered within the working corridor once works commence, all works must cease immediately and either the acting Ecologist or Natural England should be contacted for advice.

4.3.12 If any smooth newts, common frogs or common toads are found during the development works they should be removed carefully by hand to areas away from the development works, such as hedgerows or woodland not to be affected by the works.

4.3.13 All habitats recorded within the working corridor would be fully reinstated following the completion of works. Due to the temporary nature of the works and the lack of any long term or permanent adverse impacts, it is unlikely that any further compensation, such as habitat creation or manipulation would be required, especially given the large and widespread habitat creation that has been implemented under the LG development. The landscaping and the provision of hibernacula around the new sub-station and within suboptimum habitat would compensate for the permanent loss of sub-optimum habitat and provide net gain for GCN. All plants should be native and of local provenance.

4.3.14 The survey area has been designed around the alignment of an existing gas pipeline because, at the time of writing, the final linear route alignment had not been agreed. The recommendations made within this Phase II report are therefore intrinsically linked to the indicative route of the proposed development. Should the final route differ significantly from the indicative alignment it could affect water bodies outside of the survey area that were not considered within this report, and further detailed surveys might be required.

4.3.15 The assessment is based on the results of the 2008, 2009 and 2010 surveys in Areas 1 - 5. In addition to those ponds where presence was confirmed; in each area a number of ponds were considered suitable to support GCN and a further number were considered not suitable for GCN. Due to the potential for interchange and changes in habitat dynamics, it is possible that these ponds may become occupied at a later date. The impact assessment and mitigation recommendations consider all ponds with confirmed presence and those considered suitable for GCN. It is recommended that a walkover survey should be undertaken to check for habitat changes, which may have resulted in previously unsuitable areas becoming suitable for GCN.

SECTION 5

CONCLUSIONS

5 CONCLUSIONS

5.1.1 Small populations of GCN were recorded in 23 water bodies and medium populations were recorded in five water bodies located within the 250 m buffer zone. The development works are likely to directly impact upon one water body, which is known to support GCN, five or six other water bodies known not to support GCN and a large area of suitable terrestrial habitat. However, the development is not likely to result in the permanent loss of any water bodies, or terrestrial habitat that is considered to be of value to GCN. All habitats that will be temporarily removed will be re-established following completion of the works.

5.1.2 A Natural England development licence would be required for the temporary exclusion and translocation of GCN from within the final route alignment; to temporarily remove habitat; and to ensure all works are fully legally compliant. Winter management of the vegetation located within the working corridor is likely to encourage the majority of the GCN population to naturally move to more suitable habitats off site. Where hibernation habitat exists, vegetation management could be commenced during the autumn (to remove potential). It is likely that areas of the pipeline corridor would also need to be fenced to prevent any excluded GCN moving back into the area. Any residual GCN located within the fence line should be trapped and moved outside of the working corridor. The one water body known to be directly affected would need to be bunded, drained and ensured it was free from GCN before works commenced (or managed during the winter months). These requirements are subject to the confirmation of the final route alignment. Limited planting of native species of local province and the creation of hibernacula around the new substation is considered sufficient to compensate for the permanent loss of sub-optimum habitat.

5.1.3 Due to the temporary nature of the proposed scheme, it is considered that the long-term ability of this area to be used by GCN and other amphibians will not be affected by the proposals. Mitigation measures set out within this report are designed so that the disturbance, habitat loss and fragmentation impacts associated with the route are likely have a minimal impact GCNs and other amphibian species within the area. No further habitat creation or manipulation has been recommended at this stage.

SECTION 6

REFERENCES

6 REFERENCES

ENGLISH NATURE (2001) Great Crested Newt Mitigation Guidelines (August 2001 version). English Nature, Peterborough.

FROGLIFE (2001) Great Crested Newt Conservation Handbook. Froglife, Mansion House, Halesworth, Suffolk.

JOINT NATURE CONSERVATION COMMITTEE (1998) 'Herpetofauna Workers Manual' Gent, A. & Gibson, S. (eds). JNCC, Peterborough.

Oldham R.S., Keeble J., Swan M. J. S. and Jeffcote M. (2000) *Evaluating the suitability of habitat for the great crested newt (Triturus cristatus*). Herpteological Journal, Vol. 10 pp. 143-155.

Parsons Brinckerhoff (2010), Gateway Energy Centre Ecology Scoping Report. Parsons Brinckerhoff for InterGen.

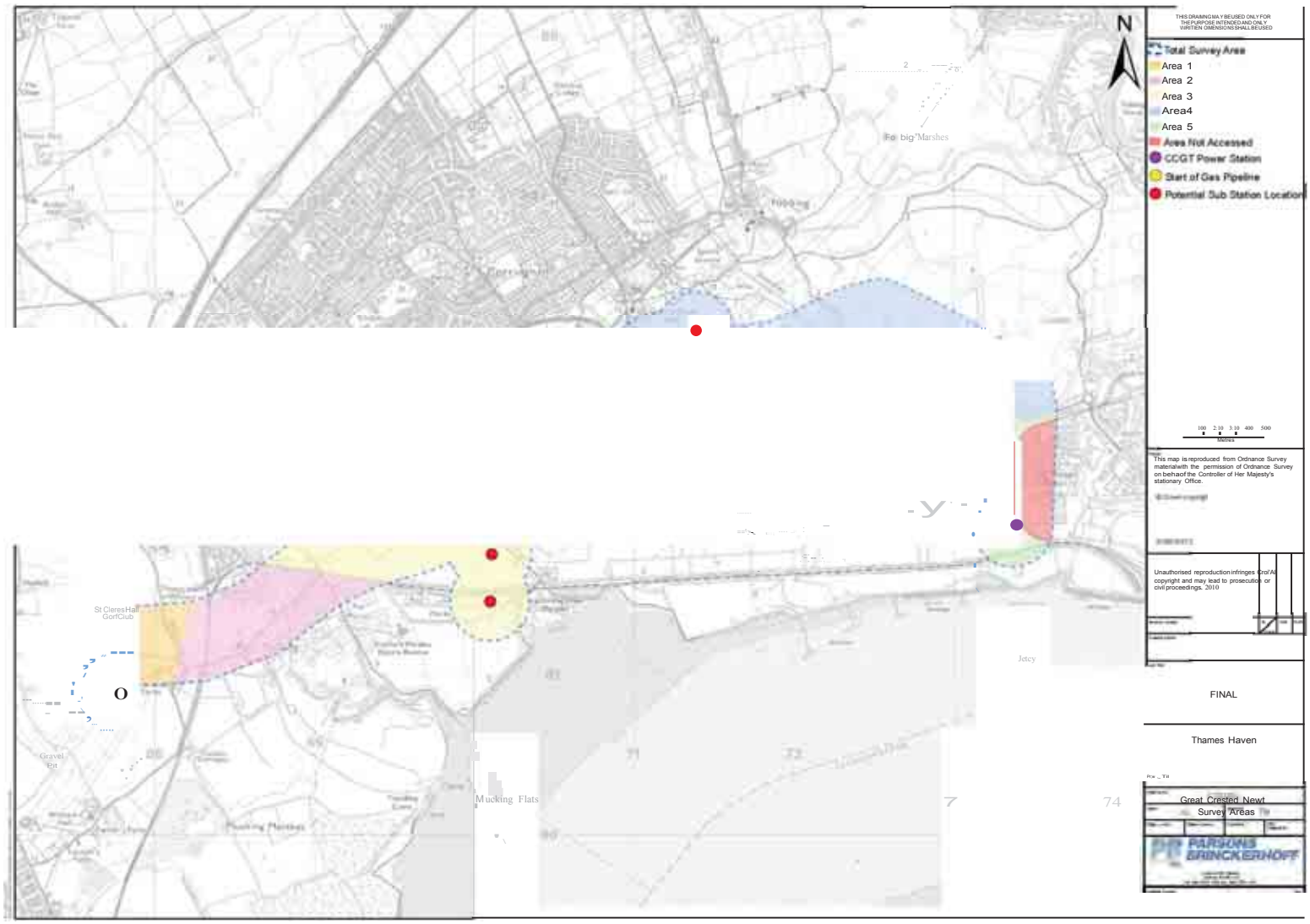
Thomson Ecology (2008) Great Crested Newt Survey. Thomson Ecology for DP World.

Thomson Ecology (2008) Great Crested Newt Ecological Habitat Management and Maintenance Plan. Thomson Ecology for DP World.

Thomson Ecology (2009) Great Crested Newt Survey for A13/A1014 Junction, Off-site Rail Bend and Great Garlands Farm Elbow Receptor Site. Thomson Ecology for DP World.

FIGURES

FIGURE 1 : LOCATION OF THE SURVEY AREA & THE CCGT SITE LOCATION, GAS INLET LOCATIONS, 3 POSSIBLE SUBSTATIONS & HOW THE SURVEY HAS BEEN DIVIDED INTO 5 SEPARATE SMALLER AREAS


N
THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED
Total Survey Area
Area 1
Area 2
Area 3
Area4
Area 5
Area Not Accessed
CCGT Power Station
Start of Gas Pipeline
Potential Sub Station Location
100 2:10 3:10 400 500
Metres
This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's stationary Office.
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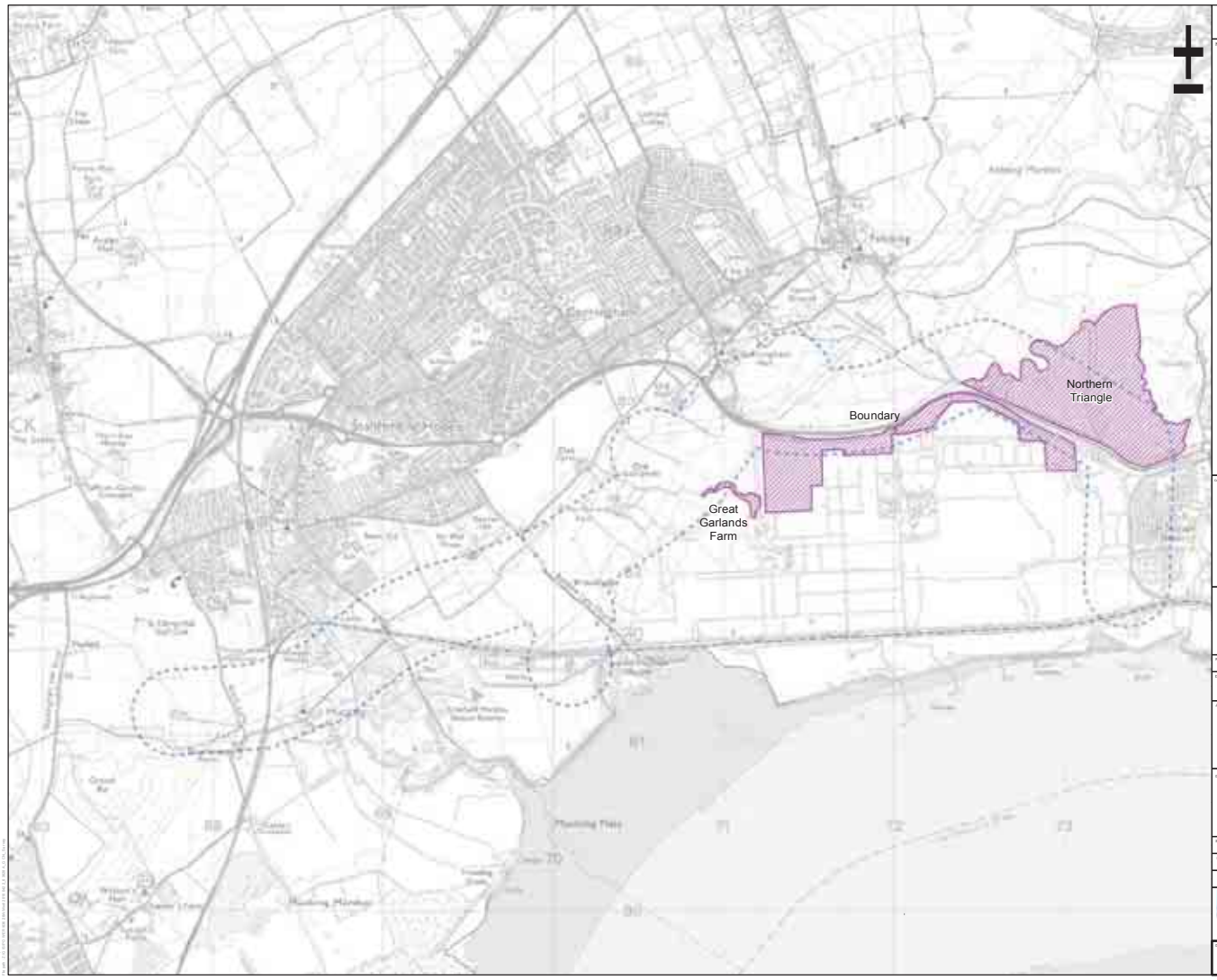
FINAL
Thames Haven
Great Crested Newt Survey Areas
PARSONS BRINCKERHOFF
St Cleres Hall Golf Club
Gravel Pit
Mucking Flats
Jetty
Fobbing Marshes

63958A_GCN_SA

FIGURE 2: LOCATION OF THE GREAT CRESTED NEWT RECEPTOR SITES WITHIN THE SURVEY AREA, DESIGNED AND IMPLEMENTED AS PART OF THE LARGER DP WORLD LG DEVELOPMENT



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Notes

Total Survey Area

Great Crested Newt Receptor Site

0 100 200 300 400 500
Metres

Revision Details	By	Date	Ap'd

Drawing Status

FINAL

Job Title

Thames Haven

Drawing Title

Great Crested Newt Receptor Sites for The DP World Development

Scale at A3	1:20,000	
Drawn	JL	Approved TM
Stage 1 check	Stage 2 check	Orig batched

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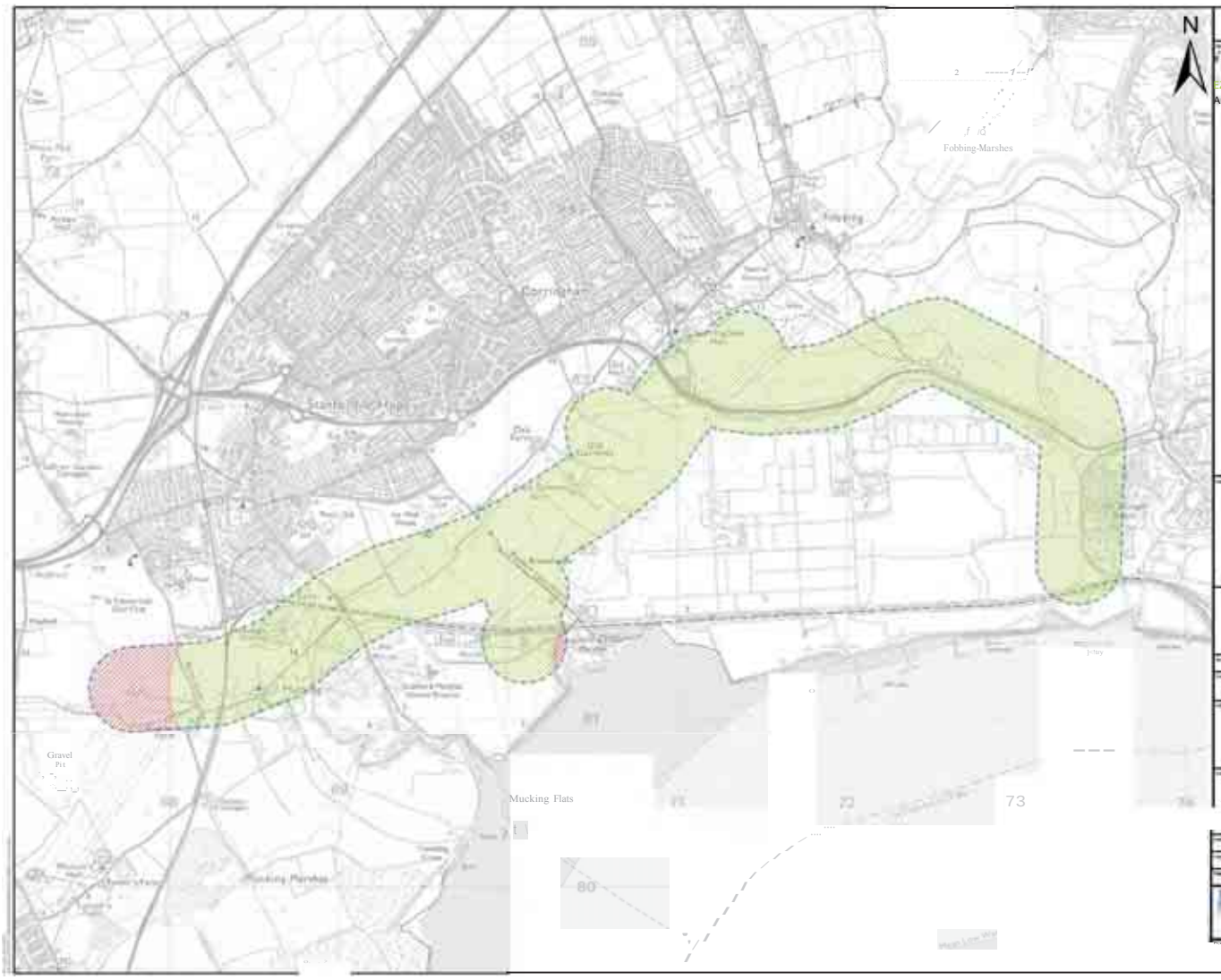
Drawing Number

63958A_GCN_RS

Rev

FIGURE 3: INDICATION OF THE LAND WITHIN THE SURVEY AREA PREVIOUSLY SURVEYED FOR GREAT CRESTED NEWTS BY THOMSON ECOLOGY IN 2008/9



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.Total Survey Area

Area Surveyedin 2008 as Part EZI of the DP \1Vorld Development Area Not Previously Surveyed

100 200 300 4JO 500
Meters

2010

FINAL

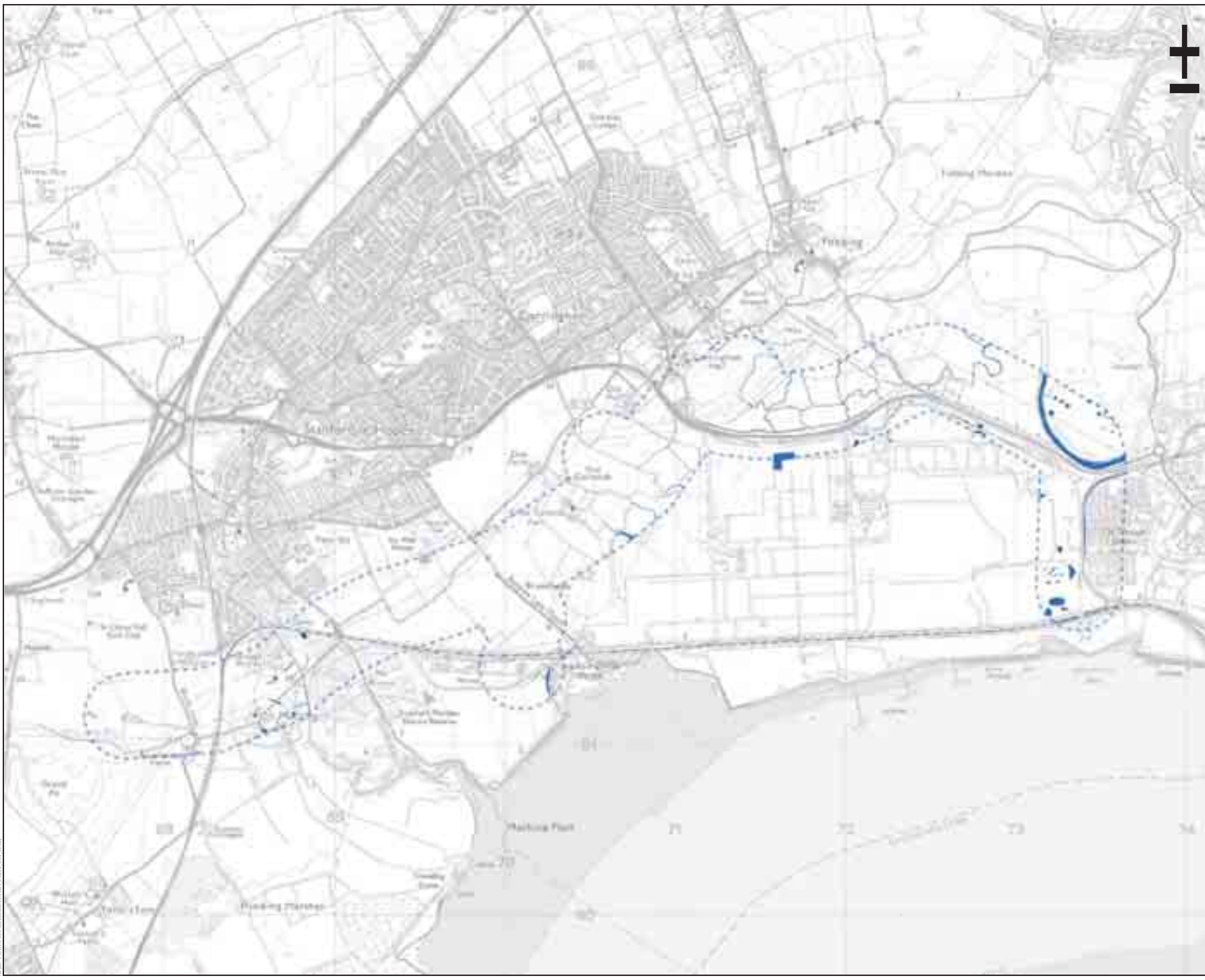
Thames Haven

Indication of Land Already Surveyedfor Great Crested Newts in 2008/09 by Thomson Ecology

PARSONS BRINCKERHOFF

63958A_GCN_EXS

FIGURE 4: LOCATION OF WATER BODIES WITHIN THE SURVEY AREA



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Notes

Total Survey Area

Waterbody

0 100 200 300 400 500
Metres

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Thames Haven

Drawing Title: Location of Waterbodies Within and Around the Survey Area

Scale at A3: 1:20,000

Drawn	JL	Approved	TM
Stage 1 check	Stage 2 check	Originated	Date 14/06/2010

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Drawing Number: 63958A_GCN_WB   Rev

FIGURE 5: WATER BODY LOCATIONS & HABITAT SUITABILITY INDEX FOR WATER BODIES WITHIN THE SURVEY AREA

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Notes

Map Sheet

0 100 200 300 400 500
Metres

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Thames Haven

Drawing Title: Alignment of Map Sheets For Great Crested Newt Report

Scale at A3	1:20,000		
Drawn	JL	Approved	TM
Stage 1 check	Stage 2 check	Originated	Date 16/06/2010

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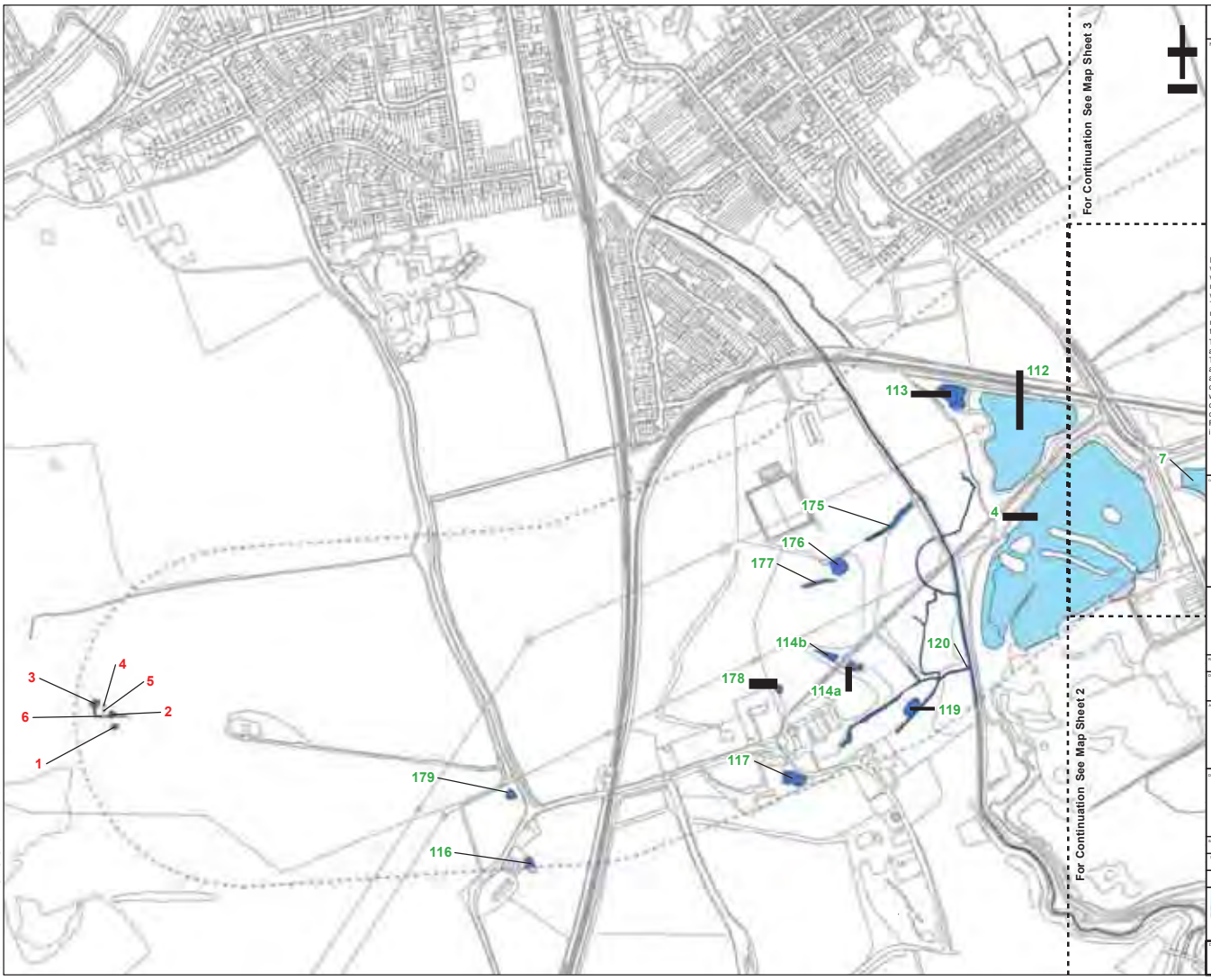
Drawing Number: 63958A_GCN_LAYOUT
Rev



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Notes

- Map Sheet
- Total Survey Area
- Waterbody Suitable For Great Crested Newts (2008)
- Waterbody Not Suitable For Great Crested Newts (2008)
- Waterbodies Occuring Outside of the Survey Area

In the 2001 and 2002 surveys waterbodies were numbered 1-127. The waterbodies were re-numbered in 2006 1-125 without reference to the previous numbering system, with some waterbodies being grouped together. This resulted in the duplication of waterbody numbers, with some waterbodies having two numbers and others having one, but sharing this with other waterbodies.

