HORIZON NUCLEAR POWER

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HORIZON NUCLEAR POWER

Horizon Nuclear Power (Wylfa) Ltd.

Consultancy Report:
Dalar Hir

Great Crested Newt Baseline Surveys 2014

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Executive Summary

Jacobs UK Limited (Jacobs) was commissioned to undertake great crested newt (GCN) surveys at land in and around Dalar Hir, Anglesey (centred on NGR SH32989 78381). Dalar Hir was an area of grazing and cultivated land situated to the north of the A55 on the Holyhead Road, northeast of Junction 4. This survey work was in conjunction with potential development of the site. The survey included a background data search, GCN habitat suitability assessments of ponds and presence/absence surveys.

A Habitat Suitability Assessment (HSI) was completed for 18 waterbodies within the site's study area, and a presence / likely absence survey on all except those considered unsuitable. The surveys recorded GCN present in the Central Section of the potential development site. No other waterbodies were found to contain GCN and, although there were limitations on the survey timings, the visits were considered to have straddled the peak breeding season.

The population recorded in the Central Section was isolated from the Northern Section and Southern Section by the presence of two A-roads. The potential for GCN being present in either the Northern or Southern Sections was therefore considered to be negligible based on the results from this survey and a review of the limitations on the survey data.
Further surveys for GCN are not considered necessary at this time but, in line with NRW guidelines, survey data to inform any European Protected Species (EPS) licence should be gathered the same year in which the application is made.

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Contents

1 Introduction

1.1 Overview

Jacobs UK Ltd (Jacobs) was commissioned to undertake great crested newt (*Triturus cristatus*) (GCN) surveys of all water bodies within the boundary of the Dalar Hir site and a 500m buffer zone around the boundary, as shown in figure 1). The site and the buffer zone comprise the study area described in this report.

This work provided baseline data to support a potential future Environmental Impact Assessment (EIA) and planning requirements at the site if required.

The surveys comprised:

- a background data search of waterbodies in the study area;
- initial visit to all ponds identified from the scoping exercise;
- habitat suitability index assessments (HSI); and,
- surveys to determine presence or likely absence of the species.

1.2 Site Description

The site was centred on National Grid Reference SH 32989 78381, and was located to the east of Junction 4 of the A55, Anglesey, North Wales.

The Dalar Hir site covered an area of approximately 24 ha, and largely comprised improved and semi-improved grassland and cultivated fields that were divided by hedgerows. There were also strips of broadleaf woodland plantation on the northern, eastern and southern boundaries of the site. Other habitats present included three ponds and a ditch that flowed from north to south through the centre of the site.

The site was divided into three sections referred to as the Northern, Central and Southern Sections (see figure 1) throughout this report.

The Northern Section is the largest and included the go-cart track at Cartio Mon and associated buildings within the east of the site and the Dalar Hir Farm with associated buildings within the west of the site.

The Central Section was located between the A55 and the road that was parallel to the northern side of the A55 which provides access to Cartio Mon. This area mostly comprises rough grassland, scrub, and also contains a partially dried pond (referred to as Pond 12 in this report).

The Southern Section was the smallest and was located to the south of the A55. This area largely comprised of a pasture field with hedges as field boundaries.

The buffer zone covered an area of approximately 250ha and was largely pasture fields divided by hedgerows and ditch systems. The buffer also included the A55 road, smaller roads, and building complexes.

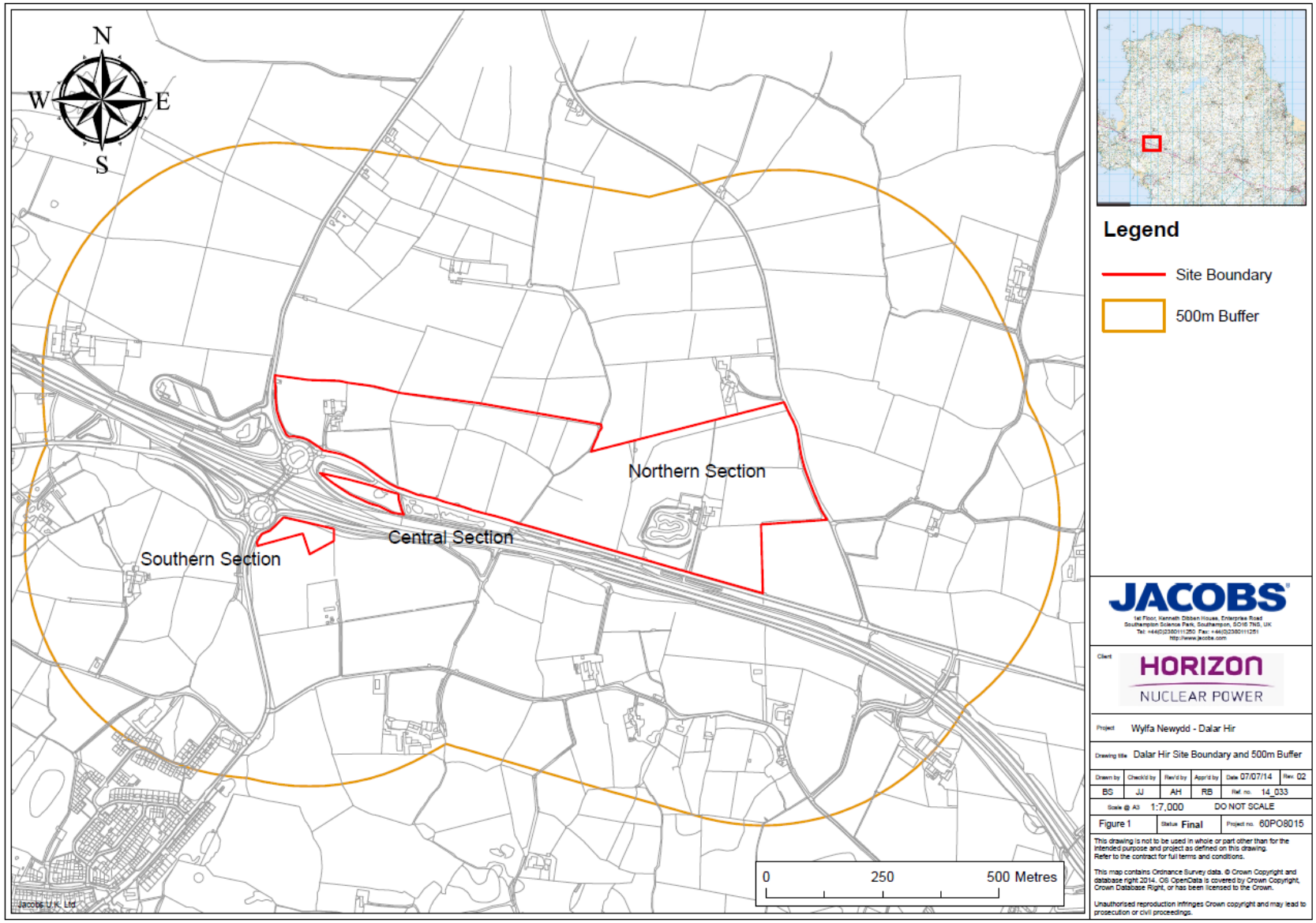

Figure 1: Dalar Hir Site survey area

1.3 Aims and Objectives

The aims of the survey and report were to:

- establish the suitability of all ponds within the study area to support breeding GCN;
- establish presence or likely absence of GCN in the study area;
- report on the findings; and,
- establish the need for further surveys (if required).

1.4 Previous Background Data Searches

A background data search for GCN records was not completed as part of this report. This is because a data search has already been completed as part of the due diligence environmental assessment (Mott MacDonald, 2013) and the extended Phase 1 habitat survey completed in 2013, (Jacobs, 2013) (Application Reference Number: 6.6.17). The results from these are summarised in Section 1.4.1 relating to designated sites for nature conservation within 2 km of the site and Section 1.4.2 relating to GCN records.

1.4.1 Statutory and non-statutory sites and habitats for nature conservation

There were no designated sites within the site boundary. However, one designated site was identified by Mott MacDonald (2013). This was the Llyn Traffwll Site of Special Scientific Interest (SSSI) located 1km to the south of the site. The SSSI has been designated for the small shallow lake that supports an abundance of wildfowl species. The Valley Wetlands Royal Society for the Protection of Birds Reserve was identified as forming a part of the Llyn Traffwll SSSI. The Valley Wetlands was described as having reedbed habitats that supported a number of reedbed special species, e.g. water rail (*Rallus aquaticus*), marsh harrier (*Circus aeruginosus*) and Cetti's warbler (*Cettia cetti*), as well as other wetland species.

1.4.2 Great crested newt and other amphibian records

There were six records from 1999 of GCN within 1km of Dalar Hir Farm (Jacobs, 2013) (Application Reference Number: 6.6.17). The records indicate that the species was found in fields to the north and west of the site boundary. Numerous records of common frog (*Rana temporaria*) and common toad (*Bufo bufo*) were returned in data from Cofnod (North Wales Environmental Information Service) as part of a due diligence report (Mott MacDonald, 2013).

1.5 Previous Survey Work

1.5.1 Due diligence environmental assessment report 2013

In July 2013, Mott MacDonald produced a due diligence environmental assessment report (Mott MacDonald, 2013). The report assessed and highlighted the potential for any foreseeable risks on site that would need to be considered in relation to ground conditions and ecology.

The report presented the findings of a background data search and Phase 1 habitat survey. The survey classified the majority of the site as semi-improved grassland, with smaller areas of improved grassland and some woodland. The survey also found several water bodies and categorised all of the field boundaries.

Evidence of nesting birds was found in a number of outbuildings at Dalar Hir Farm (house sparrow (*Passer domesticus*). This was the only evidence of protected species recorded.

The only other species of note was Japanese knotweed (*Fallopia japonica*). This species is included on Schedule 9 of the Wildlife and Countryside Act, 1981 (as amended) as a non-native invasive species.

1.5.2 Extended Phase 1 habitat survey 2013

In September 2013, Jacobs completed an extended Phase 1 habitat survey and Habitat Suitability Index Assessment (HSI) of ponds to support great crested newt (GCN) at the site (Jacobs, 2013) (Application Reference Number: 6.6.17). The report also included a background data search of designated and non-designated sites for nature conservation, and of protected species records within 1 km of the site boundary.

The surveys found that improved grassland covered the majority of the survey area with semi-improved grassland, marshy grassland, hedgerow and young plantation woodland also widespread, but not forming a significant proportion of the total survey area. The survey identified hedgerows, young plantation, buildings and ponds as having the potential to support protected animal species including:

- badger (*Meles meles*);
- barn owl (*Tyto alba*);
- bats;
- great crested newt;
- reptiles; and,
- water vole (*Arvicola amphibius*).