To clarify the numbering system, the numbers and colours have been left the same as in the Thomson report whereby waterbodies surveyed and identified within different years have colours as well as numbers thereby reducing the confusion of replicated numbers. To clarify all waterbodies surveyed in 2008/9 are coloured in orange, blue, and green to allow for cross-referencing with the Thomson Ecology Report. New 2010 waterbodies are represented in red.

0 50 100 150 200
Metres

Revision Details	By	Date	Ap'd

Drawing Status: FINAL

Job Title: Thames Haven

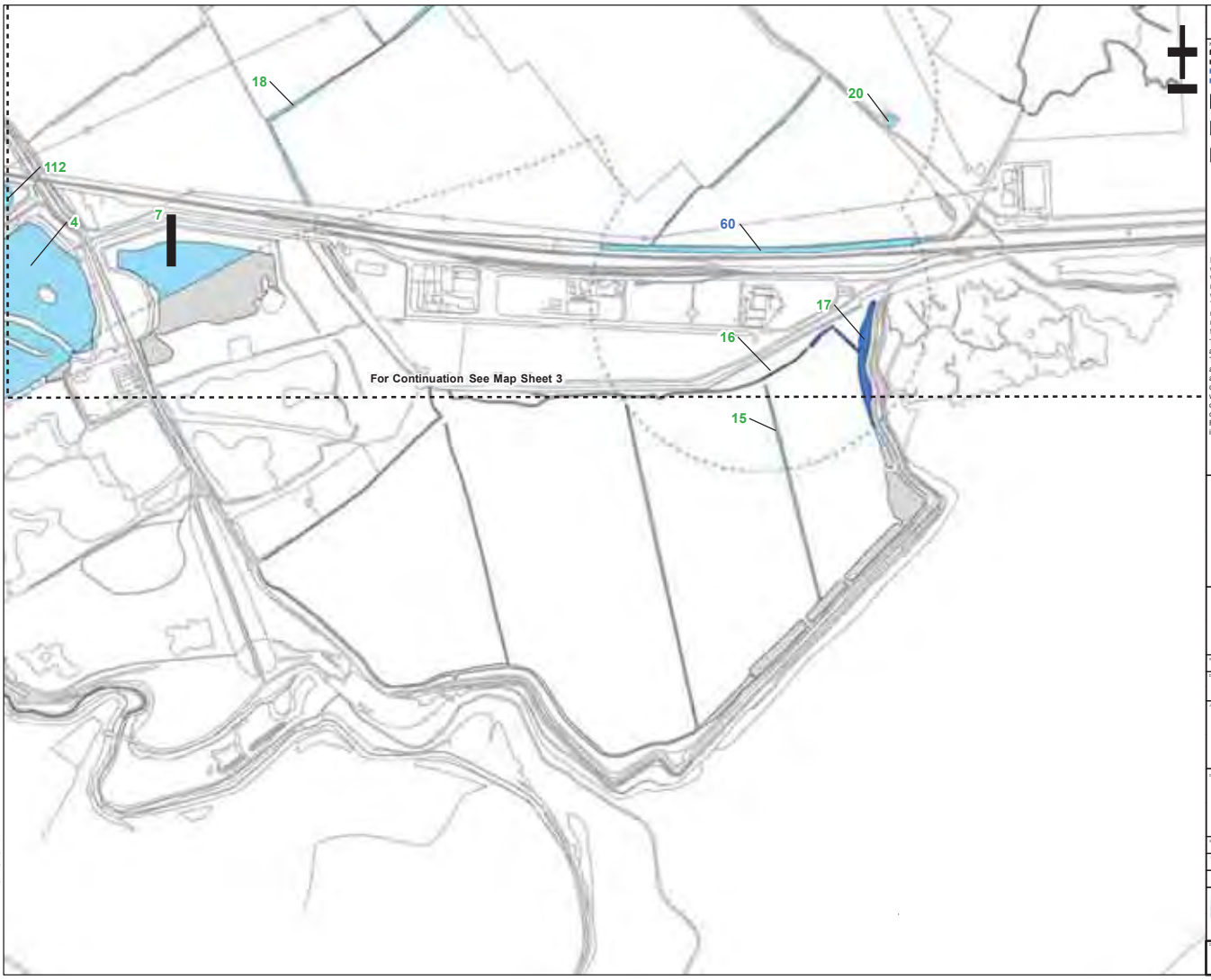
Drawing Title: Habitat Suitability Survey Results for Waterbodies Within the Survey Area (Map Sheet 1 of 7)

Scale at A3	1:5,000	
Drawn	JL	Approved TM
Stage 1 check	Stage 2 check	Orig checked

Parsons Brinckerhoff
8 Devonshire Square, London, EC2M 4PL
Tel: 020 7337 1700 Fax: 020 7337 1701

Drawing Number: 63958A_GCN_HAB_01

Rev:



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0 50 100 150 200
Metres

Revision Details	By	Date	Ap'd

Drawing Status: FINAL

Job Title: Thames Haven

Drawing Title: Habitat Suitability Survey Results for Waterbodies Within the Survey Area (Map Sheet 2 of 7)

Scale at A3: 1:5,000

Drawn	Approved
JL	TM

Stage 1 check | Stage 2 check | Orig backed | Date

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London EC2M 4PL
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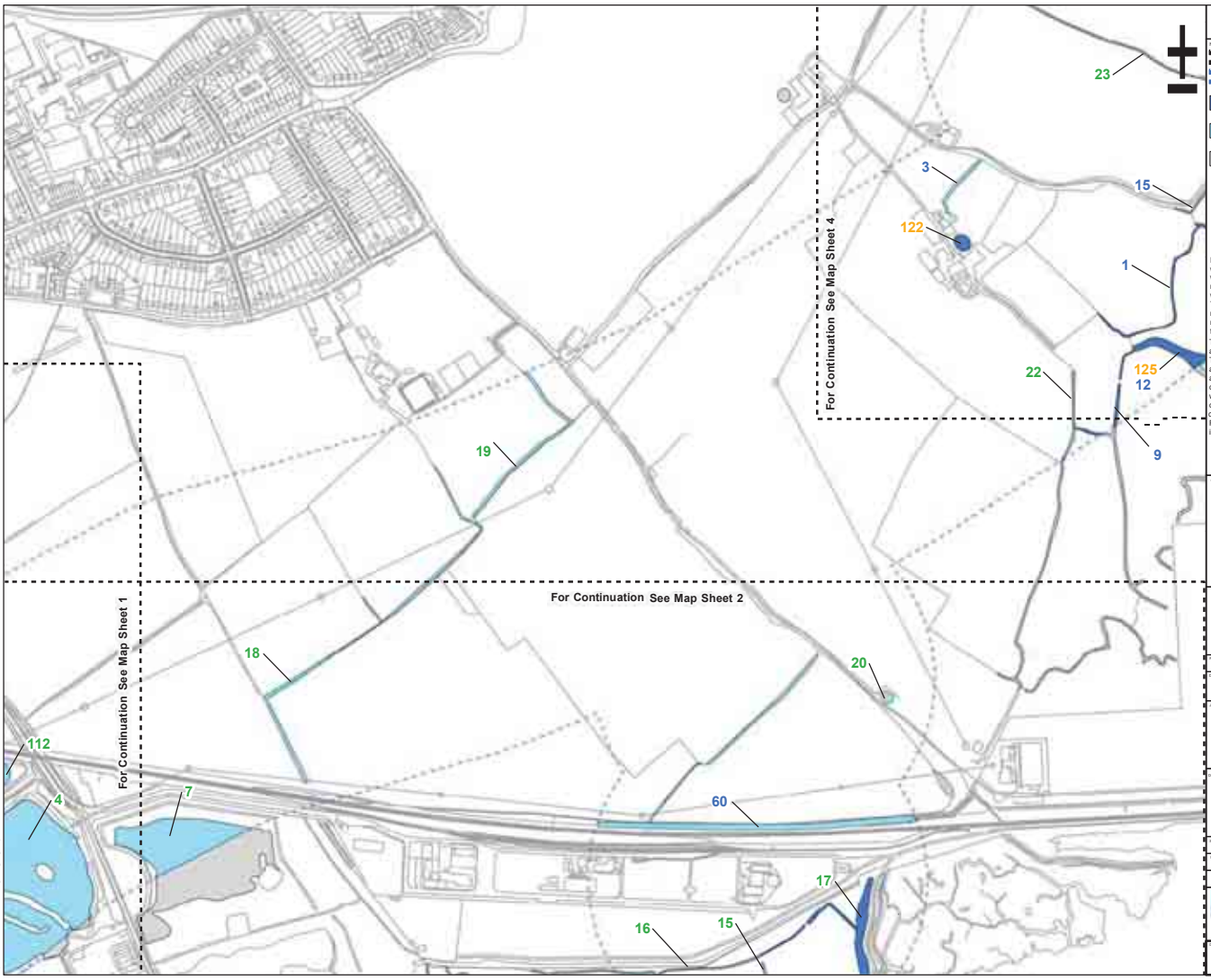
Drawing Number: 63958A_GCN_HAB_02

Rev



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Notes

Map Sheet

Total Survey Area

Waterbody Suitable For Great Crested Newts (2008)

Waterbody Not Suitable For Great Crested Newts (2008)

Waterbodies Occuring Outside of the Survey Area

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0 50 100 150 200

Metres

Revision Details | By | Date | Ap'd

Drawing Status: FINAL

Job Title: Thames Haven

Drawing Title: Habitat Suitability Survey Results for Waterbodies Within the Survey Area (Map Sheet 3 of 7)

Scale at A3: 1:5,000

Drawn: JL | Approved: TM

Stage 1 check | Stage 2 check | Orig checked | Date: 19/03/2010

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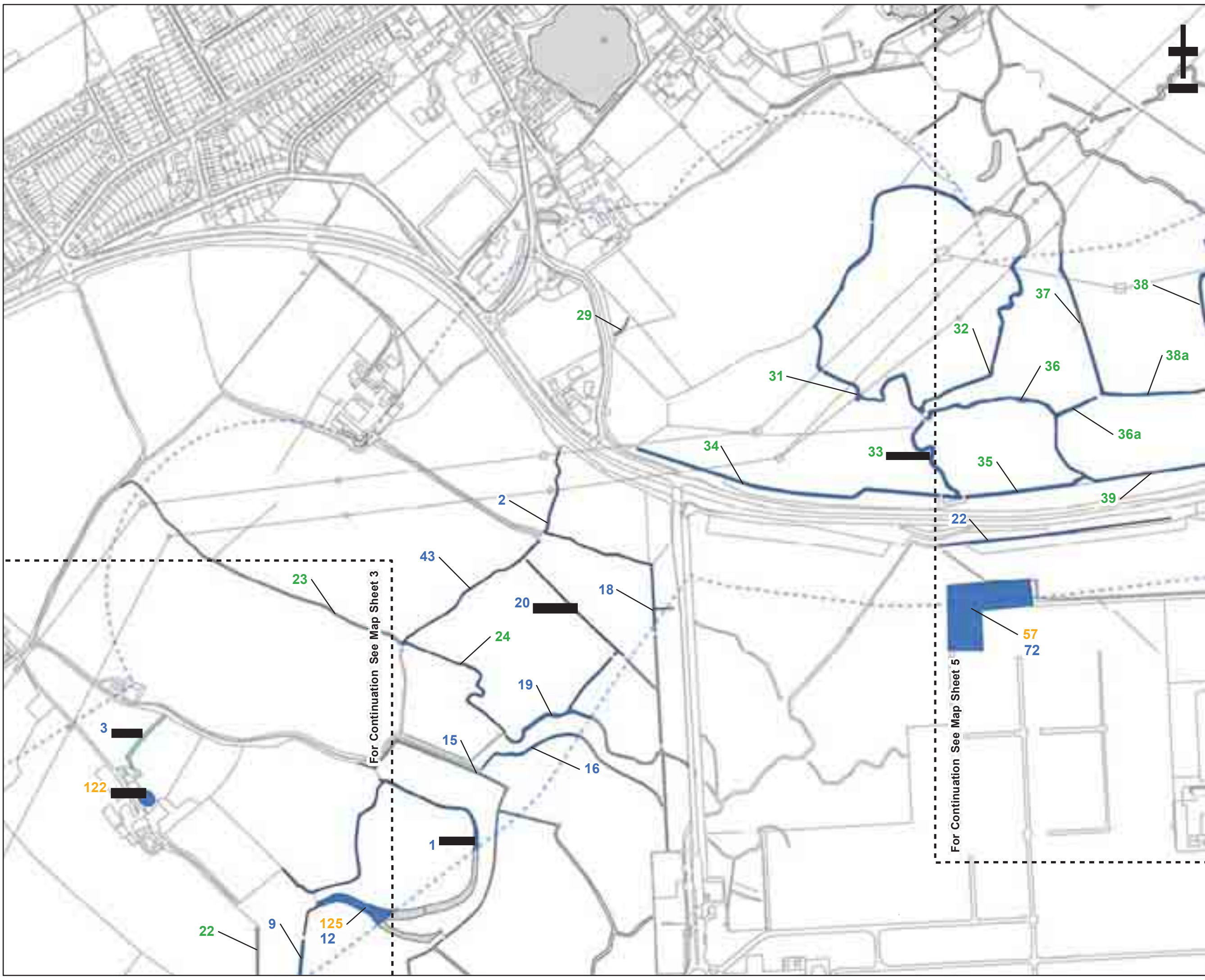
Drawing Num'ber: 63958A_GCN_HAB_03

Rev:



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Notes

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- Total Survey Area
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- Waterbody Not Suitable For Great Crested Newts (2008)
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0 50 100 150 200
Metres

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Thames Haven

Drawing Title: Habitat Suitability Survey Results for Waterbodies Within the Survey Area (Map Sheet 4 of 7)

Scale at A3: 1:5,000

Drawn	JL	Approved	TM
Stage 1 check	Stage 2 check	Originated	Date 16/06/2010

PARSONS BRINCKERHOFF
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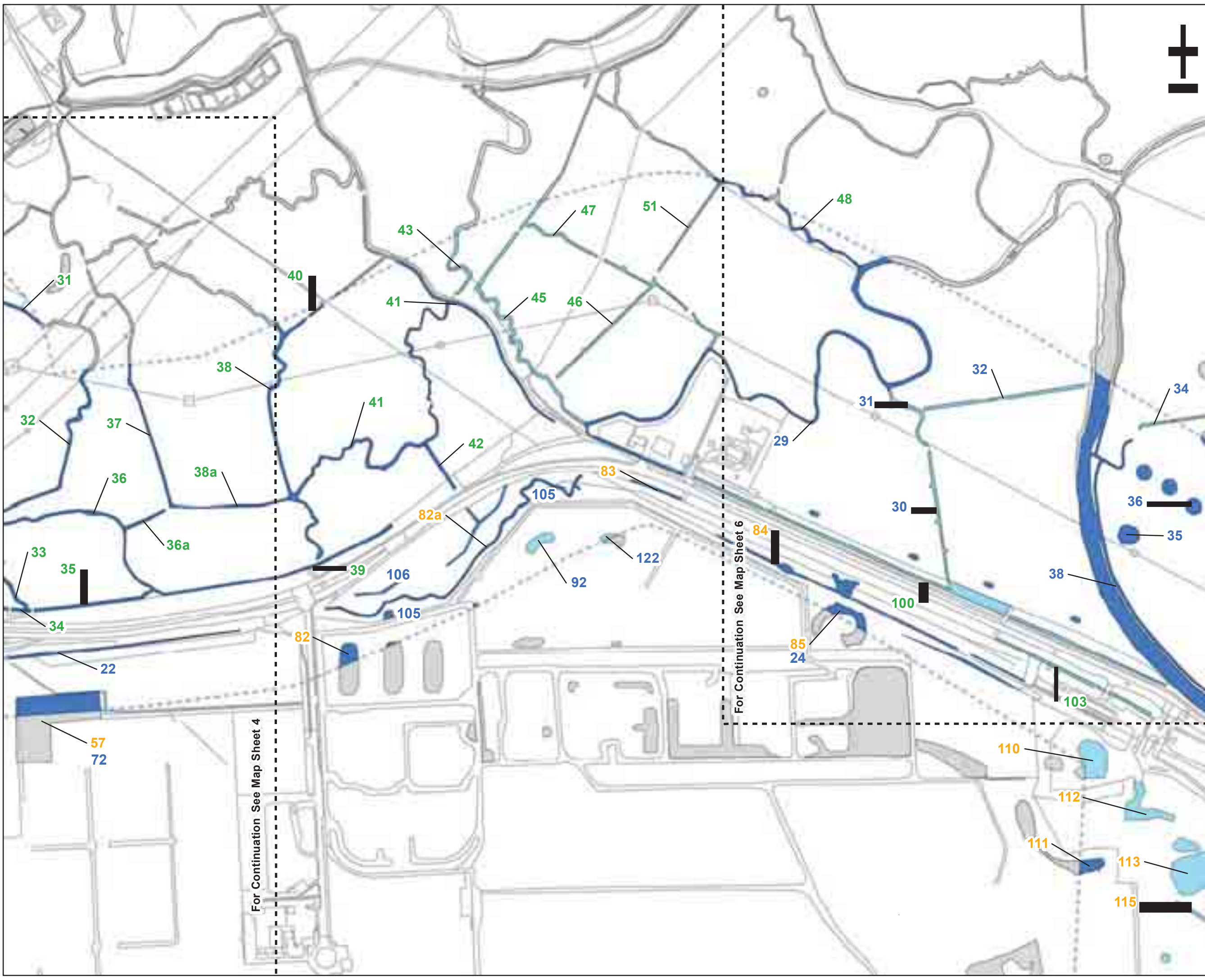
London, EC2M 4YE
Tel: 020 7337 1700 Fax: 020 7337 1701

Drawing Number: 63958A_GCN_HAB_04
Rev



Notes

- Map Sheet
- Total Survey Area
- Waterbody Suitable for Great Crested Newts
- Waterbody Not Suitable for Great Crested Newts
- Waterbody Outside the Survey Area

The waterbodies were colour coded and numbered (1-125) in 2006 by Thomson Ecology, depending on when they were surveyed and by whom.This system has been adopted to allow different reports to be compared. Orange, blue and green refer to 2008/09 surveys and red to 2010 surveys.

0 50 100 150 200
Metres

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Thames Haven

Drawing Title: Habitat Suitability Survey Results (Map Sheet 5 of 7)

Scale at A3	1:5,000		
Drawn	JL	Approved	TM
Stage 1 check	Stage 2 check	Originated	Date 16/06/2010

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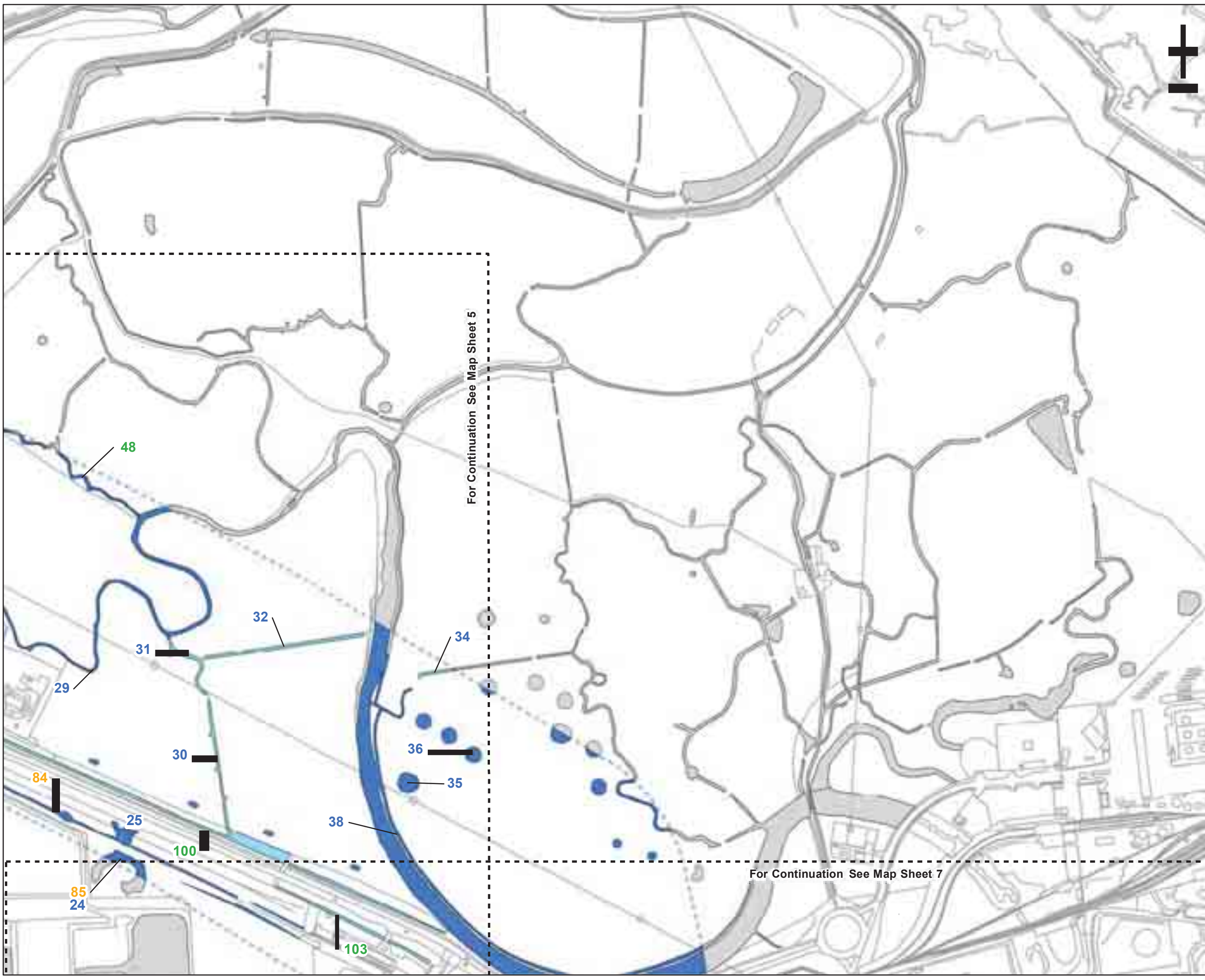
6 Devonshire Square, London, EC2M 4YE
Tel: 020 7337 1700 Fax: 020 7337 1701

Drawing Number: 63958A_GCN_HAB_05 Rev



Notes

- Map Sheet
- Total Survey Area
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- Waterbody Not Suitable For Great Crested Newts (2008)
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0 50 100 150 200
Metres

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Thames Haven

Drawing Title: Habitat Suitability Survey Results for Waterbodies Within the Survey Area (Map Sheet 6 of 7)