Further surveys for all these species were recommended.

Specifically relating to GCN were three ponds found within the boundary of the site that were all categorised as being of “average” suitability to support GCN, according to scale applied by Oldham *et al.*, 2000.

A habitat suitability survey of terrestrial habitats was also undertaken as part of the Phase 1 survey 2013 (Application Reference Number: 6.6.17). The survey recorded significant amounts of suitable habitat including:

- hedges and woodland;
- ditches and ponds;
- scattered scrub;
- marshy grassland; and,
- tall ruderal vegetation.

The site was considered suitable for newts in their terrestrial and breeding phases and a further terrestrial habitat assessment will not be required.

Jacobs also confirmed the location of the Japanese knotweed (Mott Macdonald, 2013) and also found a stand of montbretia (*Crocossmia x crocosmiiflora*) which is also listed on Schedule 9 of the Wildlife and Countryside Act, 1981 (as amended). Appropriate management and disposal of these species was recommended.

1.5.3 Previous Presence or Likely Absence Surveys

Jacobs' ecologists met with surveyors from Richards Moorehead and Laing Ltd. on site during the third survey week (*pers comm.* with Mark Jackson, Jacobs). The company has been completing surveys of the complex of balancing ponds since 2010 on behalf of the North and Mid-Wales Trunk Road Agent following improvement works to Junction 4 of the A55. These data were supplied to Jacobs and indicate that a low population was recorded in 2010 and in 2014. These data are discussed further in Section 4.

1.6 Great Crested Newt Ecology

Great crested (or warty) newt is a relatively widespread species across lowland England and Wales. The species is largely absent from upland areas, highly urbanised areas and in areas with a low pond density.

Great crested newt breed between March and June in water and spend a large proportion of the rest of the year on land (their terrestrial phase). They prefer ponds that are small to medium in size that are free of fish and ideally area unshaded so as not to inhibit the growth of aquatic plants upon which they lay their eggs. Populations of GCN in an area may not be loyal to a single pond; this gives rise to meta-population dynamics as a result of individual GCN dispersing between smaller populations.

In their terrestrial phase GCN will move out from breeding ponds to terrestrial habitats suitable for foraging, sheltering and hibernating. Studies have shown that GCN can travel up to 500 m from breeding ponds (Gent, 2003), but are generally found much closer to their natal ponds. Survey guidelines for the species therefore specify that all ponds inside a development boundary or within 500 m of a proposed development boundary that have the potential to support breeding GCN should be surveyed. This is unless they are separated from the development boundary by a significant barrier to dispersal e.g. a major river or road. The survey guidelines therefore identify the risk to GCN in their terrestrial phase in addition to their breeding places.

1.7 Legislation

The great crested newt is fully protected species under all elements of Section 9 of the Wildlife and Countryside Act, 1981 (as amended). It is also protected under Parts 1 and 2 of Regulation 39 of the Conservation of Habitats and Species Regulations, 2010 (as amended). This legislation taken together makes it an offence to:

- deliberately kill, injure or capture (take) a GCN;
- intentionally or recklessly obstruct access to any structure or place used for shelter or protection by a GCN;
- intentionally or recklessly disturb a GCN while it is occupying a structure or place which it uses for that purpose;
- deliberately disturb GCN in such a way as to be likely to significantly affect the ability of a population to survive over time, breed or rear or nurture their young;
- negatively affect the local distribution or abundance of the species; and,
- damage or destroy a breeding site or resting place of a GCN.

A broad definition of 'deliberate' is implied and an offence may be committed by a person who may not intend to kill or capture a GCN but nevertheless performs the relevant action, being sufficiently informed and aware of the consequences his or her action will most likely have. Consequently both the animals and their habitat are protected, and activities that damage or impede the use of this habitat are also prohibited.

If there is a risk of GCN being present within the site boundary then it is likely that a European Protected Species Licence would need to be obtained before any development works could start. This would include a method statement detailing how GCN would be protected by works, and how their overall favourable conservation status will be maintained.

2 Methodology

2.1 Background Data Search of Waterbodies in the Study Area

A background data search was carried out to establish where there may be waterbodies in the buffer zone that should have an initial survey visit. The search used the following information sources:

- aerial photography;
- previous survey results;
- Ordnance Survey mapping; and,
- discussion with Jacobs ecologists who completed surveys in 2013.

These data were brought together and reviewed in order to establish the number of ponds or ditches present, and then the requirement for inclusion within the survey schedule.

2.2 Waterbody Suitability Assessment

Waterbody suitability for breeding GCN was established using a two stage approach. Firstly, ponds were visited to confirm presence and to determine if there were any immediately obvious reasons why a waterbody may not be suitable for GCN. If waterbodies were suitable then an HSI was completed to quantify the suitability.

2.2.1 Initial Visit

The initial visit included eliminating ponds from the survey schedule that were considered unsuitable based on factors that that are directly prohibitive to GCN breeding including:

- ditches that were flowing;
- waterbodies that were polluted; and,
- waterbodies that were dry or virtually dry.

Ponds were visited between 31st March and 4th April 2014 by an experienced ecologist holding a GCN surveyor's licence granted by Natural Resources Wales (NRW) (licence numbers are given in Appendix B).

2.2.2 Habitat Suitability Index (HSI)

An HSI assessment was carried out on ponds that were determined suitable for GCN from the initial visit. The HSI assessment followed the method developed by Oldham et al. (2000), which uses ten suitability indices that are each given a score. All of the indices are factors thought to affect the suitability of a water body for breeding GCN. The ten indices are then converted and combined to give a suitability index of between 0.01 and 1. The ten factors are:

- geographical location;
- pond area;
- pond permanence;
- water quality;
- shade;
- waterfowl;
- fish;

- number of ponds located within 1 km of pond being surveyed;
- terrestrial habitat nearby; and,
- macrophyte cover.

A low HSI score means that the water body is less likely to be suitable for breeding GCN, whereas a higher score would indicate a greater suitability. There are five categories into which suitability is divided, as shown in Table 1.

Table 1: Pond suitability classification

HSI Score	Pond Suitability
< 0.5	Poor
0.5 – 0.59	Below Average
0.6 – 0.69	Average
0.7 – 0.79	Good
> 0.8	Excellent

A low score does not necessarily mean that GCN will be absent from any given pond, and nor does a high score indicate that GCN will be present. The score is useful as a monitoring tool as there are strong correlations between high scores and higher numbers of newts, and the reverse for lower scoring ponds. The information from the HSI analysis is also a requirement of any future European Protected Species Licence application.

The HSI assessment cannot be used for ditches. The suitability of ditches was therefore established by more qualitative means using the experience of the survey team. The main factor in determining the suitability of a ditch for GCN is the presence of flowing water. Where ditches were scoped in or out, full explanations are provided.

2.3 Presence/absence survey

Field surveys were undertaken according to good practice methodology (English Nature, 2001; Froglife, 2001; Langton *et al.*, 2001) including where possible, the deployment of bottle-trapping, egg searching, netting, torching and refuge searching. The standard number of surveys required to determine presence or likely absence is four surveys, which should be completed between March and June, with at least two surveys of each pond being completed between mid-April to mid-May to record the peak of newt breeding activity.

All surveys were led by experienced surveyors in possession of licences to survey for GCN granted by NRW. The surveys were carried out between 2nd April and 5th June 2014. Appendix B provides the exact survey dates for each visit and the licence numbers for the lead surveyors. All surveys took place during appropriate weather conditions; little wind, no rain and temperatures above 5 °C.

2.4 Limitations

Permission to access to the survey area led to the good practice guidance on timing of surveys to coincide with the period mid-April to mid-May being not being followed. A survey visit in the first half of May was achieved at each pond, but the April visit occurred between 7th and 10th April. However, given the ambient temperatures during these April surveys (see appendix C) and their proximity to mid-April, this is not considered to be a significant limitation.

Pond 11b could not be accessed due to health and safety concerns, the pond being separated from the site by a high, barbed wire fence on the western side and by a thick hedge on the eastern side, neither of which could safely be crossed. The pond

was therefore only viewed from a distance of 10m for HSI assessment. The HSI score for the pond was 0.64 (average) and the general appearance of the pond was very shallow indicating a limited potential to support GCN.

Pond 17 could not be accessed due to health and safety concerns as access was hindered by barbed wire fences and the A55 dual carriageway and slip-road.

3 Results

3.1 Desk-based Study of Potential Water Body Locations

Twenty-six ponds were found within the site boundary and the 500m buffer zone around the boundary of the site. The location of all the water bodies surveyed is shown on figure 2 and figure 3. Table 2 gives a summary of the results of the initial surveys.

Table 2: Results of initial survey visits

Pond	Pond Scoped in	Ponds scoped out				
		Access restricted/ H&S concerns	Ponds with barriers to dispersal	Ponds over 500 m from the potential development area boundary	Dry	Ditch with flow
1	X	-	-	-	-	-
2	X	-	-	-	-	-
3	X	-	-	-	-	-
4	-	-	X	-	-	-
5	X	-	-	-	-	-
6	X	-	-	-	-	-
7	-	-	-	-	-	X
8a	-	-	-	-	X	-
8b	X	-	-	-	-	-
9	-	-	-	-	-	X
10	X	-	-	-	-	-
11a	X	-	-	-	-	-
11b	X	X	-	-	-	-
12	X	-	-	-	-	-
13	X	-	-	-	-	-
14	X	-	-	-	-	-
15	X	-	-	-	-	-
16a	X	-	-	-	-	-
16b	X	-	-	-	-	-
16c	X	-	-	-	-	-
16d	X	-	-	-	-	--
17	-	X	-	-	-	-
18	-	-	-	X	-	-
19	-	X	-	-	-	-
20	-	X	-	-	-	-
21	-	X	-	-	-	-