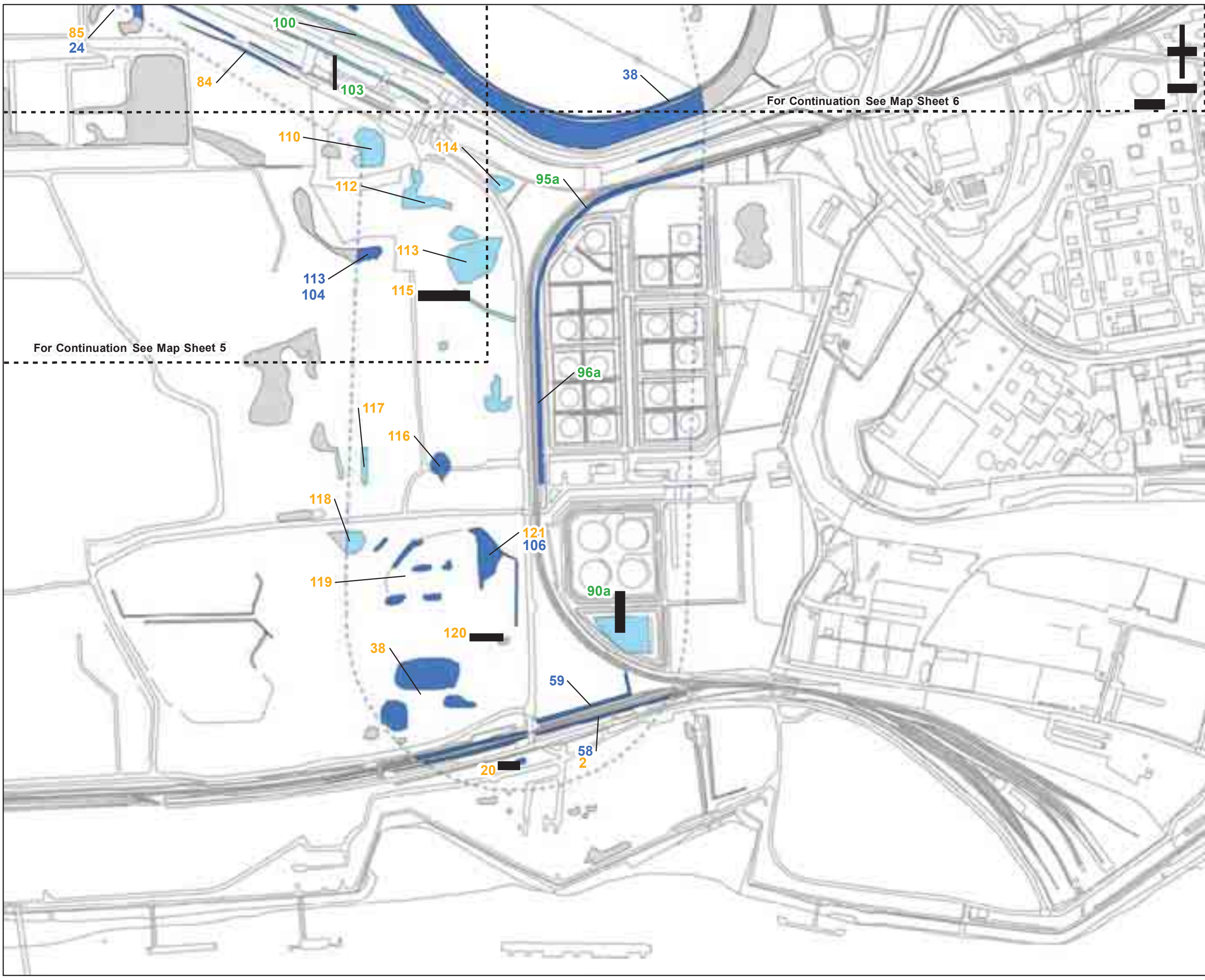
Scale at A3: 1:5,000

Drawn: JL | Approved: TM

Stage 1 check | Stage 2 check | Originated | Date 16/06/2010

PARSONS BRINCKERHOFF
6 Devonshire Square,
London, EC2M 4YE
Tel: 020 7337 1700 Fax: 020 7337 1701

Drawing Number: 63958A_GCN_HAB_06 Rev



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Notes

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- Total Survey Area
- Waterbody Suitable for Great Crested Newts
- Waterbody Not Suitable for Great Crested Newts
- Waterbody Outside the Survey Area

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0 50 100 150 200
Metres

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Thames Haven

Drawing Title: Habitat Suitability Survey Results (Map Sheet 7 of 7)

Scale at A3: 1:5,000

Drawn	JL	Approved	TM
Stage 1 check	Stage 2 check	Originated	Date 16/06/2010

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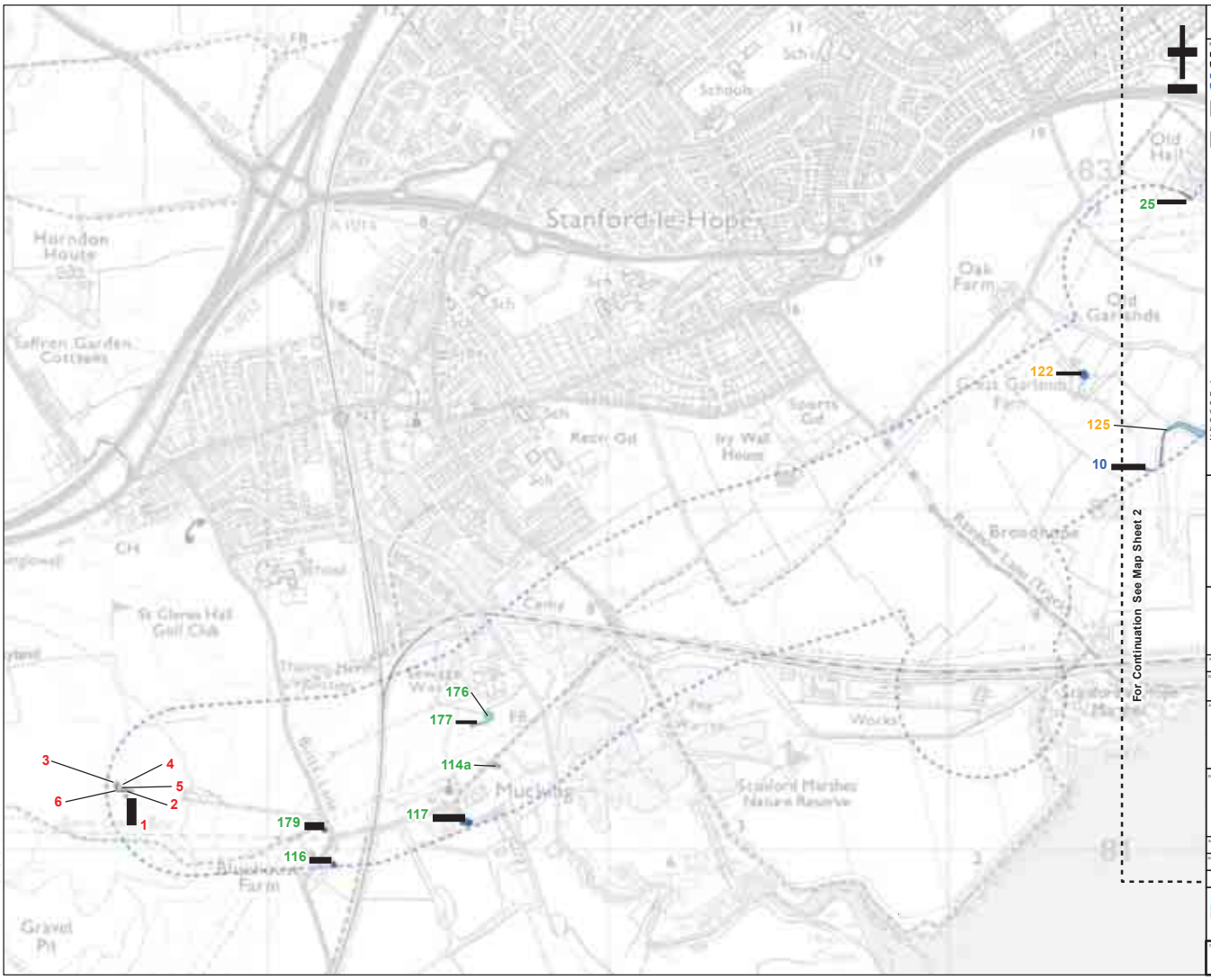
Drawing Number: 63958A_GCN_HAB_07 Rev

FIGURE 6: POPULATION SITE ESTIMATES OF GCN ACROSS THE SURVEY AREA



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Notes

- Map Sheet
- Total Survey Area
- Medium Great Crested Newt Population
- Small Great Crested Newt Population

The waterbodies were colour coded and numbered (1-125) in 2006 by Thomson Ecology, depending on when they were surveyed and by whom.This system has been adopted to allow different reports to be compared. Orange, blue and green refer to 2008/09 surveys and red to 2010 surveys.

0 50 100 150 200 250
Metres

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0100031673 2010

Revision Details	By	Date	Auth

Drawing Status: FINAL

Job Title: Thames Haven

Drawing Title: Estimation of Great Crested Newt Population Sizes (Map Sheet 1 of 2)

Scale at A3: 1:10,000

Drawn	As prior ref
JL	TM

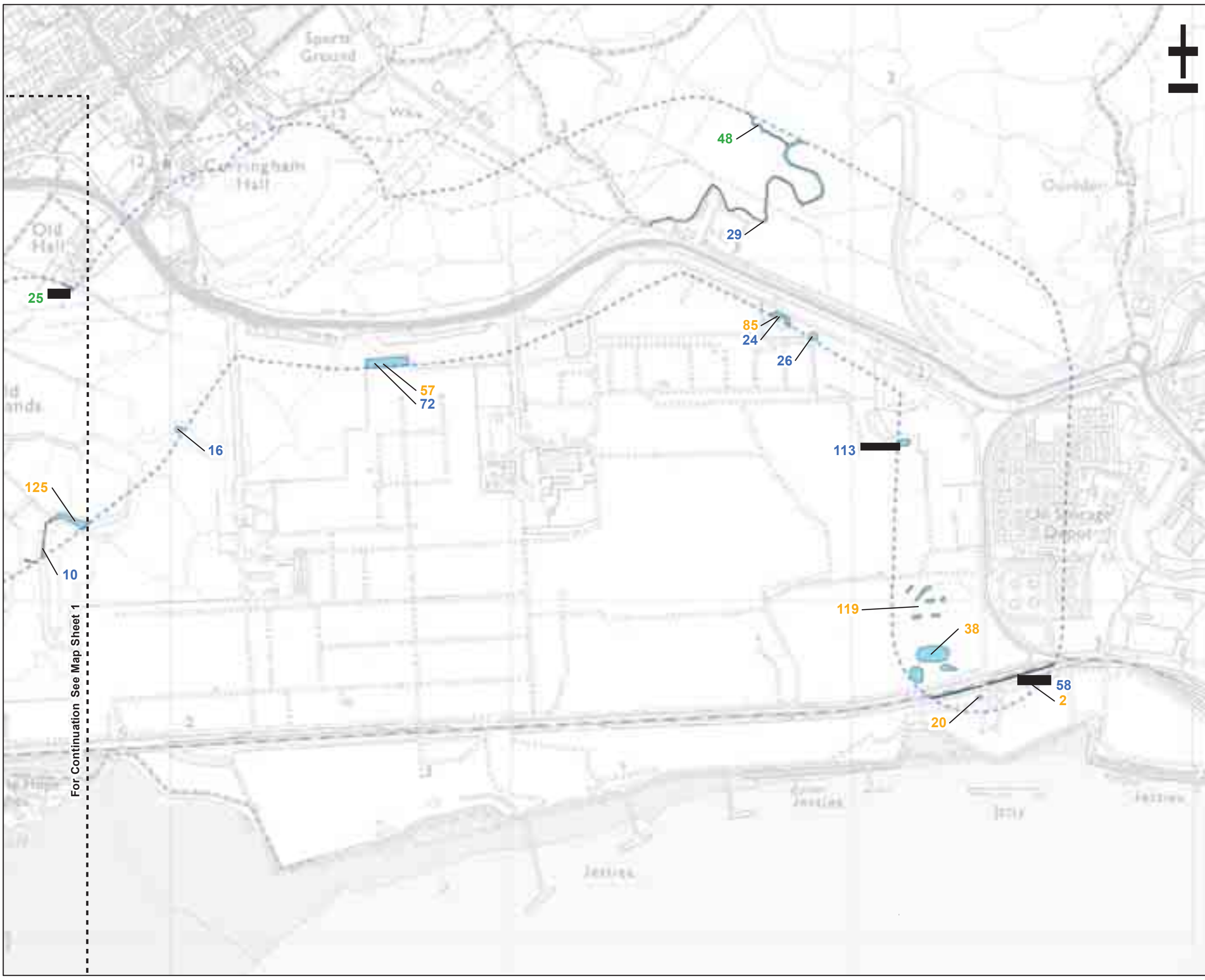
Stage 1 check	Stage 2 check	Org check	Date

PARSONS BRINCKERHOFF

6 Devonshire Square
London EC2M 4YE
Tel: 020 7337 1700 Fax: 020 7337 0101

Drawing Num ber: 63958A_GCN_POP_01

Rev:



Notes

- Map Sheet
- Total Survey Area
- Medium Great Crested Newt Population
- Small Great Crested Newt Population

The waterbodies were colour coded and numbered (1-125) in 2006 by Thomson Ecology, depending on when they were surveyed and by whom.This system has been adopted to allow different reports to be compared. Orange, blue and green refer to 2008/09 surveys and red to 2010 surveys.

0 50 100 150 200 250
Metres

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Thames Haven

Drawing Title: Estimation of Great Crested Newt Population Sizes (Map Sheet 2 of 2)

Scale at A3: 1:10,000

Drawn	JL	Approved	TM
Stage 1 check	Stage 2 check	Originated	Date 16/06/2010

6 Devonshire Square,
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Tel: 020 7337 1700 Fax: 020 7337 1701

Drawing Number: 63958A_GCN_POP_02
Rev

RAW DATA

RAW DATA 1: GREAT CRESTED NEWT HABITAT SUITABILITY RESULTS FOR THE 2010 SURVEYS COMPLETED BY PARSONS BRINCKERHOFF

Gateway Energy Centre CCGT Gas Pipeline and Electricity Cabling Routes						
Date	30/04/2010					
Surveyors	TM & JB					
SI Factor	**Ditch**	**Pond 1**	**Pond 2**	**Pond 3**	**Pond 4**	**Pond 5**
	Score					
1	1	1	1	1	1	1
2	0.256	0.05	0.05	0.34	0.05	0.05
3	0.9	0.9	0.9	0.9	0.5	0.5
4	0.67	0.67	0.67	0.67	0.33	0.33
5	1	1	1	1	1	1
6	1	1	1	1	1	1
7	1	1	1	1	1	1
8	0.67	0.67	0.67	0.67	0.67	0.67
9	1	1	1	1	1	1
10	1	0.4	0.5	0.6	1	1
HSI	0.797	0.618	0.632	0.779	0.595	0.595

RAW DATA 2: GREAT CRESTED NEWT SURVEY RESULTS FOR THE 2010 SURVEYS COMPLETED BY PARSONS BRINCKERHOFF

Date of Survey (2010)	Pond no.	Methods Used				Results						Comments
		Torch	Bottle	Net	Egg	GCN		Smooth		Palmate		**Note: It is difficult to distinguish between smooth and palmate newts during torch surveys (see Paragraph 3.2.16).**
						M	F	M	F	M	F	
Survey Visit 1:												
29th – 30th April	1			-	-	-	2	9	-	-	-	1 juvenile GCN recorded. 5 adult female smooth or palmate newts recorded during torch survey
	2			-	-	2	2	5	3	-	-	10 adult female smooth or palmate newts recorded during torch survey. 2 juvenile smooth or palmate newts recorded during torch survey
	3			-	-	1	6	12	3	-	-	12 adult female smooth or palmate newts recorded during torch survey. 10 adult smooth or palmate newts recorded during torch survey.
	4			-	-	**-**	**1**	-	1	-	-	Visibility is poor due to blanket weed.
	5			-	-	-	-	-	-	-	-	
	Ditch			-	-	3	2	2	3	-	-	2 adult female smooth or palmate newts recorded during

Date of Survey (2010)	Pond no.	Methods Used				Results						Comments
		Torch	Bottle	Net	Egg	GCN		Smooth		Palmate		**Note: It is difficult to distinguish between smooth and palmate newts during torch surveys (see Paragraph 3.2.16).**
						M	F	M	F	M	F	
												torch survey
Survey Visit 2:												
13th – 14th May	1			-	-	1	-	9	3	-	-	6 adult female smooth or palmate newts recorded during torch survey
	2			-	-	2	1	7	3	-	-	11 adult female smooth or palmate newts recorded during torch survey
	3			-	-	1	-	2	1	-	-	13 adult female smooth or palmate newts recorded during torch survey
	4			-	-	-	-	-	-	-	-	
	5			-	-	-	-	-	-	-	-	
	Ditch			-	-	1	1	6	2	-	-	1 adult female smooth or palmate newt recorded during torch survey
Survey Visit 3:												
17th – 18th May	1			-	-	4	2	4	-	-	-	4 adult female smooth or palmate newts recorded during torch survey
	2			-	-	-	-	8	1	-	-	7 adult female smooth or palmate newts recorded during torch survey

Date of Survey (2010)	Pond no.	Methods Used				Results						Comments
		Torch	Bottle	Net	Egg	GCN		Smooth		Palmate		**Note: It is difficult to distinguish between smooth and palmate newts during torch surveys (see Paragraph 3.2.16).**
						M	F	M	F	M	F	
	3			-	-	2	2	12	3	-	-	2 adult female smooth or palmate newts recorded during torch survey
	4			-	-	-	-	3	1	-	-	1 adult female smooth or palmate newt recorded during torch survey
	5			-	-	-	-	2	1	-	-	
	Ditch			-	-	-	4	5	2			7 adult female smooth or palmate newts recorded during torch survey. 1 juvenile smooth or palmate newt recorded during torch survey.
Survey Visit 4:												
20th – 21st May	1			-	-	-	1	9	2	-	-	5 adult female smooth or palmate newts recorded during torch survey. 4 unknown newts were recorded during the torching survey.
	2			-	-	-	2	4	3	-	-	5 adult female smooth or palmate newts recorded during torch survey.
	3			-	-	1	-	9	1	-	-	4 unknown newts were recorded during the torching

Date of Survey (2010)	Pond no.	Methods Used				Results						Comments
		Torch	Bottle	Net	Egg	GCN		Smooth		Palmate		**Note: It is difficult to distinguish between smooth and palmate newts during torch surveys (see Paragraph 3.2.16).**
						M	F	M	F	M	F	
												survey. 1 adult female smooth or palmate newt recorded during torch survey.
	4			-	-	-	-	4	2	-	-	
	5			-	-	-	1	-	-	-	-	1 adult female smooth or palmate newt recorded during torch survey.
	Ditch			-	-	1	1	5	1	-	-	2 adult female smooth or palmate newts recorded during torch survey.
Survey Visit 5:												
25th -26th May	1			-	-	1	2	1	-	-	-	2 adult female smooth or palmate newts recorded during torch survey. 1 juvenile smooth or palmate newt recorded during torch survey.
	2			-	-	1	-	4	2	-	-	4 adult female smooth or palmate newts recorded during torch survey.
	3			-	-	-	2	3	-	-	-	1 adult female smooth or palmate newt recorded during torch survey. 6 unknown newts were recorded during the torching

Date of Survey (2010)	Pond no.	Methods Used				Results						Comments
		Torch	Bottle	Net	Egg	GCN		Smooth		Palmate		Note: It is difficult to distinguish between smooth and palmate newts during torch surveys (see Paragraph 3.2.16).
						M	F	M	F	M	F	
												survey.
	4			-	-	-	**3**	-	1	-	-	2 adult female smooth or palmate newts recorded during torch survey.
	5			-	-	-	2	2	-	-	-	3 adult female smooth or palmate newts recorded during torch survey. 3 newt larva recorded during the bottle trap surveys.
	Ditch			-	-	4	4	-	3	-	-	3 adult female smooth or palmate newts recorded during torch survey.
Survey Visit 6:												
03rd – 04th May	1			-	-	1	1	3	-	-	-	3 adult female smooth or palmate newts recorded during torch survey. 1 juvenile smooth or palmate newt recorded during torch survey. 2 newt larva recorded during the bottle trap surveys.
	2			-	-	1	5	5	6	-	-	4 adult female smooth or palmate newts recorded during torch survey. 3 newt larva recorded during

Date of Survey (2010)	Pond no.	Methods Used				Results						Comments
		Torch	Bottle	Net	Egg	GCN		Smooth		Palmate		**Note: It is difficult to distinguish between smooth and palmate newts during torch surveys (see Paragraph 3.2.16).**
						M	F	M	F	M	F	
												the bottle trap surveys.
	3			-	-	1	3	9	-	-	-	2 adult female smooth or palmate newts recorded during torch survey. 10 newt larva recorded during the bottle trap surveys.
	4			-	-	-	**3**	-	4	-	-	2 adult female smooth or palmate newts recorded during torch survey.
	5			-	-	-	2	2	-	-	-	3 adult female smooth or palmate newts recorded during torch survey. 3 newt larva recorded during the bottle trap surveys.
	Ditch			-	-	4	4	-	3	-	-	3 adult female smooth or palmate newts recorded during torch survey.

RAW DATA 3: GREAT CRESTED NEWT HABITAT SUITABILITY INDEX RESULTS & SURVEY RESULTS FOR THE 2008/9 SURVEYS COMPLETED BY THOMSON ECOLOGY

Waterbody Number	Brief Description	HIS Score	HSI Suitability	Suitable for Breeding GCN	Presence / Absence	Peak Count	Population Class
Orange 2/ Blue 58, 61	Ditch running alongside railway, very overgrown and dry in places	0.75	Good	Yes	Present	20	Medium
Orange 20	Gravel based, adjacent to road. Grasses present	0.62	Average	yes	Present	1	Small
Orange 38	Pond and ditch	0.58	Below Averag	Yes	Present	3	Small
Orange 57 / Blue 72	Steep banks, completely dominated by *Phragmities.*	0.81	Excellent	Yes	Present	4	Small
Orange 82 / Blue 89, 90	three large ponds with slight banks, joined together by a ditch.	0.8	Excellent	Yes	Absent	*	*
Orange 82a	Small pond in area of short grass	0.74	Good	Yes	Absent	*	*
Orange 83	Shallow ditch along main road	0.62	Average	Yes	Absent	*	*
Orange 84 / Blue 25	Pond and ditch	0.92	Excellent	Yes	Absent	*	*
Orange 85 / Blue 24	Wide ditch in field of cut grass, flooded over banks.	0.82	Excellent	Yes	Present	6	Small
Orange 110	No longer present, just grassy field	*	DRY	No	*	*	*
Orange 111/Blue 104	Lake	0.76	Excellent	Yes	Absent	*	*
Orange 112	Dry	*	DRY	No	*	*	*
Orange 113	Marshy Flooded area	0.59	Average	No	*	*	*

Orange 114	Dry	*	DRY	No	*	*	*
Orange 115	Dry	*	DRY	No	*	*	*
Orange 116	Flooded pool	0.79	Good	Yes			
Orange 117	Ditch	*	DRY	No	*	*	*
Orange 119	Area of standing water, comprising of three waterbodies, two of which are seasonally wet, the third being a deeper ditch.	0.54	Below Average	Yes	Present	1	Small
Orange 120	Dry	*	DRY	No	*	*	*
Orange 121 / Blue 106	Deep ditch, with good vegetation for egg laying.	0.83	Excellent	Yes	Absent	*	*
Orange 122 /Blue 12	Pond by farm house, in need of management	0.58	Below Average	Yes	Present	23	Medium
Orange 125/Blue12	Wide field boundary ditch may dry a little in the summer.	0.68	Good	Yes	Present	1	Small
Blue 1	Wide field boundary ditch may dry a little in the summer.	0.64	Good	Yes	Absent	*	*
Blue 2	Wide field boundary ditch may dry a little in the summer.	0.59	Below Average	Yes	Absent	*	*
Blue 3	Does not exist anymore	*	DRY	No	*	*	*
Blue 9 / 10	Field boundary ditch	0.54	Below Average	Yes	Present	2	Small
Blue 15	Alongside track, mainly reeds	*	DRY	No	*	*	*
Blue 16	Wide field boundary ditch may dry a little in the summer.	0.64	Average	Yes	Present	1	Small

Blue 18	Wide field boundary ditch may dry a little in the summer.	0.63	Average	Yes	Absent	*	*
Blue 19	Wide field boundary ditch may dry a little in the summer.	0.6	Average	Yes	Absent	*	*
Blue 20	Wide field boundary ditch may dry a little in the summer.	0.74	Good	Yes	Absent	*	*
Blue 21	Wide field boundary ditch may dry a little in the summer.	0.93	Excellent	Yes	Absent	*	*
Blue 22	Ditch along main road	0.78	Excellent	Yes	Absent	*	*
Blue 23	Dry	*	DRY	No	*	*	*
Blue 26	Ditch alongside road, ditch with steep banks	0.74	Good	Yes	Present	3	Small
Blue 29	Wide ditch in pasture, no flow apparent, dominated by reeds	0.76	Good	Yes	Present	1	Small
Blue 30	Essentiallya dry ditch in pasture fields	*	DRY	No	*	*	*
Blue 31	Essentiallya dry ditch in pasture fields	*	DRY	No	*	*	*
Blue 32	Ditch in pasture field	*	DRY	No	*	*	*
Blue 34	Ditch in pasture field	*	DRY	No	*	*	*
Blue 35	Pond in pasture field	*	DRY	No	*	*	*
Blue 36	Pond in pasture field, churned up, with many waterfowl present	0.35	Poor	No	*	*	*
Blue 37	Ditch	*	DRY	No	*	*	*
Blue 38	Ditch in pasture field	0.53	Below Average	No	*	*	*

Blue 43	Ditch along field boundary, tree lined, may dry out in places	0.76	Good	Yes	Absent	*	*
Blue 59	Wide ditch running alongside the railway line	0.84	Excellent	yes	Absent	*	*
Blue 60	Shallow ditch	*	DRY	No	*	*	*
Blue 91	Dry	*	DRY	No	*	*	*
Blue 92	Dry	*	DRY	No	*	*	*
Blue 93	Dry	*	DRY	No	*	*	*
Blue 105	Considered to be part of Orange 82a	0.74	Good	Yes	Present	2	Small
Blue 106	Considered to be part of Orange 82a	0.74	Good	Yes	Present	2	Small
Blue 113	Only a small 'pond' area remains	0.67	Average	Yes	Present	1	Small
Blue 122	Small area of seasonal flooding on field	0.46	Poor	No	*	*	*
Green 4	Angling lake, stocked with fish	*	Unsuitable	No	*	*	*
Green 5	Angling lake, stocked with fish	*	Unsuitable	No	*	*	*
Green 6	Angling lake, stocked with fish	*	Unsuitable	No	*	*	*
Green 7	Angling lake, stocked with fish	*	Unsuitable	No	*	*	*
Green 15	Ditch and puddles, essentially dry	*	Dry	*	*	*	*
Green 16	Ditch	*	Dry	*	*	*	*
Green 17	Ditch alongside arable field, dry along muchof length	0.75	Good	Yes	Absent	*	*
Green 18	Ditch	*	Dry	*	*	*	*
Green 19	Ditch, ploughed over at one end	*	Dry	*	*	*	*
Green 20	Pond, grassed over. Succeeded	*	Dry	*	*	*	*

Green 21	Ditch	*	Dry	*	*	*	*
Green 22	Ditch	*	Dry	*	*	*	*
Green 23	Flowing stream contaminated with pollution and rubbish	*	Unsuitable	No	*	*	*
Green 24	Winding ditch connected to green 23 -Dense reeds in patches	0.6	Below Average	Yes	Absent	*	*
Green 25	Pond next to Old Hall Farm, house pond surrounded by grass	0.63	Average	Yes	Present	1	Small
Green 29	Ditch, overgrown	*	Dry	*	*	*	*
Green 31	Ditches around field, short pasture	0.74	Good	Yes	Absent	*	*
Green 32	Ditches around field, short pasture	0.74	Good	Yes	Absent	*	
Green 33	Shorth ditch, field boundary short pasture	0.7	Good	Yes	Absent	*	*
Green 34	Ditch between field and road	0.72	Good	Yes	Absent	*	*
Green 35	Ditch between field and road (is connected with Green 39)	0.75	Good	Yes	Absent	*	*
Green 36	Pasture field boundary ditch	0.82	Excellent	Yes	Absent	*	*
Green 36a	Field boundary ditch, reed at margins	0.59	Below Average	Yes	Absent	*	*
Green 37	Field boundary ditch, reeds at margins. Scrub at southern end	0.83	Excellent	Yes	Absent	*	*
Green 38	Pasture field boundary ditch	0.83	Excellent	Yes	Absent	*	*
Green 38a	Pasture field boundary ditch	0.76	Good	Yes	Absent	*	*
Green 39	Pasture field boundary ditch	0.89	Excellent	Yes	Absent	*	*

Green 40	Ditch in grazed pasture field	0.75	Good	Yes	Absent	*	*
Green 41	Long field boundary ditch	0.82	Excellent	Yes	Absent	*	*
Green 42	Ditch between arable field and pasture field	0.64	Average	Yes	Absent	*	*
Green 43	Ditch	*	DRY	No	*	*	*
Green 45	Essentially dry ditch	*	DRY	No	*	*	*
Green 46	Ditch	*	DRY	No	*	*	*
Green 47	Ditch	*	DRY	No	*	*	*
Green 48	Ditch in pasture field	0.72	Good	Yes	Present	1	Small
Green 90	Narrow concrete channel, very shallow water, no vegetation - completely unsuitable	*	Unsuitable	No	*	*	*
Green 90a	Deppresion dry	*	DRY	No	*	*	*
Green 91	Ditch, mainly dry, some puddles of oil in places	*	DRY	No	*	*	*
Green 95	Ditch surrounded by grassland, some reeds and overhanging grass	0.74	Good	Yes	Absent	*	*
Green 95a	Ditch surrounded by grassland, connected to Green 95	0.63	Average	Yes	No Data	No Data	No Data
Green 96	Narrow concrete channel, very shallow water, no vegetation - completely unsuitable	*	Unsuitable	No	*	*	*
Green 96a	Ditch with overhanging vegetation	0.63	Average	Yes	Absent	*	*
Green 100	Essentially dry ditch	*	DRY	No	*	*	*
Green 103	Dry ditch, fully succeeded	*	DRY	No	*	*	*

Green 112	Angling lake, stocked with fish	*	Unsuitable	No	*	*	*
Green 113	A disused fishing lake, with the possibility of being stocked with fish	0.89	Excellent	Yes	Probably Absent	*	*
Green 114a	A small pond within a nature reserve	0.88	Excellent	Yes	Present	2	Small
Green 114b	A small pond within a nature reserve	0.88	Excellent	Yes	Probably Absent	*	*
Green 116	A pond within a deserted farm covered in *Typha, Pragmities*and *Lemnaceae*	0.77	Good	Yes	Present	12	Medium
Green 117	A large pond with a depth of 1m	0.79	Good	Yes	Present	18	Medium
Green 119	No Data	No Data	No Data	No Data	Probably Absent	*	*
Green 120	A large flowing stream with tributaries along	0.83	Excellent	Yes	Probably Absent	*	*
Green 175	A small ditch adjacent to pond 120	0.8	Excellent	Yes	Probably Absent	*	*
Green 176	A small pond, 3m in diameter with a depth of 0.5m	0.74	Good	Yes	Present	4	Small
Green 177	A small ditch, 1.5m length and 0.5m depth	0.8	Excellent	Yes	Present	8	Small
Green 178	A small pond , 4m in diameter. Very shallow with a maz depth of 5m and densely vegetated	0.8	Excellent	Yes	Probably Absent	*	*
Green 179	A wide 8m by 2m pond with a depth of approximately 1m	0.76	Good	Yes	Present	15	Medium

2010 Habitat Suitability Survey Results

Gateway Energy Centre CCGT Gas Pipeline and Electricity Cabling Routes
Date 30/04/2010
Surveyors TM & JB

Factor	Ditch	Pond 1	Pond 2	Pond 3	Pond 4	Pond 5
	Score					
1	1	1	1	1	1	1
2	0.256	0.05	0.05	0.34	0.05	0.05
3	0.9	0.9	0.9	0.9	0.5	0.5
4	0.67	0.67	0.67	0.67	0.33	0.33
5	1	1	1	1	1	1
6	1	1	1	1	1	1
7	1	1	1	1	1	1
8	0.67	0.67	0.67	0.67	0.67	0.67
9	1	1	1	1	1	1
10	1	0.4	0.5	0.6	1	1
HSI	0.797	0.618	0.632	0.779	0.595	0.595

F.7 Phase II Breeding Bird Survey Report

Phase II Breeding Bird Report: Gateway Energy Centre Gas and Grid Connection Routes

InterGen

January 2011

PARSONS BRINCKERHOFF

PB 125 YEARS

Report Title	:	**Phase II Breeding Bird Report: Gateway Energy Centre Gas and Grid Connection Routes**
Job No	:	**63958A**
Date	:	**January 2011**
Prepared by	:	**Tom McArthur**
Checked by	:	**Vicky Smith**
Approved by	:	**Richard Wearmouth**

Document History and Status

Report Issue	Date of Issue	Prepared By:	Checked By:	Approved By:
1	Jan 2011	Tom McArthur	Vicky Smith	Richard Wearmouth

CONTENTS

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Parsons Brinckerhoff Ltd (PB) has been commissioned by InterGen to undertake a detailed breeding bird survey south and east of Stanford-le-Hope, Essex to inform the construction of the proposed gas pipeline and associated AGI / electrical connection and sub-station associated with the Gateway Energy Centre Combined Cycle Gas Turbine (CCGT) Power Station (GEC).

The exact alignment / routes and locations of the proposed gas pipeline and associated AGI / electrical connection and sub-station have yet to be finalised. However, the indicative alignment / routes and locations have been established and form the basis of this assessment. The survey area encompasses a 250 m buffer either side of an indicative approximate 7.7 km long gas pipeline and 6 km long electrical connection. The survey area is situated between TQ 677 810 and TQ 732 817. The habitat is dominated by arable, grazing marsh and brownfield sites, separated by a large branching network of hedgerows with water-bodies present throughout.

The objective of the assessment was to document breeding bird distribution to establish the level of activity throughout the survey area, to determine whether the proposed development is going to cause negative impacts on breeding birds and to provide / suggest suitable mitigation.

Thomson Ecology has undertaken surveys within the survey area associated with the LG Development in 2001, 2002 and 2008. PB undertook additional breeding bird surveys within those sections of the survey area not surveyed by Thomson Ecology in the last two years.

A total of 54 species were recorded during the breeding bird surveys of which 6 species were confirmed as breeding on the site. A further 22 species were either likely or possibly nesting on the site. There were 17 species recorded on the site that were not breeding but used the site for feeding or were flying over the site.

All of the species recorded were located in the typical habitats for which they are known to use for breeding or foraging.

Of the 54 species recorded during the surveys 24 species are subject to at least one of the conservation criteria presented in Section 2.4.

No species recorded were recognised as having European Conservation Designation as defined by the EU Birds Directive Annex 1 list.

Six species (little ringed plover, hobby, barn owl, black redstart, Cetti's warbler and bearded reedling) were recorded that are subject to special National Protection through Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

Eight species (cuckoo, skylark, yellow wagtail, song thrush, willow tit, starling, corn bunting and yellowhammer) are listed on the Birds of Conservation Concern (BoCC) Red List.

Eleven species (cuckoo, skylark, yellow wagtail, dunnock, song thrush, willow tit, spotted flycatcher, starling, house sparrow, linnet, yellowhammer) are included on the UK Biodiversity Action Plan (BAP) as priority species and are included on the published list of living organisms and types of habitat which in the Secretary of State's opinion are of principal importance for the purpose of conserving biodiversity (this forms Section 41 of the Natural Environment and Rural Communities Act 2006 as Species of Principal Importance in England). UK BAP species are not afforded special protection but are considered to be under threat in a UK context and have action plans proposed or in place to promote the recovery of those species. Furthermore, skylark and song thrush are included in the Essex BAP.

Nine species (kestrel, black-headed gull, common gull, common tern, dunnock, black redstart, bearded reeling, whitethroat, reed bunting) were listed on the BoCC Amber List.

Further surveys may be required for Schedule 1 species such as Cetti's warbler, bearded tit and barn owl. The requirement of any such additional surveys should be reviewed once the final locations of the route, HDD compounds and sub-station have been agreed. At present no further surveys are

considered necessary.

It is recommended that where possible, vegetation clearance is undertaken outside the breeding period. However, where this is not possible an experience ecologist should be on site to ensure the works do not adversely affect any breeding birds.

To reduce the effects of construction noise and human disturbance on breeding birds, construction and all vegetation clearance on site should take place outside of the breeding bird season (March – August inclusive). However, given the anticipated construction program commencing in spring 2012 / 2013 and taking six to nine months to complete, some construction activities may occur within this period.

With the implementation of these recommendations, the proximity of large areas of suitable nesting habitat surrounding the proposed site and the temporary nature of the construction works, the long-term ability of the area to be utilised by breeding birds would not be affected and breeding birds will not be a constraint to the proposals.

SECTION 1

INTRODUCTION

1 INTRODUCTION

1.1 Overview

1.1.1 Parsons Brinckerhoff Ltd (PB) has been commissioned by InterGen to undertake a detailed breeding bird survey, south and east of Stanford-le-Hope, Essex. The assessment will inform the construction of the proposed gas pipeline and associated AGI / electrical connection and sub-station associated with the Gateway Energy Centre Combined Cycle Gas Turbine (CCGT) Power Station (GEC).

1.1.2 It was identified within the Ecological Scoping Assessment (PB, 2010) that a range of habitats suitable to support a variety of breeding bird species could be affected by the proposed developemnt. Breeding bird surveys were therefore recommended to identify the distribution and abundance of breeding birds in the area, to ensure that breeding birds are not adversely affected and to ensure legal compliance.

1.1.3 Detailed breeding bird surveys were undertaken across the survey area in 2001, 2002 and 2008 as part of the adjacent LG Development. The most recent surveys completed by Thomson Ecology in 2008 are still considered to be valid and have been used to inform much of this assessment.

1.1.4 This report assesses the 2008 Thomson Ecology data with additional data collected by PB in 2010 to determine the potential impact of the proposed development on the local breeding bird populations and proposes mitigation measures where necessary.

1.2 Site Context

1.2.1 GEC will be location on land within the LD Development.

1.2.2 The GEC site is situated on the north bank of the Thames Estuary and lies approximately 6 km east of the A13. The A1014 dual carriageway (The Manorway) is located to the north of the site and runs east to west to provide a link with the A13, which in turn links in with the M25 at Junction 30. The River Thames runs in a west to east direction to the south of the site where DP World has recently commenced works on the new port facility associated with the LG Development.

1.2.3 The nearest residential settlements to the GEC site are at Stanford-le-Hope, Corringham and Fobbing which lie approximately 4 km to the west, Canvey Island approximately 5 km to the east, and Basildon approximately 7 km to the north.

1.2.4 To the east of the GEC site is the existing Coryton CCGT Power Station (700 m east), Shell Aviation Fuel Storage Farm and Petroplus' Coryton Oil Refinery (950 m east).

1.2.5 The LG Development comprises a deep-sea global container shipping port (LG Port) and a logistics and commercial centre (LG Logistics and Business Park). These are currently being developed on the site of the former Shell Oil Refinery at Shell Haven near Corringham and Stanford-le-Hope (Essex) on the northern banks of the Thames Estuary.

1.2.6 Prior to planning permission being granted, detailed ecological surveys were undertaken within the LG Development footprint and its immediate surroundings.

1.2.7 The underground gas pipeline and associated AGI are required to deliver the natural gas to be used as fuel by the gas turbines at GEC. At the AGI (OS Grid reference TQ 677 810), the natural gas will be taken from a connection to the existing National Grid National Transmission System (NTaS) Number 5 Feeder pipeline.

1.2.8 From the AGI, the underground gas pipeline will cross a range of arable, marsh and brownfield habitats and an area of land designated as a protected species receptor site for the LG Development, eventually connecting to GEC (OS Grid reference TQ 732 817) (see Figure 1). The underground gas pipeline will be laid using a combination of both surface excavation and horizontal directional drilling (HDD). The pipe is expected to measure approximately 16 inches in diameter and will be laid at a

depth of approximately 1.2 m, using a working corridor of approximately 30 m where HDD is not used. Works are proposed to commence in either 2012 or 2013 and will take approximately six to nine months to complete.

1.2.9 If the electrical connection is over ground, it is likely to be fitted to new overhead pylons. It will run for approximately 6 km from GEC to a sub-station to be consented and constructed by National Grid. At the time of writing there are four possible sub-station locations, all situated to the west of the GEC site. All four possible locations have been included within this assessment (Figure 1). However, it should be noted, that a separate detailed assessment of the four sub-station locations, the inter-connecting cabling and all associated infrastructure is being undertaken independently of this assessment.

1.2.10 The exact alignment / routes and locations of the proposed gas pipeline and associated AGI / electrical connection and sub-station have yet to be finalised. However, the indicative alignment / routes and locations have been established and form the basis of this assessment. The indicative route for the gas pipeline and electricity connection will follow the alignment of an existing CECL Power Station gas pipeline as it is most likely that they will be laid as close to one another as possible to allow for easy management and maintenance. The 'proposed development' for the purposes of this Document therefore includes the gas pipeline and associated AGI / electrical connection and 4 preferred sub-stations.

1.2.11 A detailed breeding bird survey was undertaken by Thomson Ecology in 2008 to inform the planning requirements for the LG Development. Thomson Ecology surveyed all land within the LG Development boundary and its immediate surroundings (Figure 1).

1.2.12 The majority of the proposed development is located outside of, but in close proximity to, the LG Development, its receptor sites and access routes. Therefore, large sections of the survey area have already been surveyed for breeding birds (Figure 2). Much of the data recently collated for the LG development is therefore relevant to this assessment and has been used to form much of the baseline. Areas of suitable habitat that were not previously surveyed by Thomson Ecology have been surveyed and assessed by PB in 2010.

1.3 Legislation and Planning Context

1.3.1 The Wildlife and Countryside Act 1981 (as amended) (WCA) makes it an offence to intentionally kill, injure, or take any wild bird or their eggs or nests. In addition, there are penalties for any offences relating to the disturbance of species listed on Schedule 1 of the WCA.

1.3.2 Activities such as vegetation clearance during the nesting season could result in the intentional killing or injury of a nesting bird or the disturbance of a Schedule 1 species and thus an offence occurring under the WCA.

1.3.3 The bird breeding season can be taken to occur between March and August inclusive, although this is subject to variations based on species, geographical and seasonal factors.

1.3.4 There are several other pieces of legislation and government policy which must be adhered to, these include:

- EC Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive);
- Countryside and Rights of Way Act 2000 (CRoW Act 2000);
- Natural Environment and Rural Communities Act 2006 (NERC Act 2006);

- Planning Policy Statement 9 (PPS 9): Biodiversity and Geological Conservation and Circular 06/05: Biodiversity and Geological Conservation – Statutory Obligations and their Impact on the Planning System;
- The UK Biodiversity Action Plan (UKBAP); and
- Essex Biodiversity Action Plan (Essex BAP).

SECTION 2

METHODOLOGY

2 METHODOLOGY

2.1 Desk Study

2.1.1 A desk study was undertaken in 2010 as part of the Ecological Scoping Report (PB, 2010) to obtain any historically held bird records. The majority of the records were obtained from Stanford Warren Nature Reserve SINC.

2.2 Field Survey

2.2.1 The survey area was divided into three distinct 'Areas' to facilitate the assessment as follows:

- **Area 1**: transect line walked in Mucking by PB ecologists;
- **Area 2**: transect line walked in Corringham by PB ecologists; and
- **Area 3**: previously surveyed by Thomson Ecology in 2008.

2.2.2 Figure 2 gives the locations of three survey areas and illustrates how the 2008 and 2010 surveys complement each other to cover the entire proposed development area.

2.2.3 The following methodologies were used for both the Thomson Ecology surveys in 2008 and the PB surveys in 2010.

Registration Mapping

2.2.4 The survey methodology involved standard territory (registration) mapping techniques as detailed in the "Common Bird Census" (CBC) by Bibby *et al*. (2000). This method is based on the observation that many species during the breeding season are territorial. This is found particularly amongst passerines, where territories are often marked by conspicuous song, display, and periodic disputes with neighbouring individuals.

2.2.5 Registrations of birds, using standard British Trust for Ornithology (BTO) two letter species codes, were recorded on an appropriately scaled field map (scale 1:5000). Specific codes were also used to distinguish between different behaviours, such as singing, calling, flying, carrying food, nest building, aggressive encounters and other behaviour. The expected outcome of this technique is that mapped registrations fall into clusters, approximately coinciding with territories. Where a species has closely packed territories the mapping of simultaneously singing birds becomes essential.

2.2.6 The predicted breeding status of a species was determined if one or more of the following activities were recorded:

- Territorial / Alarm Calling
- Song
- Aggressive Encounter
- Occupied Nest / Nest Box / Sitting on Nest
- Carrying Nest Material
- Carrying Food

2.2.7 A transect line, which ensured all major habitats and land within each survey area would be surveyed was identified prior to the first surveys. During each survey the transect was walked at a slow pace in appropriate good weather conditions (see Table 2.1) in order to locate and identify all individual birds. Visits were undertaken early in the morning, generally between 05:00 – 09:00 AM. The entire survey area was covered during each visit, using suitable optical equipment (Opticron 8 x 42 Countryman binoculars) to observe bird species and behaviour. Survey routes were

walked in opposite directions on each visit, to ensure that all areas were covered at various times across the duration of the survey.

TABLE 2.1: BREEDING BIRD SURVEY DETAILS

Date	Survey Area	Survey Time	Weather Conditions
26 April 2010	2	06:45 – 08:45	5°C Bright and sunny, cloud cover 4 / 8
4 May 2010	1	06:30 – 08:30	13°C Sunny and hot , cloud cover 1 / 8
12 May 2010	2	06:00 – 08:00	7-9°C Bright and sunny, cloud cover 2 / 8
9 June 2010	1	06:00 - 08:00	13°C clear skies, cloud cover 0 / 8
23 June 2010	2	05:00 – 08:00	12°C Overcast, rain the night before, cloud cover 6 / 8
24 June 2010	1	05:00 – 07:00	13°C Clear with no wind or rain

2.2.8 The following definitions have been used to identify the breeding status of the species recorded:

- Confirmed Breeding: Includes species for which territories were positively identified as a result of the number of registrations (in this case two), the location of an active nest and the presence of recently fledged young or downy young.
- Likely Breeding: Includes a pair observed in suitable nesting habitat in breeding season, agitated behaviour or anxiety calls from adults, suggesting probable presence of nest or young nearby. Behaviour was observed on insufficient occasions to confirm the presence of a territory.
- Possible Breeding: Includes species observed during the breeding season in suitable nesting habitat, singing male present (or breeding calls heard) in breeding season in suitable breeding habitat.
- Non-breeding: Species showed no signs of breeding behaviour, as listed above. Birds which were recorded commuting across the survey area, for example species observed but suspected to be still on migration. Species did not have suitable breeding habitat within the survey area. Species observed but suspected to be summering non-breeder.

2.3 Data Evaluation

2.3.1 Following the field surveys, an assessment of the ornithological importance of the study area was made. The following criteria were considered:

- Annex 1 of the EU Birds Directive (Directive 79/409/EEC);
- Schedule 1 of the Wildlife and Countryside Act 1981, (as amended);
- Birds of Conservation Concern (BoCC) Red and Amber Lists (Eaton et al., 2009);
- UK Biodiversity Action Plan (UK BAP) priority species (Anon, 1998; Anon, 1999);
- NERC Act: Section 41; Species of Principal Importance in England

2.3.2 Red List species are those that meet at least one of the following criteria:

- are globally threatened;
- have suffered a historical population decline in the period 1800-1995 without substantial recent recovery;
- have suffered a rapid (>50%) population decline in their UK breeding population over the last 25 years;
- have suffered a rapid (>50%) contraction in their UK breeding range over the last 25 years.

2.3.3 Amber List species are those that meet at least one of the following criteria:

- have suffered a moderate (25-49%) decline in their UK breeding population over the last 25 years;
- have suffered a moderate (25-49%) contraction in their UK breeding range over the last 25 years;
- are Species of European Conservation Concern (SPEC);
- have a five year mean of between 1 and 300 breeding pairs in the UK;
- have >50% of the UK breeding population in 10 or fewer sites;
- have >50% of the UK non-breeding population in 10 or fewer sites;
- have >20% of the European breeding population in the UK;
- have >20% of the NW European (wildfowl), East Atlantic Flyway (waders) or European (others) non-breeding populations in the UK.

2.4 Survey Limitations

2.4.1 Information received on the surveys undertaken by Thomson Ecology in 2001, 2002 and 2008 was limited and only consisted of a list of Schedule 1 and UK BAP / Red listed species recorded. No information such as the specific locations of the transect lines or breeding bird registration mapping was available. This presented a limitation in data interpretation and assessing the value of the area, however, the extent of the survey area and the data on the rarest or most protected species was available.

SECTION 3

RESULTS

3 RESULTS

3.1 Desk Study

3.1.1 An extensive list of bird records was obtained for Stanford Warren Nature Reserve and Site of Interest for Nature Conservation (SINC) located within Area 1. 14 Schedule 1 species have been recorded within the past ten years in addition to many BAP, Red and Amber Listed species of conservation concern. The 14 Schedule 1 species which are most relevant for this assessment are summarised in Table 3.1 below.

TABLE 3.1: SCHEDULE 1 BIRD SPECIES RECORDED WITHIN STANFORD WARREN NATURE RESERVE AND SINC

Common Name	Latin Name
Barn owl	*Tyto alba*
Bearded reedling	*Panurus biarmicus*
Brambling	*Fringilla montifringilla*
Cetti's warbler	*Cettia cetti*
Kingfisher	*Alcedo atthis*
Avocet	*Recurvirostra avosetta*
Fieldfare	*Turdus pilaris*
Hobby	*Falco subbuteo*
Marsh harrier	*Circus aeruginosus*
Mediterranean gull	*Larus melanocephalus*
Peregrine	*Falco peregrinus*
Redwing	*Turdus iliacus*
Scaup	*Aythya marila*
Whimbrel	*Numenius phaeopus*

3.2 Habitat Summary

3.2.1 Area 1 contained a diverse range of habitats suitable for a range of common bird species and species of conservation concern. Habitats include woodlands, scrub, reedbeds, hedgerows, water bodies, arable and grassland fields.