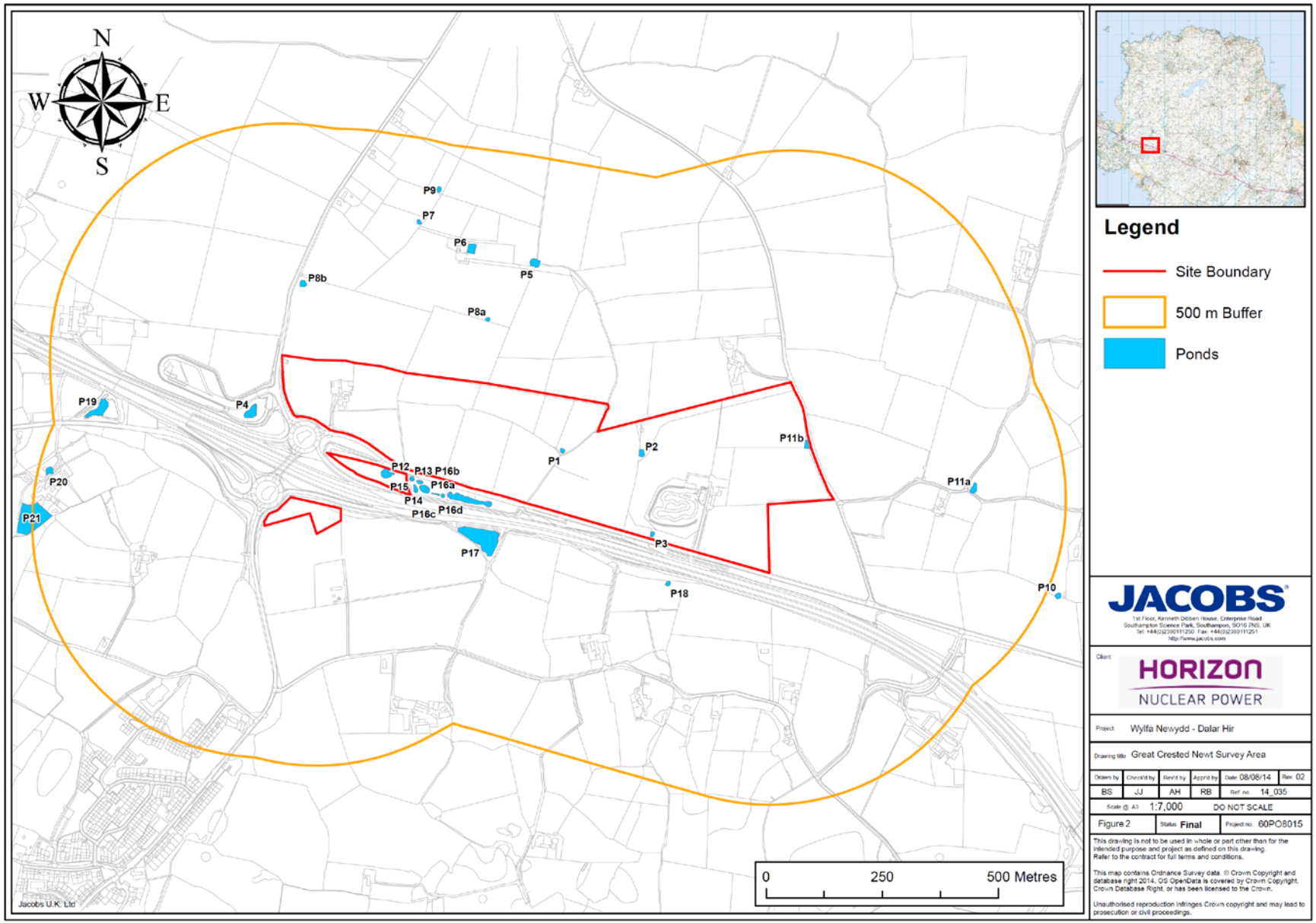

Figure 2: Locations of waterbodies (the complex of ponds in the centre of the site is shown in more detail on Figure 3)