3.2.2 Area 2 contained habitat associated with farmland fields and marshy grassland such as arable and grassland fields, ditches, water bodies, reedbeds and hedgerows.

3.2.3 Area 3 contained habitat similar to that found in Area 2, with larger areas of arable fields, ditches, marshy grassland, reedbeds and brownfield areas.

3.2.4 For a full description and location of these habitats please refer to the Ecological Scoping Report (PB 2010).

3.3 Breeding Bird Surveys

2008 Thomson Ecology Survey Data

3.3.1 Breeding bird surveys undertaken by Thomson Ecology in 2008 as part of the LG Development indicated the presence of five Schedule 1 species and 11 UK BAP / Red list species within the survey area (Area 3). These species are summarised in Table 3.2 below.

2010 Breeding Bird Surveys

3.3.2 During the 2010 breeding bird surveys, 45 bird species were recorded in up to 125 potential breeding territories. These species together with their conservation and breeding status on site are included in the summary Table 3.2 below. All species recorded were located in the typical habitats for which they are known to use for breeding or foraging.

3.3.3 In total, at least 54 species were recorded during the 2008 and 2010 breeding bird surveys, of which 6 species were confirmed as breeding on the site, 22 species were either likely or possibly nesting on the site. A further 17 species recorded were not breeding but could be potentially using the site for foraging.

3.3.4 See Figure 2 for details of each species recorded and their behaviour and locations.

2010 Incidental Records

3.3.5 Appendix A contains a list of bird species incidentally recorded during the Phase I habitat walkover survey as part of the Ecological Scoping Report (PB: 2010) conducted between the 12th and 16th of April and on the 18th of May 2010. This list includes 7 UK BAP species, 8 Red list species and 15 Amber list species, all of which were also recorded during the 2008 and 2010 breeding bird surveys.

3.3.6 Additionally, a pair of barn owls, a Schedule 1 species, was observed during a bat survey on the 18th August 2010 in survey Area 1.

TABLE 3.2: SUMMARY OF BREEDING BIRD SURVEY RESULTS

Common name	Latin name	Breeding status	Schedule 1 Wildlife & Countryside Act 1981 (1)	Birds of Conservation Concern (2)	UK BAP Priority Species (3) / Section 41 NERC (4)	Essex BAP Species (5)	Area 1 (PB 2010)	Area 2 (PB 2010)	Area 3 (Thomson Ecology 2008)
Grey Heron	*Ardea cinerea*	Non breeding							
Mute Swan	*Cygnus olor*	Non breeding							
Mallard	*Anas platyrhynchos*	Likely							
Kestrel	*Falco tinnunculus*	Non breeding		Amber					
Hobby	*Falco subbutteo*	Unknown							
Little Ringed Plover	*Charadrius dubius*	Unknown							
Pheasant	*Phasianus colchicus*	Non breeding							
Grey Partridge	*Perdix perdix*	Unknown		Red					
Coot	*Fulica atra*	Likely							
Moorhen	*Gallinula chloropus*	Confirmed							
Black-headed Gull	*Larus ridibundus*	Non breeding		Amber					
Common Gull	*Larus canus*	Non breeding		Amber					
Common Tern	*Sterna hirundo*	Non breeding		Amber					
Lapwing	*Vanellus vanellus*	Unknown		Red					
Stock Dove	*Columba oenas*	Non breeding							
Woodpigeon	*Columba palumbus*	Confirmed							
Collared Dove	*Streptopelia decaocto*	Possible							
Cuckoo	*Cuculus canorus*	Non breeding*		Red					
Barn Owl	*Tyto alba*	Likely		Amber			+		

Common name	Latin name	Breeding status	Schedule 1 Wildlife & Countryside Act 1981 (1)	Birds of Conservation Concern (2)	UK BAP Priority Species (3) / Section 41 NERC (4)	Essex BAP Species (5)	Area 1 (PB 2010)	Area 2 (PB 2010)	Area 3 (Thomson Ecology 2008)
Green Woodpecker	*Picus viridis*	Non breeding							
Great Spotted Woodpecker	*Dendrocopos major*	Possible							
Skylark	*Alauda arvensis*	Confirmed		Red					
Yellow Wagtail	*Motacilla flava*	Non breeding		Red					
Pied Wagtail	*Motacilla alba*	Non breeding							
Wren	*Troglodytes troglodytes*	Likely							
Dunnock	*Prunella modularis*	Non breeding		Amber					
Robin	*Erithacus rubecula*	Likely							
Black redstart	*Phoenicurus ochurroc*	Unknown		Amber					
Blackbird	*Turdus merula*	Likely							
Song Thrush	*Turdus philomelos*	Non breeding		Red					
Sedge Warbler	*Acrocephalus schoenobaenus*	Possible							
Cetti's Warbler	*Cettia cetti*	Unknown							
Reed Warbler	*Acrocephalus scirpaceus*	Confirmed							
Whitethroat	*Sylvia communis*	Likely		Amber					
Garden Warbler	*Sylvia borin*	Non breeding							
Spotted Flycatcher	*Muscicapa striata*	Unknown		Red					
Blackcap	*Sylvia atricapilla*	Possible							

Common name	Latin name	Breeding status	Schedule 1 Wildlife & Countryside Act 1981 (1)	Birds of Conservation Concern (2)	UK BAP Priority Species (3) / Section 41 NERC (4)	Essex BAP Species (5)	Area 1 (PB 2010)	Area 2 (PB 2010)	Area 3 (Thomson Ecology 2008)
Chiffchaff	*Phylloscopus collybita*	Possible							
Willow Tit	*Poecile montanus*	Possible		Red					
Great Tit	*Parus major*	Possible							
Blue Tit	*Cyanistes caeruleus*	Likely							
Bearded Reedling	*Panurus biarmicus*	Unknown		Amber					
Magpie	*Pica pica*	Likely							
Jackdaw	*Corvus monedula*	Possible							
Carrion Crow	*Corvus corone*	Possible							
Starling	*Sturnus vulgaris*	Non breeding		Red					
House Sparrow	*Passer domesticus*	Unknown		Red					
Chaffinch	*Fringilla coelebs*	Likely							
Linnet	*Carduelis cannabina*	Unknown		Red					
Greenfinch	*Carduelis chloris*	Confirmed							
Goldfinch	*Carduelis carduelis*	Possible							
Reed Bunting	*Emberiza shoeniclus*	Likely		Amber					
Yellowhammer	*Emberiza citrinella*	Possible		Red					
Corn Bunting	*Miliaria calandra*	Confirmed		Red					

1. *Species protected by Schedule 1 of the Wildlife & Countryside Act 1981.*

2. *Species on the Birds of Conservation Concern Red and Amber lists (Eaton et al., 2009).*

3. *Priority Species in the UK Biodiversity Action Plan (Anon, 2007).*

4. *Species of Principal Importance in England listed on Section 41 of the Natural Environment and Rural Communities Act (NERC) 2006*

5. *Species included in the Essex Biodiversity Action Plan*

Non breeding ***Confirmed*** *- Confirmed breeding*

Likely *– Likely breeding* ***Possible*** *– Possibly breeding*

Unknown *– Data collected by Thomson Ecology*

** = Cuckoo observed, however, this species is hard to determine breeding status due to its breeding behaviour.*

+ = Recorded during a bat survey 18th August 2010.

SECTION 4

EVALUATION AND RECOMMENDATIONS

4 DISCUSSION AND RECOMMENDATIONS

4.1 Overview

4.1.1 The survey area is dominated by arable fields, improved grassland and brownfield land. Although these habitats are not optimum for a wide range of breeding bird species they are important for ground nesting species such as skylarks. A diverse network of other less dominant habitats, such as scrub, reedbeds, hedgerows, ditches, marshy grassland and water bodies are also present throughout. This diversity of habitats, as well as the remoteness and strategic location of the survey areas adjacent to the Thames Estuary, indicates that they should be suitable to support a diverse range of breeding birds.

Breeding Status

4.1.2 Of the 54 species recorded within the survey area;

- 6 were confirmed to be breeding; moorhen, woodpigeon, skylark, reed warbler, greenfinch and corn bunting.
- 11 were confirmed likely to be breeding; coot, mallard, barn owl, wren, robin, blackbird, whitethroat, blue tit, magpie, chaffinch and reed bunting.
- 11 were confirmed to be possibly breeding; collared dove, great spotted woodpecker, sedge warbler, blackcap, chiffchaff, willow tit, great tit, jackdaw, carrion crow, goldfinch and yellowhammer.
- 10 were of unknown breeding status; hobby, little ringed plover, grey partridge, lapwing, black redstart, Cetti's warbler, spotted flycatcher, bearded reedling, house sparrow and linnet.
- All remaining species were confirmed as non-breeding.

4.1.3 The number of species recorded in an area is a simple measure of diversity that can indicate the conservation value of the area. Fuller (1980) gives the following breeding diversity criteria presented in Table 4.1:

TABLE 4.1: FULLER BREEDING BIRD ASSEMBLAGE VALUATION CRITERIA

Value	Number of Breeding Bird Species
National	85+
Regional	70 – 84
County	50 – 69
Local	25 - 49

4.1.4 Based on Fuller's criteria, the breeding bird assemblage of the survey area is of **Local value** (calculated from the number of confirmed breeding and likely breeding species, 17 in total)**.** However, it should be noted that Fuller's analysis was developed in the 1970's. Since then species diversity has declined significantly. It is therefore considered that Fuller's thresholds are potentially too high for today's breeding bird populations. However, as the number of species recorded breeding on site, 17, is towards the lower limits of the 'Local Value' threshold (25 – 49), the change is species diversity in recent decades is not likely to have affected the areas value.

Conservation Status

4.1.5 An alternative method of assessing the value of a surveys area for birds, although not an official quantitative assessment, is to analyse how many of the species recorded are notable or protected within the UK.

4.1.6 Of the 54 species recorded, 24 species (approximately 45% of the species assemblage) are subject to some level of protection or conservation criteria. Although the survey area is considered to only be of local value for breeding birds (as per the Fuller criteria) it is obviously important and of increased value for less common birds or birds which have experienced population declines in recent years.

4.1.7 Of these protected and / or notable species only five were confirmed to be breeding, likely to be breeding or possibly breeding as confirmed by the footnotes.

4.1.8 Six species (little ringed plover, hobby, barn owl[1], black redstart, Cetti's warbler and bearded reedling) which are all subject to national protection through Schedule 1 of the WCA were recorded within the survey area.

4.1.9 Eight species (cuckoo, skylark[2], yellow wagtail, song thrush, willow tit, starling, corn bunting[2] and yellowhammer) are listed on the BoCC Red List. Nine species (kestrel, black-headed gull, common gull, common tern, dunnock, black redstart, bearded reedling, whitethroat and reed bunting[1]) are listed on the BoCC Amber List.

4.1.10 Furthermore eleven species (cuckoo, skylark[2], yellow wagtail, dunnock, song thrush, willow tit, spotted flycatcher, starling, house sparrow, linnet and yellowhammer[3]) are included on the UK BAP as priority species. UK BAP species are not afforded special protection but are considered to be under threat in the UK and have action plans proposed or in place to promote the recovery of those species. The same eleven species and are included on the published list of living organisms and types of habitat which in the Secretary of State's opinion are of principal importance for the purpose of conserving biodiversity (this forms Section 41 of the Natural Environment and Rural Communities Act 2006 as Species of Principal Importance in England). Skylark and song thrush are also included in the Essex BAP.

Population Size

4.1.11 None of the breeding species occurred in nationally significant numbers.

4.2 Impact Assessment of Survey Areas

Impacts Associated with the Construction of the Pipeline

4.2.1 The 30 m wide working width associated with the construction of the pipeline and reinstatement of the ground is anticipated to take approximately six months to complete. It is understood that installation works are only likely to be carried out at any one point along the route for one to two weeks as the pipeline is laid in stages. During this time the boundary of the pipeline route where works are being undertaken would be fenced, the topsoil stripped, and the trench excavated prior to construction and installation of the pipeline commencing. Increased noise, light and vibration disturbance and an increase in dust deposition are therefore likely to be highly localised and very temporary in nature.

4.2.2 The greatest impact envisaged on the local bird population will result from the temporary loss of habitat from within the 30 m working corridor. The loss of habitats from within this working width is likely to affect both nesting and foraging birds. Such habitat loss could, in turn, result in the indirect reduction in certain bird territories and the fragmentation of their habitats.

4.2.3 The majority of land expected to be bisected by the indicative route comprises large, well managed grassland or arable fields separated by a network of connected drainage ditches and hedgerows. Up to five hedgerows are expected to be affected within Area 1 where four species listed on the BoCC Red List and UK BAP were recorded (skylark, song thrush, willow tit and starling). Up to six ditches and no

[1] *Likely to be breeding within the survey area.*
[2] *Confirmed to be breeding within the survey area.*
[3] *Possibly breeding within the survey area.*

hedgerows will be affected in Area 2 where six BoCC Red List and / or UK BAP species were recorded (cuckoo, skylark, song thrush, yellowhammer, yellow wagtail and corn bunting). Finally, up to 13 ditches and six hedgerows are likely to be affected in Area 3 where eight BoCC Red List and / or UK BAP species were recorded (lapwing, skylark, song thrush, spotted flycatcher, house sparrow, linnet, yellowhammer and corn bunting). These habitat losses equate to nearly 350 m of temporarily lost hedgerows and nearly 600 m of temporarily lost ditches.

4.2.4 Of principal nature conservation interest, one Schedule 1 species, barn owl was recorded adjacent to Stanford Warren Nature Reserve flying over arable fields to the north of Mucking village. Given the distance of the proposed works from the nearest possible roosting structure (a derelict barn structure, approximately 130 m to the south), it is anticipated that impacts to this species would only include temporary loss of a small area of foraging habitat. The location of the barn owl breeding site is currently unknown. Under current plans no buildings or potential roosting sites are to be directly affected and due to the temporary nature and small footprint of the proposed development it is likely that any impact would be minimal. Subsequently, no barn owl specific surveys are considered necessary.

4.2.5 Six Scheduled 1 species (hobby, little ringed plover, barn owl, black redstart, Cetti's warbler and bearded reeling) were recorded in Area 3. Breeding status of these species is unknown. However, habitat within the survey area is only suitable for Cetti's warbler and bearded tit; both species that nest adjacent to waterbodies, fringed channels and ditches of dense expanses of reed. To ensure no offence is committed under the current legislation, further surveys may be required to assess any potential impacts. The requirement of these surveys will be confirmed following confirmation of the final alignment of the gas and grid connection routes and AGI / sub-station locations.

4.2.6 The indirect impacts envisaged on site include an increase in noise, light and vibration disturbances and an increase in dust deposition. However, it is understood that many species of bird are adaptable and tolerant to some low levels of disturbance. Following best practice construction methodologies, such as the restriction of works to daylight hours and the sensitive use of lighting, these impacts are likely to be highly localised, temporary in nature and are therefore not likely to significantly affect the local bird population. Details on the recommendations for best practice are provided below.

4.2.7 Impacts on all species are likely to include the temporary loss of nesting habitat, disturbance from increased lighting, noise and vibration. Unmitigated these impacts could result in the disturbance of breeding birds and the breech of UK legalisation. Recommendations to avoid and minimise any adverse affects are provided below. Following these recommendations and given the availability of similar habitats in the wider area, the temporary nature of the works associated with the proposed development and relatively small footprint of the proposed development, these impacts envisaged from the excavation of the gas pipeline are likely to be negligible.

Impacts Associated with the HDD Tunnelling

4.2.8 Under current plans three sections of the proposed pipeline are to be laid using HDD technology; under Stanford Warren Nature Reserve and twice under the A1014 (The Manorway).

4.2.9 The exact locations of the HDD tunnelling sites are still to be confirmed. However, it is understood, that the HDD bore-holes will be positioned in arable or grassland fields. The clearance of access tracks required to remove the excavated spoil from the sites may lead to further temporary loss of arable or grassland fields. No hedgerows or ditches are likely to be directly affected. The only envisaged impacts would therefore be at and around the access and egress points of the bore hole.

4.2.10 The site footprint for each bore hole and associated traffic access is likely to require a larger area of land than the 30 m wide working width required for the trench excavation; potentially resulting in a larger area of temporary habitat loss. The tunnelling works may also take longer to complete. The HDD works are therefore likely to lead to proportionally greater localised noise and vibration disturbances than those associated with the trench excavation. However, it should be acknowledged that the remainder of the HDD route is likely to remain unaffected as the pipeline or cable is laid deep underground.

4.2.11 Very little habitat loss, either temporary or permanent is therefore envisaged given the length of pipeline which will be laid comparative to the area required for the access or egress locations. The habitat loss may directly affect arable grassland or arable species, such as skylarks or reed buntings. Additionally, species present within the surrounding grassland, trees and hedgerows maybe indirectly adversely affected.

4.2.12 Unmitigated, the small scale land take and more wide reaching indirect impacts could adversely affect breeding birds and therefore result in a breech of UK legislation. It is therefore recommended that the best practice methodologies, outlined below, are employed. With the implementation of the recommendations, any envisaged impacts on breeding birds are likely to be negligible. However, it is advised that the recommendations relevant to the HDD compounds are reviewed once the final locations of the compounds have been confirmed.

Impacts Associated with the Construction of the Sub-Station Options

4.2.13 The construction of the sub-station and any required associated infrastructure is likely to be a significant undertaking. It will take many months to complete and lead to the permanent loss of approximately one hectare of land. Additionally, the potential construction of new pylons, which are yet to be confirmed, would result in the temporary disturbance of the ground but the permanent loss of a negligible amount of land (the feet of the pylon). The preferred sub-station options 1, 5a, and 10, are all situated within large arable fields which are surrounded by hedgerows and wet and dry ditches. Assuming that the construction compound for the sub-station is located completely within the arable field and access requires utilise existing roads and access points, the impact of the sub-station is likely to only directly affect bird species dependant on arable fields.

4.2.14 The footprint of sub-station 5b is located in an area of land adjacent to an industrial estate therefore more likely to affect species commonly associated with brownfield scrub habitats. It is also bounded by the railway vegetation to the north and several mature oak trees associated scrub, immature woodland and a recently created wetland scrap to the south.

4.2.15 The indirect impacts from increased noise, dust, vibration and lighting are envisaged at all of the sub-station options but are likely to be most adverse around option 5b given the suitability of the surrounding habitat. The operational lighting of the chosen sub-station may also result in permanent indirect impacts.

4.2.16 It is understood that further, more detailed assessments will be undertaken on behalf of National Grid when more details are available about the size and location of the options.

Summary

4.2.17 Based on the range of breeding species, value of the breeding assemblage and absence of highly specialised habitats, it is considered that with the implementation of generic mitigation, such as use of sensitive lighting and the replanting of disturbed habitats (full details provided below), it will be feasible to avoid significant impacts to breeding birds.

4.3 General Recommendations

4.3.1 Based on the indicative route, no further survey or assessment for the Schedule 1 species such as Cetti's warbler or barn owls is considered necessary at this stage. However, this requirement should be reassessed following the confirmation of the final alignment of the gas and grid connection routes and AGI / sub-station locations (particularly for Cetti's warbler and bearded reedling).

4.3.2 It is recommended that the clearance of vegetation is avoided, where possible, for example, the alignment of pipeline route should use existing gaps in hedgerows or be altered to take advantage of existing gaps in vegetation. This can be achieved at the design stage or on site by moving the pipelines alignment within the 30 m working corridor.

4.3.3 Where vegetation must be removed, the following measures should be adhered to;

- All clearance should undertaken outside the nesting season. This is widely considered to be from March to August inclusive, but can vary depending on the species and / or weather.
- Where vegetation can not be removed outside of the nesting season, pre-clearance checks must be undertaken by an experienced ecologist to identify if any birds are nesting within or close to the vegetation due to be removed. An informed decision should then be made if the vegetation clearance can be undertaken. If a bird nest is found no works can be undertaken in that area until the young birds have fledged the nest site. This may take several weeks and will vary depending on the species.
- Construction activities will be undertaken within the defined 30 m wide working width to limit any unnecessary disturbances.
- All construction related lighting should be designed and fitted to minimise any adverse impacts on the retained surrounding vegetation.
- Where possible, all construction works should be restricted to day light hours for example 07:00 to 19:00 to prevent any easily avoidable, adverse impacts on roosting birds at dusk and dawn.
- Should any Schedule 1 species or active Schedule 1 nest sites be identified during construction all works will be suspended within that area and advise sought from a suitably qualified ecologist on the most appropriate course of action.
- Where construction works have the potential to affect active nest sites a suitably qualified ecologist will supervise.
- The footprint of the working corridor will be landscaped post-construction to ensure the vegetation removed is replaced, for at least like for like. Where possible improved species diversity or increased habitat planting should be sought; for example, the filling in of existing gaps in hedgerows and the use of species of local province.

4.3.4 To provide biodiversity enhancement to breeding birds, and in accordance with PPS9, specific consideration should be given to enhancing the site. This could be implemented in addition to the replacement of lost vegetation specifically for those species of conservation interest recorded during the survey, particularly the Schedule 1 species and UK and Essex BAP species. Measures could include the provision of specific nest boxes for barn owls or the planting of reeds in wetland areas or ditches for Cetti's warbler and bearded reedlings.

SECTION 5

CONCLUSION

5 CONCLUSION

5.1.1 Breeding birds were recorded throughout the survey area. During the 2010 breeding bird surveys, 45 bird species were recorded within up to 125 potential breeding territories. An additional nine species were recorded by Thomson Ecology in 2008, totalling 54 species. Of these six species were confirmed to be breeding on the site and 11 species were possibly breeding on the site. The site was confirmed to be of Local value for breeding birds (Fuller, 1970).

5.1.2 Of the 54 species recorded, 24 species (approximately 45% of the species assemblage) were subject to some degree of protection or conservation interest. Of these protected and / or notable species only five were confirmed to be breeding, likely to be breeding. Additionally, six species of Schedule 1 birds, legally protected by the Wildlife and Countryside Act, 1981 (as amended) were recorded within the survey area, none confirmed as breeding.

5.1.3 The main anticipated impacts constitute the temporary loss of foraging and nesting habitats, such as grassland hedgerows and the increased indirect disturbance of birds due to increased light, noise and vibration levels. No Schedule 1 species is likely to be adversely affected. Unmitigated, these impacts are likely to temporarily affect several common or widespread species of breeding bird.

5.1.4 Mitigation such as the clearance of vegetation outside of the breeding bird season, the use of directional and sensitive lighting and the reinstatement and enhancement of the sites habitats post development, have been provided. With the implementation of these recommendations, the proximity of large areas of suitable nesting habitat surrounding the proposed site and the temporary nature of the construction works, the long-term ability of the area to be utilised by breeding birds would not be affected and breeding birds will not be a constraint to the proposals.

SECTION 6

REFERENCES

6 REFERENCES

Anon. (1981), *The Wildlife & Countryside Act*. HMSO, London.

Anon. (1998), *UK Biodiversity Group Tranche 2 Action Plans.* English Nature, Peterborough.

Anon. (1999), *UK Biodiversity Group Tranche 3 Action Plans*. English Nature, Peterborough.

Anon. (2007), *UK List of Priority Species and Habitats*. JNCC.

Bibby, C.J. Burgess, N.D. Hill, D.A. & Mustoe, S.H. (2000), *Bird Census Techniques. 2nd edition*. Academic Press, London.

BTO (2010), http://www.bto.org/survey/complete/cbc.htm

DP World (2008), *London Gateway Ecological Action Plan, Breeding Birds*.

Eaton MA, Brown AF, Noble DG, Musgrove AJ, Hearn R, Aebischer NJ, Gibbons DW, Evans A and Gregory RD. (2009), *Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man*. British Birds 102, pp296–341.

EU (1979), *On the Conservation of Wild Birds. Council Directive 79/409/EEC*, Brussels.

Fuller, R.J. (1980), *A method for assessing the ornithological interest of sites for conservation*. Biological Conservation 17:229-239.

Gilbert, G., Gibbons D.W. & Evans J., (1998), *Bird Monitoring Methods: A manual of techniques for key species.* RSPB/BTO/JNCC/WWT/ITE/The Seabird Group RSPB/BTO, Sandy.

Parsons Brinckerhoff (2010), *Ecological Scoping Report for the Gateway Energy Centre CCGT Gas Pipeline and Electricity Cabling Routes*, a report for InterGen, July 2010.

FIGURES

FIGURE 1: SITE LOCATION

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Notes

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Gateway Energy Centre

Drawing Title: CCGT Site, and Possible Gas Inlets and Substation Locations

Scale at A3: 1:20,000

Drawn	JL	Approved	TM
Stage 1 check	Stage 2 check	Originated	Date 06/09/2010

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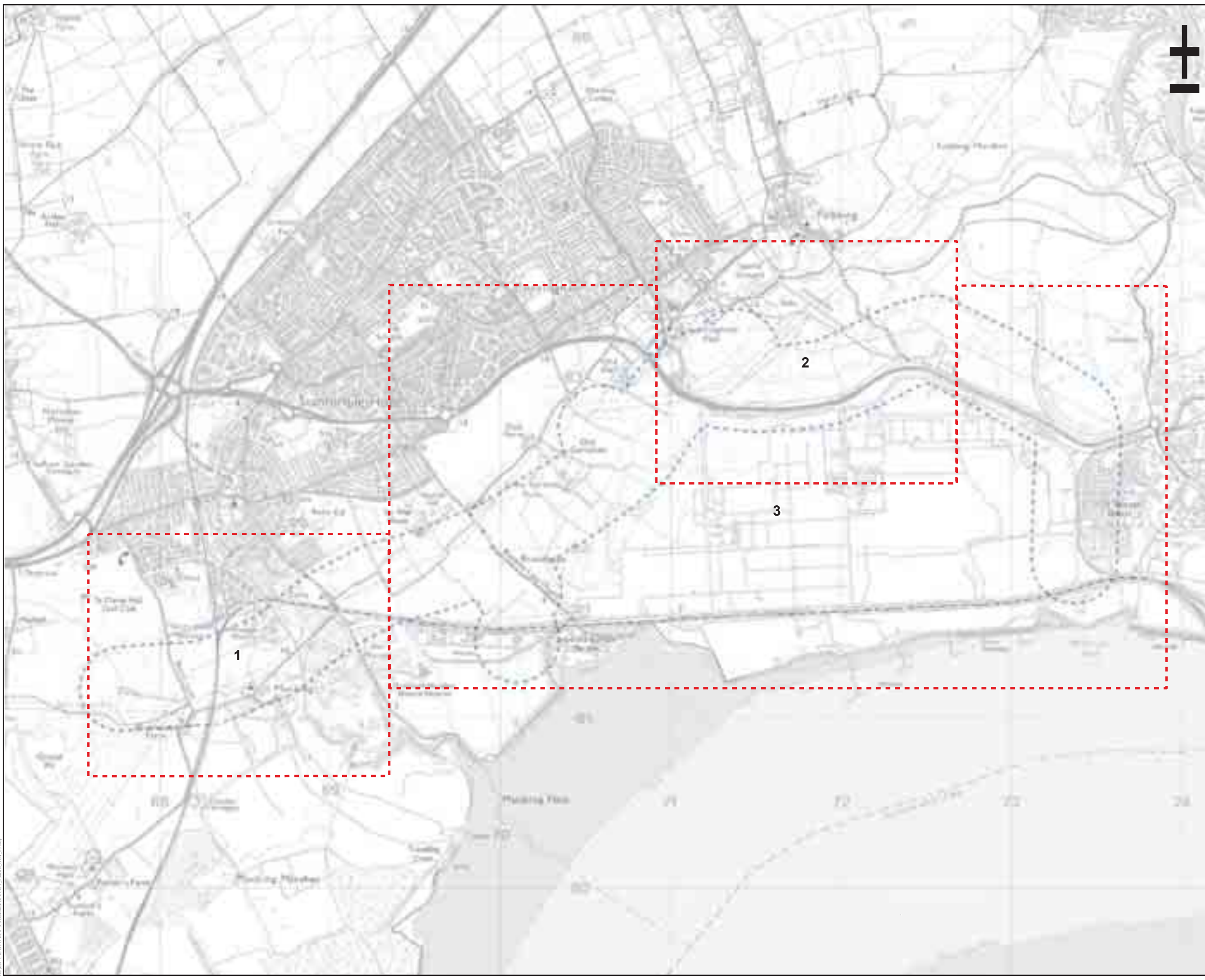
Tel: 020 7337 1700 Fax: 020 7337 1701

Drawing Number: 63958A_BB_SA

Rev

FIGURE 2: SURVEYED AREAS



Notes

Total Survey Area

Breeding Bird Survey Area

0 100 200 300 400 500
Metres

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Gateway Energy Centre

Drawing Title: Breeding Birds Study Areas

Scale at A3: 1:20,000

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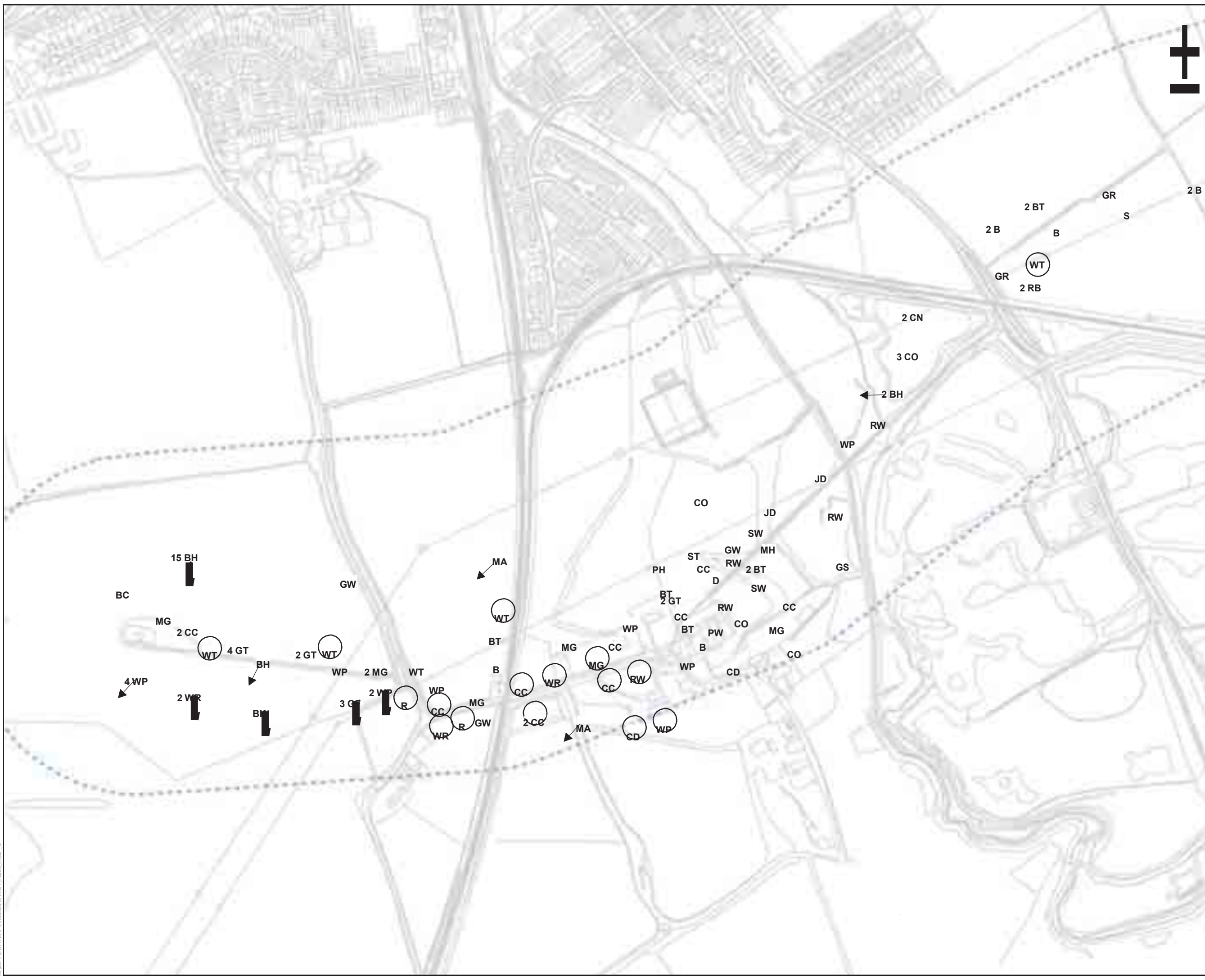
FIGURE 3: BREEDING BIRD SURVEY 2010



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Notes

Total Survey Area

Flight Direction

ä Calling

(X) Singing

Note: Species codes provided on the cover sheet

0 50 100 150 200
Metres

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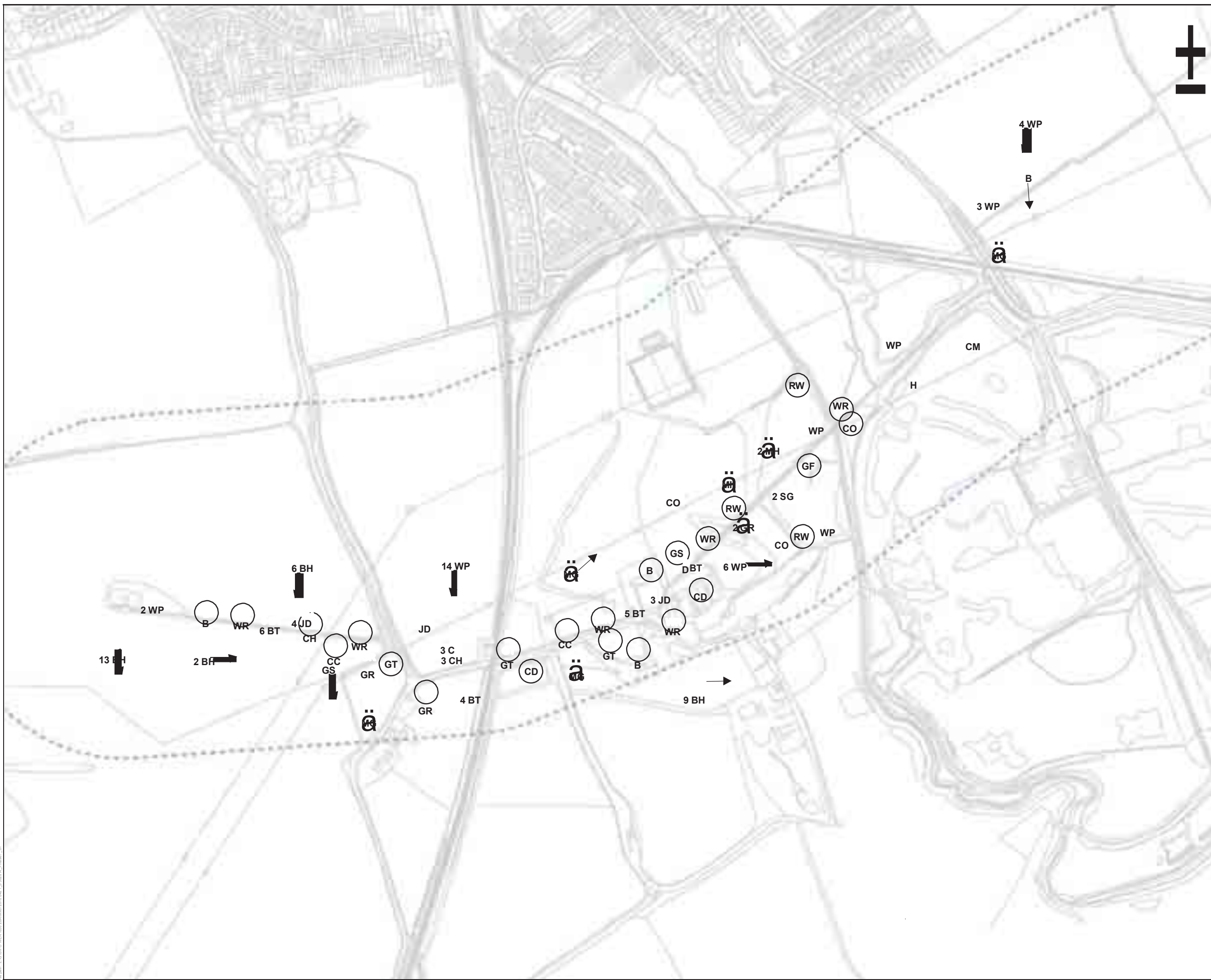

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- Total Survey Area
- Flight Direction
- ä Calling
- (X) Singing

Note: Species codes provided on the cover sheet

0 50 100 150 200
Metres

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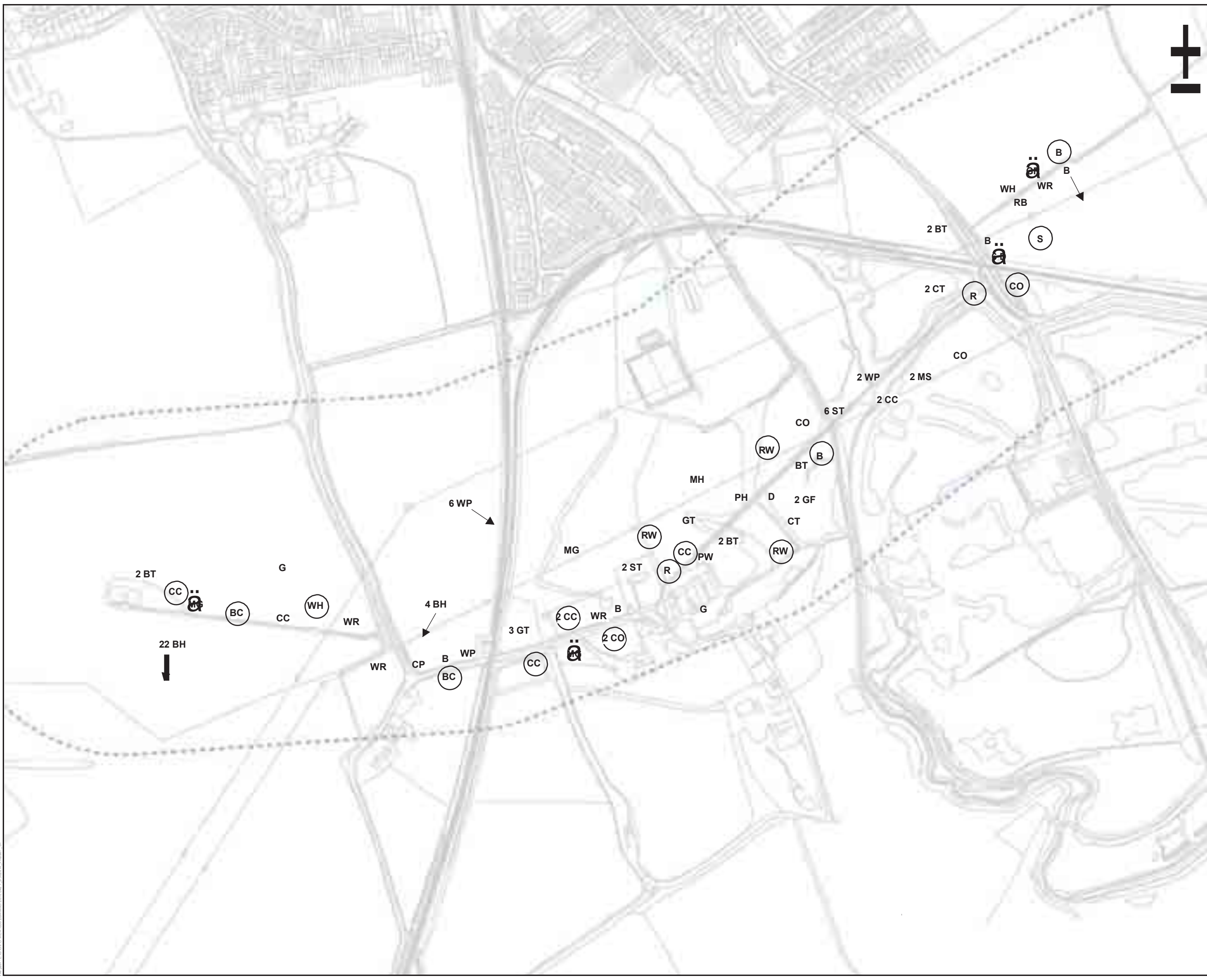

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Total Survey Area
Flight Direction
ä Calling
(X) Singing

Note: Species codes provided on the cover sheet

0 50 100 150 200
Metres

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Drawing Status
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Job Title
Gateway Energy Centre

Drawing Title
Breeding Birds Survey
24th June 2010

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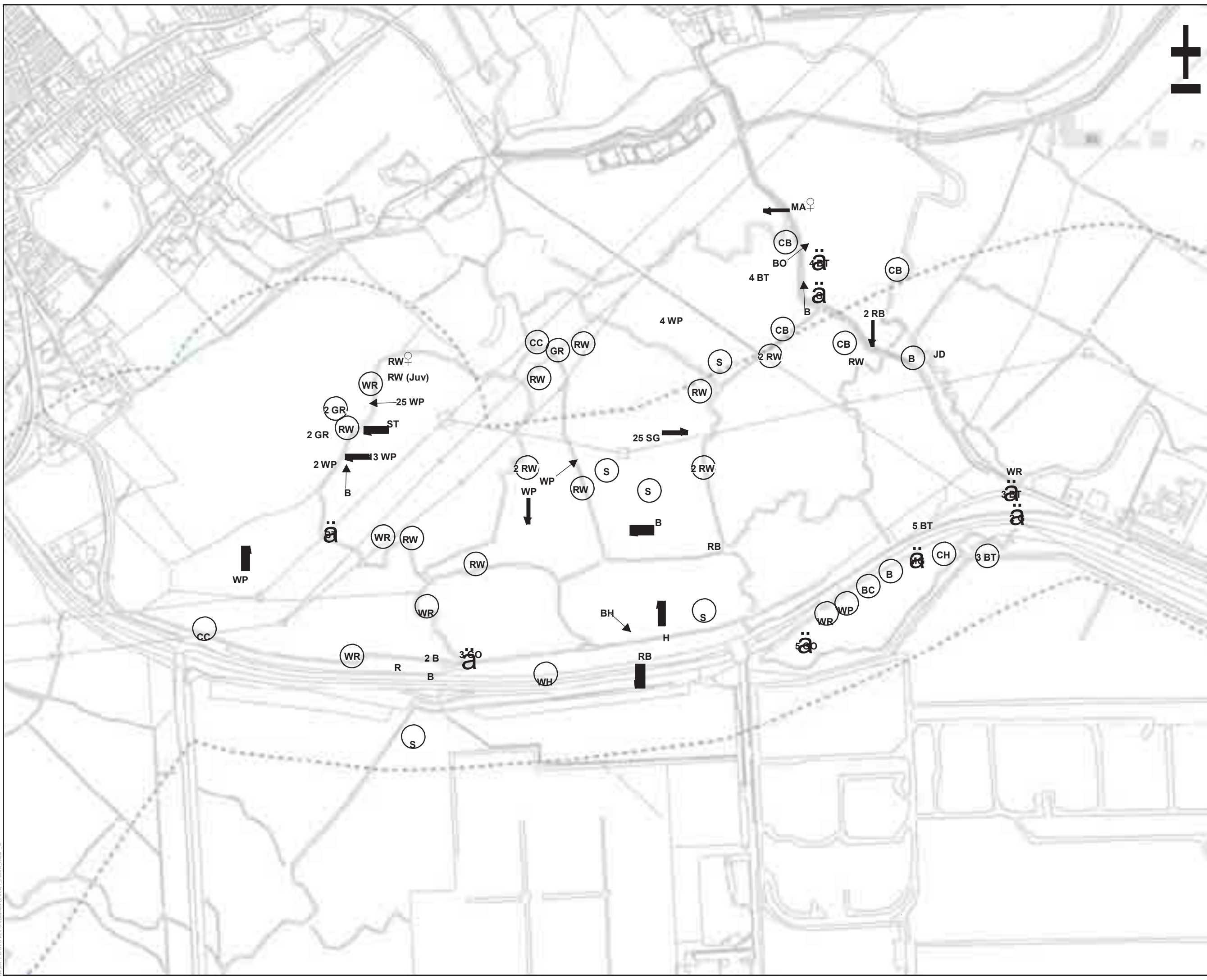

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Notes

Total Survey Area

Flight Direction

ä Calling

(X) Singing

♀ Female

(Juv) Juvenile

Note: Species codes provided on the cover sheet

0 50 100 150 200
Metres

Copyright

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Job Title: Gateway Energy Centre

Drawing Title: Breeding Birds Survey 26th April 2010

Scale at A3	1:5,000		
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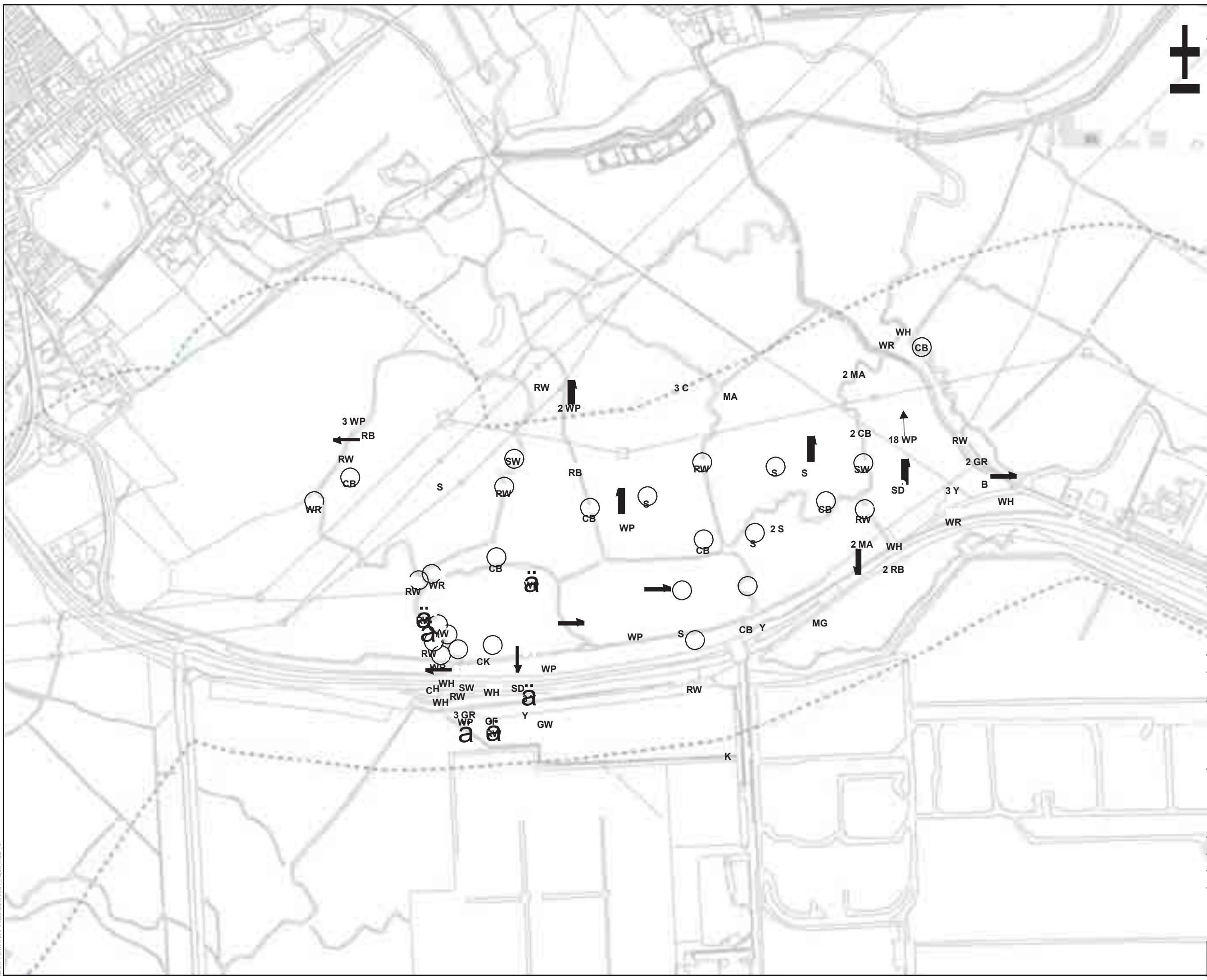

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- Total Survey Area
- Flight Direction
- ä Calling
- (X) Singing

Note: Species codes provided on the cover sheet

0 50 100 150 200
Metres

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Job Title: Gateway Energy Centre

Drawing Title: Breeding Birds Survey 12th May 2010

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Stage 1 check	Stage 2 check	Originated	Date 01/09/2010