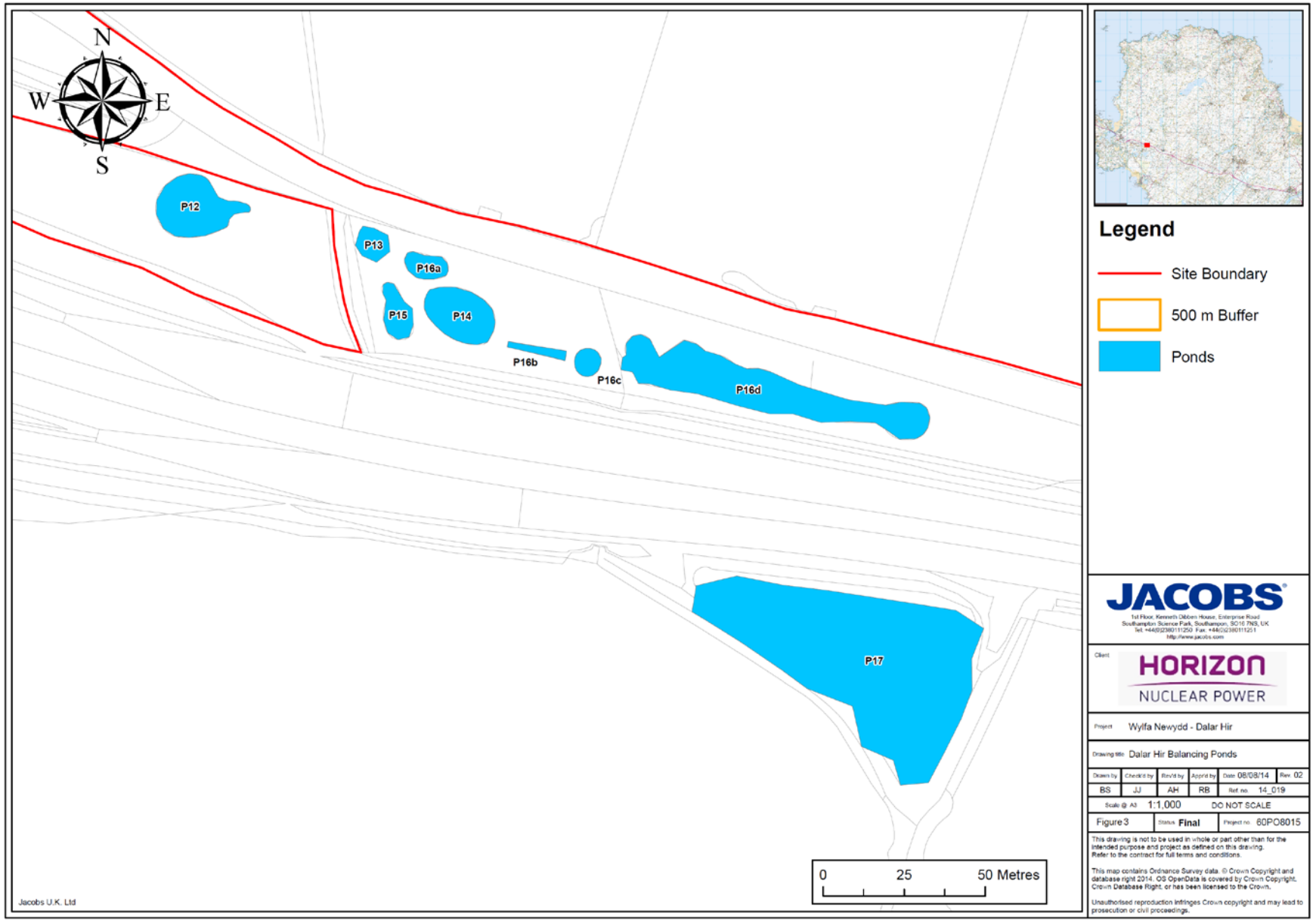

Figure 3: Locations of the complex of ponds in the centre of the site

3.2 Habitat Suitability Index and Scoping Results

All waterbodies that were determined to be suitable were assessed using HSI analysis. The HSI assessment results are summarised in Table 3. Full values for the HSI scores are given in appendix A.

Table 3: Pond survey visit and HSI analysis results

Pond	Ponds scoped in to be surveyed in 2014	
	HSI Score	HSI Rating
1	0.64	Average
2	0.64	Average
3	0.6	Average
4	Not accessed	
5	0.62	Average
6	0.72	Good
7	0.45	Poor
8a	Not present	
8b	0.52	Below average
9	0.58	Below average
10	Not accessed	
11a	0.69	Average
11b	0.64	Average
12	0.39	Poor
13	0.76	Good
14	0.83	Excellent
15	0.74	Good
16a	0.75	Good
16b	0.76	Good
16c	0.66	Average
16d	0.85	Excellent
17	0.53	Below average
18	0.56	Below average
19	Not accessed	
20	Not accessed	
21	Not accessed	

3.3 Pond Descriptions

Habitat descriptions for all ponds are provided below. The descriptions include the justification for inclusion or exclusion from survey for each pond where relevant.

3.3.1 Pond 1

HSI score – 0.64: Rating – Average

Pond 1 was a shallow scrape approximately 2m x 1m in size (see plate 1). The water was shallow and turbid and there was a low coverage of aquatic plants, including duckweed (*Lemna minor*). The pond was located in an arable field next to a hedge.

Plate 1: Pond 1

3.3.2 Pond 2

HSI score – 0.64: Rating – Average

Pond 2 was a shallow, boggy area approximately 5m x4 m in size (see plate 2). There was little visible water as the pond was choked with floating sweet grass (*Glyceria fluitans*). The pond was located in an area of woodland and was surrounded by willows (*Salix* sp.).

Plate 2: Pond 2

3.3.3 Pond 3

HSI score – 0.6: Rating – Average
Pond 3 was approximately 15m x 3m long (see plate 3). There was little visible open water as the pond was choked with common spike rush (*Eleocharis palustris*) and greater reedmace (*Typha latifolia*). The pond was located adjacent to a wall which separated the potential development area from a road. To the north was a strip of broadleaved woodland plantation which would provide excellent foraging habitat for GCN.

Plate 3: Pond 3

3.3.4 Pond 4

Pond 4 was located to the west of the site and was separated from the potential development area by a road. It is considered extremely likely that the road will prevent GCN that may be breeding in Pond 4, from migrating into the development area. The potential impacts on any GCN in Pond 4 were therefore thought to be negligible and no further surveys were carried out.

3.3.5 Pond 5

HSI score – 0.62: Rating – Average
Pond 5 was located to the north of the potential development area and comprised a shallow muddy pond located within willow woodland (see plate 4). The pond area was relatively large (11m x 15m), but the majority of water present was less than 10cm deep. However, there were aquatic plants present, which would be suitable for egg laying by newts. In addition, the pond was located near to hedgerows and scrub, which would provide highly favourable habitat for foraging newts.

Plate 4: Pond 5

3.3.6 Pond 6

HSI score – 0.72: Rating – Good

Pond 6 was located next to a derelict farm building within an area of broadleaved woodland (see plate 5). The pond was 20m x 15m and was heavily shaded. However, there were aquatic plants present with the potential to support egg laying by newts and the water quality was relatively good.