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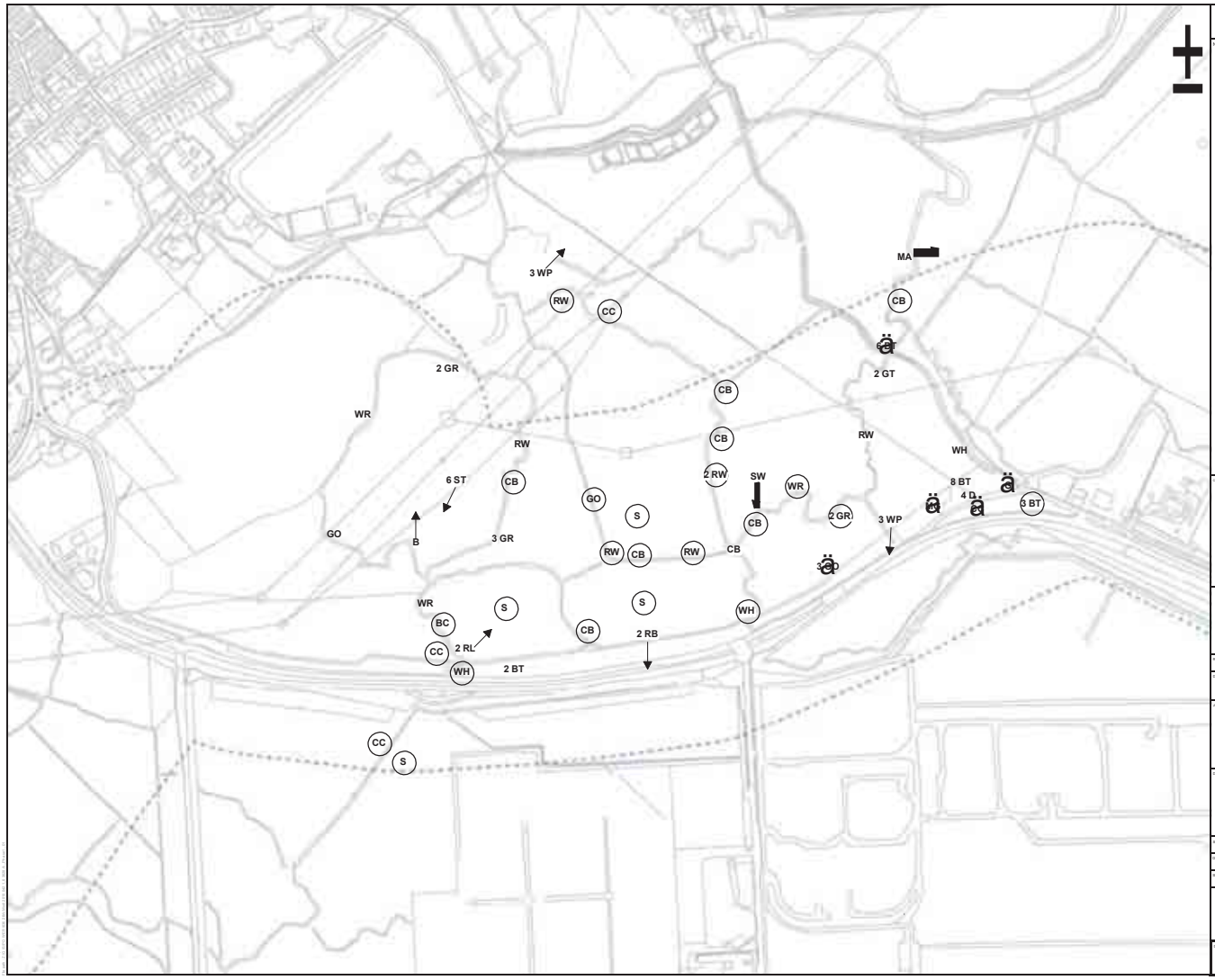

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Notes

Total Survey Area

Flight Direction

Calling

Singing

Note: Species codes provided on the cover sheet

0 50 100 150 200 Metres

Revision Details	By	Date	Check

Drawing Status

FINAL

Job Title

Gateway Energy Centre

Drawing Title

Breeding Birds Survey
23rd June 2010

Scale at A3	1:5,000	
Drawn	JL	Approved TM
Stage 1 check	Stage 2 check	Orig size last

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Drawing Number

63958A_BB_06

Rev

APPENDIX A

A LIST OF THE BIRDS INCIDENTALLY RECORDED DURING THE PHASE 1 HABITAT WALKOVER SURVEY

Latin Name	Common Name	Conservation Status	UK BAP	NERC (S41)	Bonn App 2	Bern App 2
Aegithalos caudatus	Lond Tailed Tit					
Alauda arvensis	Sky Lark	Red	X	X		
Anas platyrhynchos	Mallard					
Ardea cinerea	Grey Heron				X	
Branta canadensis	Canada Goose					
Carduelis chloris	Green Finch					
Charadrius hiaticula	Ringed Plover					
Columba livia	Rock Dove					
Columba oenas	Stock Dove	Amber				
Columba palumbus	Wood Pigeon					
Tyto alba	Barn Owl	Amber				
Corvus corone	Carrion Crow					
Corvus monedula	Jackdaw					
Cuculus canorus	Cuckoo	Red	X			
Cyanistes caeruleus	Blue Tit					X
Cygnus olor	Mute Swan				X	
Delichon urbicum	House Martin	Amber				X
Dendrocopos major	Great Spotted Woodpecker					X
Egretta garzetta	Little Egret					X
Emberiza calandra	Corn Bunting	Red	X	X		
Emberiza citrinella	Yellowhammer	Red	X	X		X
Emberiza schoeniclus	Reed Bunting	Amber	X	X		X
Erithacus rubecula	Robin					X
Fringilla coelebs	Chaffinch					
Fulica atra	Coot					
Gallinago gallinago	Snipe	Amber			X	
Garrulus glandarius	Jay					
Hirundo rustica	Barn Swallow	Amber				X
Hirundo rustica	Swallow	Amber				X
Larus argentatus	Herring Gull	Red				
Larus canus	Common Gull	Amber				
Larus fuscus	Lesser Black-back Gull	Amber				

Latin Name	Common Name	Conservation Status	UK BAP	NERC (S41)	Bonn App 2	Bern App 2
Larus marinus	Great Black-back Gull	Amber				
Larus ridibundus	Black Headed Gull	Amber				
Motacilla cinerea	Grey wagtail	Amber				X
Parus major	Great Tit			X		X
Passer domesticus	House Sparrow	Red	X	X		
Phasianus colchicus	Pheasant					
Pica pica	Magpie					
Picus viridis	Green Woodpecker	Amber				X
Prunella modularis	Dunnock	Amber				
Riparia riparia	Sand Martin	Amber				X
Saxicola torquatus	Stonechat					
Streptopelia decaocto	Collared Dove					
Sturnus vulgaris	Starling	Red	X	X		
Sylvia atricapilla	Black Cap					
Sylvia communis	White Throat	Amber				
Troglodytes troglodytes	Wren					X
Turdus merula	Blackbird					
Turdus philomelos	Song Thrush	Red				

APPENDIX G

SUPPORTING TRANSPORT AND INFRASTRUCTURE STUDIES / INFORMATION

G. SUPPORTING TRANSPORT AND INFRASTRUCTURE STUDIES / INFORMATION

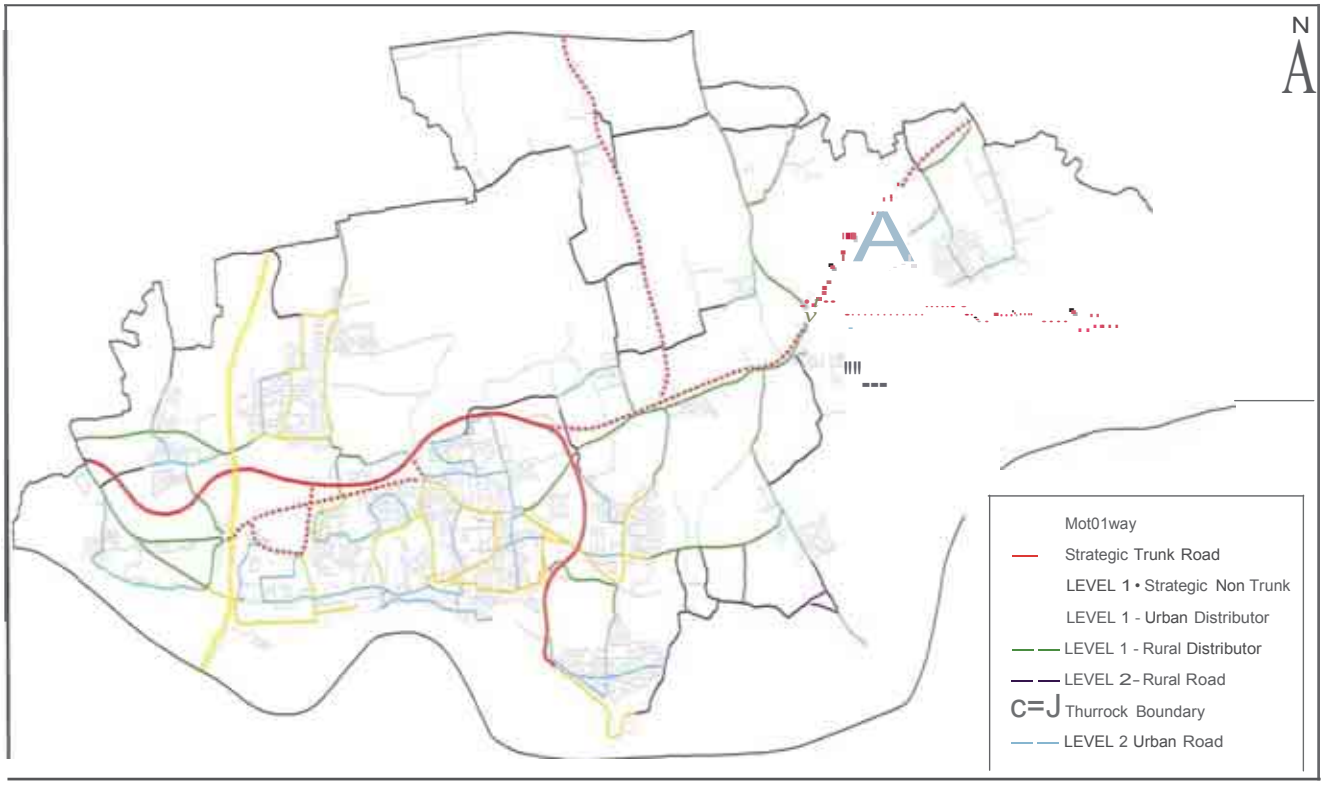
Contents

Supporting Transport and Infrastructure Information is provided in this Appendix.

G.1 Thurrock Route Hierarchy Map

G.2 Highways Agency's "*Aide Memoire for notification requirements for the movement of Abnormal Indivisible Loads or vehicles when not complying with The Road Vehicles (Construction and Use) Regulations 1986*"

G.1 Thurrock Route Hierarchy Map



THURROCK COUNCIL

www.thurrock.gov.uk

MAP 2 - ROAD NETWORK HIERARCHY

G.2 Highways Agency's "*Aide Memoire for notification requirements for the movement of Abnormal Indivisible Loads or vehicles when not complying with The Road Vehicles (Construction and Use) Regulations 1986*"

Aide Memoire for notification requirements for the movement of Abnormal Indivisible Loads or vehicles by road when not complying with The Road Vehicles (Construction and Use) Regulations 1986 (commonly known as C & U)

Weight

Gross weight of vehicle carrying the load exceeding C & U limits up to 80,000kgs (78.74 tons)	2 clear days notice with indemnity to Highway and Bridge Authorities.
Gross weight of vehicle carrying the load exceeding 80,000kgs up to 150,000kgs (147.63 tons)	2 clear days notice to Police and 5 clear days with indemnity to Highway and Bridge Authorities.
Gross weight of vehicle carrying the load exceeding 150,000kgs (147.63 tons)	HA Special Order* plus 5 clear days notice to Police and 5 clear days notice with indemnity to Highway and Bridge Authorities

Width

Width exceeding 2.9m (for C & U loads) 3.0m (9ft 1Oins) up to 5.0m (16ft 5ins) for other loads	2 clear days notice to Police
Width exceeding 5.0m (16ft 5ins) up to 6.1m (20ft)_	HA form VR1** plus 2 clear days notice to Police
Width exceeding 6.1m (20ft)	HA Special Order* plus 5 clear days notice to Police and 5 clear days notice with indemnity to Highway and Bridge Authorities

Length

Length exceeding 18.65m (61ft 2in) up to 30.0m (98ft 5ins) rigid	2 clear days notice to Police
Vehicle combination exceeding 25.9m (85ft)	2 clear days notice to Police
Length exceeding 30.0m (98ft 5ins) rigid. NB For some very light loads, such as yacht masts, that are moved on conventional motor vehicles not exceeding 12 tonnes gross weight or trailers not exceeding 10 tonnes gross weight, an HA Special Order* will be required if the rigid length exceeds 27.4m (89' 11")	HA Special Order* plus 5 clear days notice to Police and 5 clear days notice with indemnity to Highway and Bridge Authorities.

NOTE 1 'Clear days Notice' excludes Saturdays, Sundays or a public holiday in any part of Great Britain in relation to movements authorised by the Special Types General Order only, there being no such exclusion in Special Orders unless specifically stated.

NOTE2 There is no statutory limit governing the overall height of a load, however, wherever possible it should not exceed 4.95m (16ft 3ins) in order that the maximum use can be made of the motorway and trunk road network.

Application form BE16 can be downloaded from our website at www.esdal.com and e-mailed, faxed or posted to the address below. They cannot be completed and submitted online at present, but we hope to be able to offer this facility shortly. Approval is not automatic, and is at the discretion of the Highways Agency Abnormal Indivisible Loads Team acting on behalf of the Secretary of State for Transport. To ensure that the necessary clearances can be obtained in good time from the Police, Highway and Bridge Authorities, you should request permission for the move by returning the completed form 10 weeks prior to the scheduled date of the move. In fact you cannot apply too early and we invite manufacturers or hauliers to contact us at pre tender stage, before making a financial commitment to supply the load, to check whether permission would be granted.

Application form VR1 can be downloaded from our website at www.esdal.com but must not be e-mailed or faxed because the VR1 form is a legal document and so we must receive the original. Approval is not automatic, and is at the discretion of The Highways Agency Abnormal Indivisible Loads Team acting on behalf of the Secretary of State for Transport. To ensure that the necessary formalities can be completed in good time, you should request permission for the move by posting the completed form 2 weeks prior to the date of the scheduled move. Again, you cannot apply too early, and we invite manufacturers or hauliers to contact us at pre tender stage, before making a financial commitment to supply the load, to check whether permission would be granted.

All enquiries to:
Highways Agency
Abnormal Loads Team
C6
5 Broadway
Broad Street
Birmingham B15 1BL

E-mail: abnormal.loads@highways.gsi.gov.uk
Tel: 0121 678 8068
Fax: 0121 678 8569

APPENDIX H

LG LOGISTICS AND BUSINESS PARK OPA CONDITIONS

H. LG LOGISTICS AND BUSINESS PARK OPA CONDITIONS

Contents

The OPA Conditions for the LG Logistics and Business Park are provided in this Appendix. It should be noted that similar provisions exist in the HEO Conditions for the LG Port.

H.1 LG Logistics and Business Park OPA Conditions

H.1 LG Logistics and Business Park OPA Conditions

AnnexA

1. No part of the development hereby permitted shall be commenced until details of siting, design, external appearance of the proposed buildings, and landscaping (hereinafter called the Reserved Matters) in respect of that part of the development have been submitted to and approved in writing by the Local Planning Authority, and the development shall not be carried out otherwise than in complete accordance with the details so approved. Application for the approval of the reserved matters for the first stage of development shall be made to the local planning authority before the expiration of three years from the date of this permission.

2. The development hereby permitted must be begun either before the expiration of five years from the date of this perr:rission,- or before the expiration of two years from the date of the approval of the'last of the reserved matters for the first stage of development, whichever is the later.

3. No development apart from (a) the access roads permitted in this permission (or any permitted variation to it) or ancillary highways works, (b) landscaping works, (c) ecological mitigation works, (d) the provision or diversion of services and service media, (e) the creation or diversion of footpaths, or (f) acoustic mitigation works shall take place on land outside the site of the Shell Haven Refinery designated for refinery expansion as the same is shown on the attached Chetwood Associates plan AO 1156-247C.

4. No development apart from (a) the access roads permitted in this permission (or any permitted variation to it) or ancillary highways works, (b) landscaping works, (c) ecological mitigation works, (d) the provision or diversion of services and service media, (e) the creation or diversion of footpaths, or (f) acoustic mitigation works shall take place on any land coloured green on the attached Chetwood Associates plan AO 1156-247C.

5. The development hereby approved shall be carried out in accordance with the development parameters at paragraph 3.10.1 and Appendix A (with the exception of car parking standards) of the Architectural Design and Sustainability Guide (CD 640) (which forms part of the application).

6. No building within the defined zones illustrated on the Concept Masterplan Height Zoning Plan reference A01156-181 (Architectural Design and Sustainability Guide, Appendix C) (Annex 1 of APP/0/131) shall exceed the heights for each zone as specified on the plan.

7. Prior to the commencement of development of each part of the development for which Reserved Matters haVe been approved, details and samples of all materials to be used in the construction of the external surfaces of the buildings and any external plant and equipment shall be submitted to and approved in writing by the Local Planning Authority and the development shall be implemented using the approved materials.

8. Notwithstanding the provisions of the Town and Country Planning (General Permitted Development) Order 1995 (as amended) (or any order revoking and re-enacting that Order with or without modification), and before the commencement of each part of the development for which Reserved Matters have been approved, a scheme showing full details of fences, walls, gates or other means of enclosure shall be submitted to and approved in writing by the Local Planning Authority, and thereafter these works shall only be undertaken in accordance with such approval.

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9. Fences, walls, gates or other means of enclosure of the application site shall not be higher than 3 metres above the adjacent ground level.

10. No manufacturing, fabrication or other industrial process shall take place outside the confines of any buildings on the site unless otherwise agreed in writing by the Local Planning Authority.

11. Notwithstanding the provisions of the Town and Country Planning (General Permitted Development) Order 1995 (or any order revoking and re-enacting that Order), any oil and other chemical storage tanks, buildings, ancillary handling facilities, filling, drawing and overflow pipes shall be enclosed within an impervious bunded area of at least 110% of the tank capacity, a scheme for which shall be submitted to and approved in writing by the Local Planning Authority. The scheme as approved shall be fully implemented before the relevant part of the development to which a Reserved Matters approval relates is first occupied or brought into use.

12. Notwithstanding the provisions of the Town and Country Planning (General Permitted Development) Order 1995 (as amended) (or any order revoking and re-enacting that Order with or without modification) no additional floor space by way of extension or the insertion of a mezzanine floor shall be added to any building without the prior written approval of the Local Planning Authority.

13. Office (81(a)) uses permitted within the application site shall be used for purposes ancillary to the main uses of the development approved (whether 81(b)/81(c), 82 or 88 of the Use Classes Order 1987 (as amended) (or any equivalent class within an order revoking and re-enacting that Order with or without modification)) and shall not be occupied separately.

14. 1n relation to the Class A1 uses of the Use Classes Order 1987 (as amended) (or any equivalent class within an order revoking and re-enacting that Order with or without modification) proposed on site pursuant to this permission, no individual retail unit shall have a gross floor area in excess of 900 square metres, and the total gross floor area of such A1 uses on the application site shall not exceed 1,500 square metres.

15. Notwithstanding the provisions of Article 3 and Class A1 of the Schedule to the Town and Country Planning (Use Classes) Order 1987 (as amended) (or any equivalent class within an order revoking and re-enacting that Order with or without modification), none of the Class A1 floor space shall be used for the sale of furniture, clothing, fashion or footwear items or household electrical goods.

16. In relation to the Class A2 uses of the Use Classes Order 1987 (as amended) (or any equivalent class within an order revoking and re-enacting that Order with or without modification) proposed on site pursuant to this permission, no individual unit shall have a gross floor area in excess of 900 square metres, and the total gross floor area of such A2 uses on the application site shall not exceed 1,500 square metres.

17. In relation to the Class A3 uses of the Use Classes Order 1987 (as amended) (or any equivalent class within an order revoking and re-enacting that Order with or without modification) proposed on site pursuant to this permission, no individual unit shall have a gross floor area in excess of 750 square metres, and the total gross floor area of such A3 uses on the application site shall not exceed 1,250 square metres.

18. In relation to the Class C1 uses of the Use Classes Order 1987 (as amended) (or any equivalent class within an order revoking and re-enacting that Order with or without modification) proposed on site pursuant to this permission, the use shall be restricted to that of "hotel" within the Use Classes Order 1987 (as amended) (or any equivalent class within an order revoking and re-enacting that Order with or without modification) and shall not be used for any other use within Class C1.

19. In relation to Class 02 uses within the Use Classes Order 1987 (as amended) (or any equivalent class within an order revoking and re-enacting that Order with or without modification) proposed on site, such uses shall be restricted to uses falling within Class D2(e) only within the Use Classes Order 1987 (as amended) (or any equivalent class within an order revoking and re-enacting that Order with or without modification) and shall not be used for any other 02 use. The total gross floor space for Class 02(e) uses shall not exceed 3,500 square metres.

20. Any retail use or sales from buildings in 81, 82 or 88 use shall be ancillary to those uses.

21. Prior to its construction, details of any estuary viewing area shall be submitted to and approved in writing by the Local Planning Authority. The estuary viewing area shall be constructed in accordance with the approved details.

22. No development other than site clearance and preparation shall commence until full details of the scope and arrangement of the proposed foundation design, including methods of piling, final ground levels, and all other new groundworks have been submitted to and approved in writing by the Local Planning Authority. The development shall be carried out in accordance with the approved details.

23. The detailed mitigation measures set out in the OPA Environmental Statement [CD 613] submitted with the application shall be implemented in accordance with the specified provisions of the mitigation strategy including timing, unless provided for by any other condition or agreement attached to this permission, or otherwise agreed in writing with the Local Planning Authority.

24. For ten years after the date of commencement of the development no permanent building, engineering or other development (excluding landscaping, utilities, drainage, rail connections or road access) other than as part of a port shall be carried out in the hatched strip on the plan no AO 1156- (Annex 3 of APP/0/131). This condition shall expressly not preclude rail or road access and connection to and across the Thameshaven branch railway line and to the land south of the existing railway line.

25. With each application for approval of Reserved Matters a detailed survey of existing ground levels, details of any proposed landraising, the final ground level of the development and the finished floor level of the building(s} shall be submitted. The works shall be carried out in accordance with the details approved.

26. Prior to the occupation of any part of the development for which Reserved Matters have been approved for 81(b)/81(c), 82 or 88 uses, details of all external storage of any goods, machinery or materials to be stored anywhere on the site (including the location and height of such storage) shall be submitted to and approved in writing by the Local Planning Authority and the development shall be carried out in accordance with the written approval.

27. Prior to the commencement of development of each part of the development for which Reserved Matters have been approved, drawings showing both foul and surface water drainage (including the provision of oil interceptors) connected with the development shall be submitted to and approved in writing by the Local Planning Authority, and thereafter the works shall only be undertaken in accordance with the approval. The works approved shall be completed prior to the occupation of the first building pursuant to a Reserved Matters approval on the site.

28. No development pursuant to any Reserved Matters approval shall take place until a scheme for any interference or diversion of watercourses and/or land drainage attenuation measures in relation to off-site roads for which approval is sought have been submitted to and approved in writing by the Local Planning Authority

29. Prior to the commencement of development of each part of the development for which Reserved Matters have been approved details of a temporary drainage scheme, including the number and location of proposed oil and petrol interceptors, shall be submitted to and approved in writing by the Local Planning Authority. Thereafter, no development shall commence until the temporary drainage scheme has been constructed and made operational to the site in respect of each Reserved Matters approval plot. The approved scheme for each Reserved Matters approval plot shall be maintained in an operational state during the construction process until its replacement by an approved permanent scheme for site drainage is secured.

30. No development other than site clearance and preparation shall commence until a scheme for the monitoring of all drainage outfalls at the point where they exit the application site has been submitted to and approved in writing by the Local Planning Authority and the development shall thereafter be carried out in accordance with the approved scheme.

31. No development other than site preparation works shall commence until:

- a flood risk assessment based on the indicative Masterplan of the effect of the proposals upon the land in the ownership of 8P, as shown on the Plan attached as Annex 4 of APP/0/131, has been submitted to and approved in writing by the Local Planning Authority; and

- any flood risk prevention measures set out in the flood risk assessment agreed to be necessary to correct additional adverse flood risk (if any) over and above the existing flood risk arising as a result of the development have been completed.

32. The site shall be promoted for development generating rail freight, and for a period of at least ten years from the date of this permission, no development shall take place in an area comprising not less than 50ha of the land situated within a zone 300 metres from (a) the Thameshaven branch line (the boundary of which land is shown delineated by a dotted line marked "Indicative 300m zone – 50ha" on the drawing number 1156-5050) or from (b) the common user siding, without provision having been made for rail access to the national rail network via the Thameshaven branch line (whether directly or through the common user siding). No development shall take place within the site which would prejudice the provision of such rail access.

33. CONDITION DELETED - OBJECTIVES MERGED WITH CONDITION 32.

34. Prior to the occupation of 400,000 sq m GEA of buildings in 88 use, a single common user siding shall be provided within the development site to service the development, together with hardstanding and facilities that can accommodate the rail freight movements generated by the 88 uses on the site, in accordance with a scheme to be submitted to and approved in writing by the local planning authority.

35. The Reserved Matters submitted shall include details which comply with the parking standards in Annex 7 of APP/0/131 and development shall be carried out in accordance with those standards.