Plate 5: Pond 6

3.3.7 Pond 7

HSI score – 0.45: Rating – Poor

Pond 7 was identified from Ordnance Survey mapping, but was found in the field to be a flowing section of ditch (see plate 6). It is considered unlikely that the ditch would

ever support breeding GCN owing to the flow of water present. Therefore Pond 7 was not surveyed further.

Plate 6: Pond 7

3.3.8 Pond 8a

Pond 8a was identified as a potential pond from Ordnance Survey mapping. The pond was not present during the initial survey and there was no evidence to suggest that a pond would form in this location at other times of year. Pond 8a was therefore scoped out and was not surveyed further.

3.3.9 Pond 8b

HSI score – 0.52: Rating – Below Average
Pond 8b was located to the west of the site next to a cattle corral and a road. The pond was very turbid and eutrophicated with signs of possible pollution. The water quality appeared to be poor and no aquatic invertebrates were observed. The pond banks were comprised of rubble and hardcore with occasional stunted hawthorn (*Craetagus monogyna*) and gorse (*Ulex europeaus*). The surrounding habitat was generally poor and comprised improved grassland. The water quality was considered to be too poor to be likely to support breeding GCN. The pond was therefore scoped out and was not surveyed further.

3.3.10 Pond 9

HSI score – 0.58: Rating – Below Average
Pond 9 was located on the same ditch line as Pond 7 and shared many of the same characteristics. The pond was found to comprise a flowing ditch with no potential to support breeding GCN. Pond 9 was therefore scoped out and was not surveyed further.

3.3.11 Pond 10

Pond 10 was initially identified from Ordnance Survey mapping as being within the 500m buffer zone around the potential development area boundary. However, the initial field survey showed that the pond is actually outside of this buffer zone. The pond is also separated from the potential development area by several large fields,

hedges and a lane. It was therefore considered extremely unlikely that any GCN breeding in Pond 10 would be present within the development boundary in their terrestrial phase. The risk to any GCN breeding in Pond 10 was therefore assessed as being negligible. Pond 10 was subsequently scoped out and was not surveyed further.

3.3.12 Pond 11a

HSI score – 0.69: Rating – Average
Pond 11a was located in the east of the buffer zone around the potential development area. The pond was situated in the corner of a field of improved grassland and was bordered by hedges and roads to the west and south respectively. The pond measured 18m x 7m and was shallow with heavily poached low muddy banks (see plate 7). The water quality varied within the pond with clear water visible from the road side, becoming muddy and very turbid on the field side. There was abundant vegetation suitable for egg laying by newts.

Plate 7: Pond 11a

3.3.13 Pond 11b

HSI score – 0.64: Rating – Average
Pond 11b was located within the potential development area boundary adjacent to the road bordering the eastern fields and was situated between a strip of recently planted broadleaved woodland that was overgrown with bramble (*Rubus fruiticosus agg.*) and a hedgerow. The HSI score for this pond was average and the water depth was also very low and bare mud around the pond showed that it had dried significantly. There was also little vegetation present that was suitable for egg laying by newts.

The pond could not be accessed from the roadside due to the thick vegetation or from the woodland side due to a high barbed wire fence. This resulted in no further surveys being possible for this pond.

3.3.14 Pond 12

HSI score – 0.39: Rating – Poor

Pond 12 was located in the small pocket of land between the A55 and the smaller road to the north. The pond was formed in a deep depression and comprised of a small patch of shallow water choked with soft rush (*Juncus effusus*) (see plate 8). The water quality was very poor with litter, algae and very turbid water present. The pond appeared to be ephemeral and it was considered unlikely to persist for the entire breeding season for newts.

Plate 8: Pond 12

3.3.15 Pond 13

HSI score – 0.76: Rating – Good

Pond 13 formed the smallest of a complex of ponds within a fenced area between the A55 and the road to the north. These ponds appear to have been dug as balancing ponds and there were signs of previous ecological mitigation works having taken place in the vicinity (see Section 1.5.3 for further information). The pond was circular and had good amounts of aquatic vegetation suitable for egg laying by GCN (see plate 9). Great crested newt eggs were present on vegetation during the initial scoping visit (see plate 10). The surrounding vegetation in this area appeared to be highly favourable for foraging amphibians in their terrestrial phase comprising of bramble scrub and cock's foot (*Dactylis glomerata*)-dominated rank grassland. There were also piles of rubble present near the pond indicative of hibernacula built as mitigation for GCN.

Plate 9: Pond 13

Plate 10: Great crested newt egg found in Pond 13

3.3.16 Pond 14

HSI score – 0.83: Rating – Excellent

Pond 14 was also located in the balancing ponds complex (see plate 11). The pond was similar in shape to Pond 13 but much deeper. The pond had abundant vegetation suitable for egg laying by GCN but had a dense border of reedmace around its perimeter. The water quality was good with a high diversity of invertebrates present. Waterfowl in the form of coot (*Fulica atra*), mallard (*Anas platyrynchos*) and moorhen (*Gallinula chlorpus*) were present and may have a negative impact on aquatic vegetation which could be used by newts for egg laying.

Plate 11: Pond 14

3.3.17 Pond 15, 16a, 16b, 16c and 16d

HSI Scores 0.66 – 0.85: Rating Average – Excellent
Ponds 15, 16a, 16b, 16c and 16d formed the remaining five ponds within the balancing pond complex. The ponds were all similar in character to Pond 14 varying only in size.