36. Parking spaces shall be made available for use during the whole of the time that any part of a building is open to the staff employed within the building or to persons visiting the building in accordance with a scheme to be submitted to and approved in writing by the Local Planning Authority under condition 35 above. A scheme for the provision of priority parking for car sharers and those with a disability shall be incorporated in each Reserved Matters submission and, following approval, the priority parking provision shall be provided in the development in accordance with the approved scheme.

37. No development of any unit of occupation within the development shall commence unless details of loading, unloading and turning space for that unit of occupation have been submitted to and approved in writing by the Local Planning Authority. The development shall be carried out in accordance with the approved details.

38. The access road referred to in conditions 39-44 below shall be constructed in accordance with the standards specified in Appendix A of the Architectural Design and Sustainability Guide (CD/640). Prior to the construction of the highway improvements specified below, access to the site shall be obtained from the Manorway via the existing Shell Oil Refinery Gates 1, 2 or 3.

39. No more than 420,000 square metres of B1(b), 81(c), 82 and 88 development shall be first occupied prior to the completion of the new access road as a single carriageway road (including a cycleway and footway).

40. No more than 868,000 square metres of the 81(b), 81(c), 82 and 88 development shall be occupied prior to the completion of the new access road as a dual carriageway road (including a cycleway and footway).

CONDITIONS RELATING TO THE OPA IN THE EVENT THAT BOTH THE OPA AND HEO ARE IMPLEMENTED

41. For the purposes of the following in-combination conditions the following definitions will apply:

"Berth"= 350m of quay within the area of jurisdiction of the Harbour Authority

"Ro-Ro" = 400m of quay within the jurisdiction of the Harbour Authority

"occupation" (of a berth)= the carrying out of operations within the Port generating revenue from customers from the loading and unloading of commercial cargoes from ships

42. In the event of this development being implemented in combination with the grant of consent for the London Gateway Port Harbour Empowerment Order (to be made) or any Harbour Empowerment Order on land adjacent to the application site then no more than the following combinations of B1(b), B1(c), 82 and 88 and port development shall be first occupied prior to the completion of the new access road as a single carriageway road together with a cycleway, footway and alongside the carriageway the provision for appropriate emergency stacking space for lorries accessing the port and including a Pegasus crossing where the access road crosses diverted footpath 190:

- 377,000 sq m and the Ro-Ro (or 1 berth) or
- 324,000 sq m and the Ro-Ro and 1 berth (or 2 berths) or
- 271,000 sq m and the Ro-Ro and 2 berths (or 3 berths)

43. In the event of this development being implemented in combination with the grant of consent for the London Gateway Port Harbour Empowerment Order (to be made) or any Harbour Empowerment Order on land adjacent to the application site then no more than the following combinations of B1(b), B1(c), 82 and 88 and port development shall be first occupied prior to the completion of the new access road as a dual carriageway road together with a cycleway and footway and including a Pegasus crossing where the access road crosses the diverted footpath 190:

- 825,000 sq m and the Ro-Ro (or 1 berth) or
- 772,000 sq m and the Ro-Ro and 1 berth (or 2 berths) or
- 719,000 sq m and the Ro-Ro and 2 berths (or 3 berths) or
- 666,000 sq m and the Ro-Ro and 3 berths (or 4 berths) or
- 613,000 sq m and the Ro-Ro and 4 berths (or 5 berths) or
- 560,000 sq m and the Ro-Ro and 5 berths (or 6 berths) or
- 507,000 sq m and the Ro-Ro and 6 berths (or 7 berths)

44. Upon the commencement of use of the new access road to the application site for vehicular traffic, all vehicular traffic shall use the new access road and no other means of vehicular access to the application site shall be available for vehicular access (with the exception of emergency vehicles and buses or unless otherwise agreed to in writing by the Local Planning Authority).

45. Prior to the submission of the first reserved matter, details of the alternative means of access to the site for buses and emergency vehicles (including details of access gates and all access points) shall be submitted to and approved in writing by the Local Planning Authority, and thereafter any works to access points or gates shall be completed in accordance with the approved details.

46. Prior to the commencement of development of any part of the application site, a temporary hardstanding for the purpose of delivery and storage of construction materials shall be constructed on site at a location and of materials to be approved in writing by the Local Planning Authority, and the approved hardstanding shall be used at all times for the delivery and storage of materials.

47. CONDITION DELETED

48. No more than 450,000 square metres of the 81(b), 81(c), 82 and 88 development shall be first occupied prior to the completion of the highway works to the A13/A128 junction indicated on figure 6.3a[1] (or such similar works as may be agreed in writing with the Local Planning Authority).

49. No more than 157,000 square metres of the 81(b), 81(c), 82 and 88 development shall be first occupied prior to the installation of a traffic signalisation system at the A13/The Manorway junction as indicated on drawing figure 4.1 (or such similar works as may be agreed in writing with the Local Planning Authority).

50. No more than 300,000 square metres of the 81(b), 81(c), 82 and 88 development shall be first occupied prior to the completion of the highway works to the A13/The Manorway junction indicated on figure 4e revision E (the 4 lane widening) (or such other works as may be agreed in writing by the Local Planning Authority).

[1] Figures referred to in conditions 48-54 are attached to APP/0/131

51. No more than 200,000 square metres of the B1(b), B1(c), B2 and B8 development shall be first occupied prior to the completion of the following works:

(i) Highway works to The Sorrells/A1014 junction as indicated on drawing figure MRW-01 Rev 7H (or such other works as may be approved in writing by the Local Planning Authority); and

(ii) Toucan crossings at Springhouse Road and at The Sorrells junction; and

(iii) Improvements to the two pedestrian subways at the Manorway; and

(iv) The noise mitigation works for the junction in accordance with the drawing attached at Annex 8 of APP/0/131, Drawing 1 of 4 (or such other works as may be approved in writing by the Local Planning Authority)

52. In the event of this development being implemented in combination with the grant of consent for the London Gateway Port Harbour Empowerment Order (to be made) or any Harbour Empowerment Order on land adjacent to the application site then no more than the following combinations of B1(b), B1(c), B2 and B8 and port development shall be first occupied prior to the completion of the highway works to the A13/A128 junction indicated on figure 6.3a (or such similar works as may be agreed in writing with the Local Planning Authority):

(i) 407,000 sq m and the Ro-Ro (or 1 berth) or
(ii) 390,000 sq m and the Ro-Ro and 1 berth (or 2 berths) or
(iii) 373,000 sq m and the Ro-Ro and 2 berths (or 3 berths)

53. In the event of this development being implemented in combination with the grant of consent for the London Gateway Port Harbour Empowerment Order (to be made) or any Harbour Empowerment Order on land adjacent to the application site then

i) no more than 100,000 sq m of the B1(b), B1(c), B2 and B8 development together with the Ro-Ro (or 1 berth) shall be first occupied prior to the installation of a traffic signalisation system at the A13/The Manorway junction indicated on figure 4.1 (or such similar works as may be agreed in writing with the Local Planning Authority) in combination with occupation and/or operation of the Ro-Ro.

ii) No more than the following combinations of B1(b), B1(c), B2 and B8 and port development shall be first occupied prior to the completion of the highway works to the A13/The Manorway junction as indicated on figure 4e revision E (or such other similar works as may be agreed in writing with the Local Planning Authority):

(a) 332,000 sq m of development and the Ro-Ro (or 1 berth); or
(b) 315,000 sq m of development and the Ro-Ro and 1 berth (or 2 berths); or
(c) 298,000 sq m of development and the Ro-Ro and 2 berths (or 3 berths)

54. In the event of this development being implemented in combination with the grant of consent for the London Gateway Port Harbour Empowerment Order (to be made) or any Harbour Empowerment Order on land adjacent to the application site then no more than 157,000 sq m of the 81(b), 81(c), 82 and 88 development shall be first occupied prior to the completion of the following works in combination with the Ro-Ro (or 1 berth):

    i) Highway works to The Sorrells/A1014 junction as indicated on drawing figure MRW-01 Rev?H (or such other works as may be agreed in writing with the Local Planning Authority); and

    ii) The Toucan Crossings at Springhouse Road and The Sorrells junction; and

    iii) Improvements to the two pedestrian subways at the Manorway; and

    iv) The noise mitigation works for the junction in accordance with the drawing attached as Annex 8 of APP/0/131, Drawing 1 of 4 (or such other works as may be agreed in writing with the Local Planning Authority).

    v) The provision of a Sologuard barrier system (or equivalent approved by the local planning authority) on the Manorway to enable the creation of a contraflow traffic system in the event of disruption to the normal operation of traffic on that road.

55. In the event of the development being implemented in combination with the grant of consent for the London Gateway Port Harbour Empowerment Order (to be made) or any Harbour Empowerment Order on land adjacent to the application site then no more than 167,000 sq m of 81(b), 81(c), 82 and 88 development and the Ro-Ro (or 1 berth) shall be first occupied prior to the completion of the construction of the acoustic barriers in accordance with condition 70 in combination with the occupation and operation of the Ro-Ro.

56. In the event of the development being implemented in combination with the grant of consent for the London Gateway Port Harbour Empowerment Order (to be made) or any Harbour Empowerment Order on land adjacent to the application site then no more than the following combinations of 81(b), 81(c), 82 and 88 development and port shall be first occupied prior to the completion of re-surfacing works to provide a low noise road surface (in accordance with a scheme to be submitted to and approved by the Local Planning Authority) to the Manorway between the A13 junction and up to and including The Sorrells junction:

    i) 768,000 sq m and the Ro-Ro and 4 berths (or 5 berths) or
    ii) 384,000 sq m and the Ro-Ro and 5 berths (or 6 berths)

57. The detailed provisions of the Travel Plan (APP/0/104 and APP/0/103) shall be implemented immediately following the commencement of development of the first building of the development hereby permitted.

"\(s8. As part of each Reserved Matters application for premises falling within Use Classes 88, 82, 81(b) and 81(c), written explanation shall be provided setting out the measures to be employed to secure compliance with the provisions of the agreed Travel Plan (APP/0/104 and APP/0/103). No building falling within the specified Use Classes shall thereafter be first occupied until the written approval of the Local Planning Authority to those measures has been received (which shall be consistent with the provisions of the agreed Travel Plan). The Travel Plan measures to form part of the submission shall include but need not be restricted to (where relevant):

- the availability of season ticket loans and any other financial incentives to use means of travel other than the private car
- access to public transport information including real time bus information
- the availability of preferential parking
- the availability of measures for a "guaranteed ride home"
- annual staff travel surveys

59. With each application for approval of Reserved Matters details of the following shall be submitted to the Local Planning Authority and the works shall be carried out in accordance with the approval:

(a) the provision of secure cycle lockers;
(b) provision of cycle cages;
(c) provision of shower facilities;
(d) provision of priority parking for car sharers;
(e) in each building of a size equal to or greater than 1000 sq m, the provision of real time information panels

60. No development shall take place except in accordance with a scheme for the sustainable transport of construction materials onto and off the site which has been submitted to and agreed in writing by the local planning authority.

61. Details of the preferred route to be used for construction traffic shall be submitted to and approved in writing by the Local Planning Authority prior to the commencement of each Reserved Matters approval, and notices shall be erected and maintained throughout the period of construction/development at the site exit, indicating to drivers the route approved by the Local Planning Authority for traffic leaving the site.

62. Prior to the commencement of development of any part of the application site, details of preferred lorry routes, which shall exclude the use of Corringham Road, Lampits Hill, Fobbing Road and Southend Road, access points to the application site and notification of preferred lorry routes to construction lorry drivers that shall be used by construction vehicles during construction shall be submitted to and approved in writing by the Local Planning Authority.

63. Details of on-site parking arrangements during the construction phase will be submitted to and approved in writing by the Local Planning Authority prior to the commencement of each part of the development for which Reserved Matters have been approved, together with details of the proposed management strategy of the developer to prevent any parking of contractors or other parties associated with the construction of the development within any residential areas within Stanford le Hope and Corringham. The Local Planning Authority shall approve the parking management strategy prior to the commencement of development of each Reserved Matters approval, and the strategy shall be implemented accordingly unless otherwise agreed in writing with the Local Planning Authority.

64. All roads, footpaths and verges together with pedestrian and vehicular visibility splays shall be laid out and constructed in accordance with the defined Development Parameters set out at Appendix A of the Architectural Design and Sustainability Guide (CD 640) and shall be constructed in accordance with the details submitted to and approved in writing by the Local Planning Authority pursuant to the relevant Reserved Matters approval.

65. The visibility splays referred to in condition 64 shall at all times be kept clear of any object, vegetation or any other obstructions to visibility in accordance with the height approved as part of the scheme pursuant to condition 64.

66. The access to any individual building plot connecting it to the main internal site roads shall be constructed with an impervious structural base course, together with all related highway drainage works from the main internal site road to the entrance to the building site prior to the commencement of engineering works upon the building site.

67. Before construction of the development hereby permitted, wheel cleansing facilities shall be provided on the site in close proximity to the highway in accordance with details which shall previously have been submitted to and approved in writing by the Local Planning Authority and shall be maintained and used at all times during the construction of the development hereby permitted.

68. As part of the submission of every Reserved Matters application for development on the site, the developer shall submit a Control of Pollution Act Notice under Section 61 for approval in writing by the Local Planning Authority, and the Reserved Matters approval to which it refers shall be carried out accordingly.

69. In respect of each Reserved Matters application and prior to the construction of the access road, a construction management strategy for the management of dust will be submitted to and agreed in writing with the Local Planning Authority to ensure that dust and material created as a result of the construction process do not adversely affect the amenity of those living and working in the area.

70. Prior to the occupation of any buildings permitted, a noise mitigation scheme shall be submitted to and approved in writing by the Local Planning Authority containing details of the construction and maintenance of acoustic barriers in accordance with the four drawings annexed at Annex 8 of APP/0/131 and in conformity with

Highways Agency Standard HA 66/95 "Environmental Barriers Technical Requirements" (or any standard which may supersede or replace it) and no development shall take place except in accordance with the approved scheme.

71. No more than 210,000 square metres of the gross floor space approved shall be occupied before the provision of the acoustic barriers in accordance with condition 70.

72. No plant, equipment or machinery other than as detailed in any Reserved Matters approval shall be installed on the walls or roof of any buildings or on any open part of the site without the prior written permission of the Local Planning Authority.

73. The development permitted hereto shall be carried out in compliance with the OPA Ecological Mitigation and Management Plan (EMMP) (CD 561 and CD 623) (which forms part of the application).

Detailed action plans setting out how the commitments in the EMMP will be implemented will be prepared by the Applicant and submitted to the Local Planning Authority with each relevant Reserved Matters approval, unless otherwise agreed in writing by the Local Planning Authority and the Reserved Matters will thereafter be implemented in accordance with the approved action plans.

75. Prior to the commencement of development an Ecological Advisory Group shall set up and run according to the attached constitution included in Annex 9 of APP/0/131.

76. Prior to the commencement of development on the application site a Construction Environmental Management Plan (CEMP) shall be submitted to and approved in writing by the Local Planning Authority. No works shall take place except in accordance with the approved CEMP.

77. Prior to the submission of the first Reserved Matters for approval, full details of a strategic landscape scheme, including details of the Variable Structural Landscape Zone within the area identified as zone 1A hatched red and the Fixed Landscape Zone identified as zone 1B hatched blue on drawing no A01156-205 (Annex 2 of APP/0/131) which shall comply with the principles set out in the landscape agreement and as repeated in the Architectural Design and Sustainability Guide (CD640 at pages 26 to 28) shall have been submitted to and approved in writing by the Local Planning Authority,(and these works shall be carried out as approved in accordance with a phased fandscape scheme hich shall have been submitted to and approved by the Local Planning Authority (and which will provide for the implementation of the structural landscaping within the Variable Structural Landscape Zone prior to first occupation of any building in the 12 metre height zone shown on drawing no A01156-181 (Annex 1 of APP/0/131) or within 2 years of the commencement of the construction of the first commercial building to be constructed on the application site within the use classes B1, B2 or B8 of the Use Classes Order 1987 (or any equivalent class within an order revoking and re-enacting that Order with or without modification) whichever is the earlier.

78. A landscaping scheme for the Manorway shall be implemented in accordance with details previously submitted to and approved in writing by the Local Planning Authority in accordance with seven drawings annexed at Annex 10 of APP/0/131 at the same time as the acoustic barriers referred to in condition 71.

79. A landscape management plan including long-term objectives, management responsibilities and maintenance schedules for landscape areas included in the strategic landscape scheme referred to in condition 77 above shall be submitted to and approved in writing by the Local Planning Authority prior to the occupation of the development. The landscape management plan shall be carried out as approved.

80. No construction of an individual building under any Reserved Matters approval shall take place until full details of both hard and soft landscape works in respect of that particular plot have been submitted to and approved in writing by the Local Planning Authority. These details shall include existing and proposed ground levels, existing trees and shrubs to be retained, measures for their protection during works, planting species, planting phasing, ground surfacing, fencing, walls and other hard landscaping features.

81. All hard and soft landscape works shall be carried out in accordance with the approved details. The works shall be carried out prior to the occupation of any Reserved Matters plot or in accordance with the programme to be submitted to and approved in writing by the Local Planning Authority.

82. Any tree or shrub specified in a landscape scheme pursuant to conditions of this permission which may die, be removed or be seriously damaged shall be replaced in the first available planting season thereafter and during a period of five years from the first implementation of the approved landscaping scheme or relevant phase of the scheme, unless a variation to the landscaping scheme is agreed in writing by the Local Planning Authority.

83. No development of earthworks shall take place until details of a scheme for any earthworks have been submitted to and approved in writing by the Local Planning Authority. These details shall include the proposed grading and mounding of land including the levels and contours to be formed, showing the relationship of proposed mounding to existing vegetation and surrounding landform. Development shall be carried out in accordance with the approved details.

84. No imported materials shall be used as a growing medium or for any other purpose connected with landscaping on the site prior to a scheme for the chemical testing, treatment, handling and storage of imported materials has been submitted to and approved in writing by the Local Planning Authority. The use of imported materials will thereafter take place in accordance with the approved scheme.

85. Details of all means of external illumination to be provided within the site shall be included as part of each Reserved Matters submission in accordance with the details set out at Appendix A of the Architectural Design and Sustainability Guide (CD 640) and shall be submitted to and approved in writing by the Local Planning Authority. The scheme shall contain details of the height and design of the lighting

columns and lanterns proposed. The installation of any external lighting shall be in accordance with the approved scheme.

86. No development other than development within Use Classes 81, 82 and 88 shall be permitted within the consultation distance, the extent of which is illustrated on the three plans attached at Annex 11 of APP/0/131.

87. No development other than buildings providing for less than 100 occupants and less than three occupied storeys shall be permitted within the inner zone, the extent of which is illustrated on the plan attached at Annex 12 of APP/0/131.

88. Within the area shaded pink on the plan at Annex 13 of APP/0/131, the use of buildings permitted will be restricted to Use Class 88, together with no more than 26,088 square metres (Gross External Area) of buildings in Use Class 82 and no more than 32,031 square metres (Gross External Area) of buildings in Use Class 81(b) or 81(c).

89. Prior to the commencement of development of each part of the development for which Reserved Matters have been approved a site-specific risk-based ground condition assessment of the nature of the subsoils shall be submitted to and approved in writing by the Local Planning Authority. If specific risks to human health or groundwater are identified, then the developer shall submit in writing a scheme designed to deal with potential unremediated contamination within the subject plot, including details of proposed decontamination units and methods of remediating contaminated spoil discovered during construction works, for approval in writing by the Local Planning Authority. Thereafter, all on-site works shall be carried out in accordance with the approved remediation strategy.

90. Prior to the commencement of development of each part of the development for which Reserved Matters have been approved a scheme for the stripping and storage of topsoil and subsoil shall have been submitted to and approved in writing by the Local Planning Authority. The details of the scheme shall include details of the methods to be used to chemically test (and if necessary remediate) the soils together with the methods for their removal, storage, protection and reuse. Thereafter, the stripping and storage of topsoil and subsoil shall be undertaken in accordance with the approved scheme.

91. No development (including groundworks) in relation to any part of the development for which Reserved Matters have been approved shall take place until the developer has secured the implementation of a programme of archaeological work for that site (including any work that might be necessary and practical to preserve remains in situ) in accordance with the Archaeological Mitigation Framework which forms part of the application.

92. Prior to the commencement of development of each part of the development for which Reserved Matters have been approved a detailed design and method statement (including existing and proposed ground levels, layout and depth of all foundations, service trenches, drains, landscaping, ground works, and any revisions of such} for archaeological assessment shall be submitted to and

approved in writing by the Local Planning Authority. Development shall take place in accordance with the approved scheme.

ADDITIONAL CONDITIONS IMPOSED BY THE SECRETARY OF STATE FOLLOWING THE ISSUING OF THE MINDED LETTERS

OPA only development

93. None of the 81(b), 81(c), 82 or 88 uses forming part of the development hereby permitted shall be brought into beneficial use until the following works have been practically completed:

the provision of MOVA or such other equipment providing the same functionality as MOVA equipment to the traffic signals on junction 30 of the M25 together with associated detection and ancillary equipment and road markings; and

ii the provision of either:

(a) a dedicated free flow left slip from the M25 (North) to the A13 (East); or

(b) improvements to the signalisation of the left-tum facility from the M25 (North) to the A13 (East); and

iii improvements to the 3-lane section of the A13 East (westbound) approach on Junction 30 of the M25; and

iv the provision of a 25 metre (approx) flare on the A282 approach; and

v re-marking of the existing A13 West (eastbound) 2-lane approach; and

vi further improvements to the MOVA equipment to accommodate the works referred to in paragraphs 1.2 to 1.5 above; and

vii revised signage and road markings for the A13 link section (M25 Junction 30 to the A126) and associated approaches.

94. No more than 625,000 square metres of floor space of classes 81(b), 81(c) 82 or 88 forming part of the development hereby permitted shall be brought into beneficial use until the following highway works have been substantially completed.

3-lane parallel collector distributor roads either side of the A13, and associated 2-lane slips, taking traffic to and from the A126 via M25 J30; and

ii MOVA signal control (already implemented as part of the interim measures, but extended to cover new improvement elements); and

iii Improvement for traffic from the M25 north to the A13 east at Junction 30 in the form of a left-turn slip road; and

iv Provision of a two-lane signalised left-turn facility from A13 east to the A282 south; and

v Widening of the circulatory carriageways at Junction 30 on the northern (overbridge}, southern (overbridge) and western (underbridge) sections from three to four lanes; and

vi Provision of an additional 2 lanes on the A282 south approach to Junction 30; and

vii Additional flaring on the A13 west approach to Junction 30

in each case as outlined on the Faber Maunsell drawing number W37204_A_8236 together with the implementation of VMS (or an agreed alternative) on the A1012-A1089 section and associated approaches

Supplementary Travel Plan

95. No part of the development hereby permitted shall be brought into beneficial use until the measures in the Travel Plan (APP/0/104 and APP/0/103 as amended and updated by the Supplementary Travel Plan dated October 2006) have been approved by the Local Planning Authority in consultation with the Local Highway Authority and Highways Agency on behalf of the Secretary of State.

Conditions relating to the OPA in the event that both the OPA and HEO are implemented

96. No more than the total amount of 81(b), 81(c), 82 or 88 floorspace set out in the Table below (having regard to the amount of development at the adjacent port permitted by the London Gateway Port Harbour Empowerment Order (to be made} shown in the adjacent column in the Table} shall be brought into beneficial use until the following highway works have been practically completed (meaning complete such that they are operational but excepting minor snagging items). This condition shall not apply in the event that an election is made under a section 278 Agreement entered into with the Secretary of State for Transport that the Works set out below are not to be carried out:

The Works:

3-lane parallel collector distributor roads either side of the A13, and associated 2-lane slips, taking traffic to and from the A126 via M25 J30; and

ii MOVA signal control (already implemented as part of the interim measures, but extended to cover new improvement elements); and

iii Improvement for traffic from the M25 north to the A13 east at Junction 30 in the form of a left-turn slip road; and

iv Provision of a two-lane signalised left-turn facility from A13 east to the A282 south; and

v Widening of the circulatory carriageways at Junction 30 on the northern (overbridge), southern (overbridge) and western (underbridge) sections from three to four lanes; and

vi Provision of an additional 2 lanes on the A282 south approach to Junction 30; and

vii Additional flaring on the A13 west approach to Junction 30

in each case as outlined on the Faber Maunsell drawing number W37204_A_8236 together with the implementation of VMS (or an agreed alternative) on the A1012-A1089 section and associated approaches

The Table·

Column 1 Development at the Port in beneficial use (number of berths)	**Column 2 Maximum amount of permitted 81(b}, 81(c), 82 or 88 floorspace in beneficial use**
1 berth	503,044 square metres with the Ro-Ro (or 579,912 square metres without the Ro-Ro)
2 berths	456,812 square metres with the Ro-Ro (or 533,680 square metres without the Ro-Ro)
3 berths	410,580 square metres with the Ro-Ro (or 487,448 square metres without the Ro-Ro)
4 berths	364,348 square metres with the Ro-Ro (or 441,216 square metres without the Ro-Ro)
5 berths	318,116 square metres with the Ro-Ro (or 394,984 square metres without the Ro-Ro)
6 berths	271,884 square metres with the Ro-Ro (or 348,752 square metres without the Ro-Ro)

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