3.3.18 Pond 17

HSI score – 0.53: Rating – Below average
Pond 17 was located to the south of the A55. The pond was large and comprised a marshy area with very limited open water. The initial survey team could not fully access the pond due to high fences to the south, and the proximity of the A55 to the west. As a consequence the pond was not surveyed further.

3.3.19 Pond 18

HSI score – 0.56: Rating – Below average
Pond 18 was separated from the Northern Section by the A55. It is therefore extremely unlikely that any newts breeding in this pond will be present in the potential development area in their terrestrial phase. The pond is also further than 500m from the smaller development area south of the A55. It is therefore considered unlikely that any newts breeding in this pond would be present within the potential development site in their terrestrial phase. The pond was therefore scoped out and was not surveyed further.

3.3.20 Pond 19, Pond 20 and Pond 21

Ponds 19, 20 and 21 were located to the extreme west of the buffer zone around the potential development boundary. The roundabouts, minor roads and the A55 separated these ponds from all of the potential development area. It is therefore considered unlikely that any newts breeding in these ponds would be able to access

the potential development areas during their terrestrial phase. As a result no further surveys are required.

3.4 Presence or Likely Absence Survey Results

The full results from the presence or likely absence surveys are provided in appendix B and details of the weather conditions during these surveys are provided in appendix C.

The surveys recorded breeding GCN in Pond 13, where eggs were found along with a maximum count of two adult GCN while torching during the first visit. The GCN seen comprised one female and one male.

A single female GCN was also seen while torching Pond 16b during the first visit, but breeding was not confirmed by the presence of eggs or larvae.

No GCN were found in any other pond during the surveys.

Other species of amphibian recorded included palmate newt (*Lissotriton helveticus*), common frog (*Rana temporaria*) and common toad (*Bufo bufo*).

4 Conclusion and Recommendations

The background data search indicated that there was 25 waterbodies within the study area. An HSI was completed for 18 of these waterbodies and follow up the presence likely absence survey on all of those except the waterbodies that were considered unsuitable. The surveys recorded GCN present in the Central Section of the potential development site. No other waterbodies recorded GCN and although there were limitations on the survey timing the visits were considered to have straddled the peak breeding season.

The population recorded in the Central Section was isolated from the Northern Section and Southern Section by roads. The potential for GCN being present in either the Northern or Southern Sections was therefore considered to be negligible based on the results from this survey and a review of the limitations on the survey data.

It is considered highly likely that any development of the Central Section would impact on GCN and would require appropriate mitigation design and implementation. This would require consultation with NRW and an EPS licence to be in place to legalise works.

Further surveys for GCN are not considered necessary at this time but it should be noted that in accordance with NRW guidelines, survey data to inform any EPS licence should be gathered the same year in which the EPS application is made.

5 References

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Appendix A HSI Scores

Pond No.	Geographic Location	Pond Area	Permanence	Water Quality	Shade	Waterfowl	Fish	Pond Count	Terrestrial Habitat	Macrophytes	HSI Score	HSI Rating
1	0.5	0.05	1	0.67	1	1	1	0.9	1	0.75	0.64	Average
2	0.5	0.05	1	0.67	1	1	1	0.9	1	0.8	0.64	Average
3	0.5	0.05	1	0.67	1	1	1	0.9	1	0.8	0.6	Average
4	Not accessed.											
5	0.5	0.8	0.5	0.67	0.4	1	0.33	0.9	1	0.5	0.62	Average
6	0.5	0.7	0.5	0.67	0.8	0.67	1	1	0.67	0.85	0.72	Good
7	0.5	0.1	0.1	0.33	0.3	1	1	1	0.67	1	0.45	Poor
8a	Does not exist.											
8b	0.5	0.1	0.1	0.33	1	1	1	1	1	0.95	0.52	Below average
9	0.5	0.4	0.1	0.33	1	1	1	1	0.67	0.9	0.58	Below
10	Not accessed.											
11a	0.5	0.2	1	0.67	1	0.67	1	1	0.67	0.85	0.69	Average
11b	0.5	0.4	0.5	0.67	0.3	0.67	1	1	1	0.8	0.64	Average
12	0.5	0.2	0.1	0.01	1	1	1	1	1	0.9	0.39	Poor
13	0.5	0.2	1	1	1	0.67	1	1	1	1	0.76	Good
14	0.5	0.8	1	1	1	0.67	1	1	1	0.6	0.83	Excellent
15	0.5	0.2	1	1	1	0.67	1	1	1	0.75	0.74	Good
16a	0.5	0.2	1	1	1	0.67	1	1	1	0.8	0.75	Good
16b	0.5	0.2	1	1	1	0.67	1	1	1	1	0.76	Good
16c	0.5	0.2	1	1	1	0.67	0.33	1	1	0.7	0.66	Average
16d	0.5	1	1	1	1	0.67	1	1	1	0.6	0.85	Excellent
17	0.5	0.4	0.1	0.33	1	1	1	1	0.33	0.81	0.53	Below
18	0.5	0.1	0.5	0.67	1	0.67	1	1	0.33	0.8	0.56	Below
19	Not accessed.											
20	Not accessed.											
21	Not accessed.											

Appendix B Presence Absence Survey Data

Key to presence/absence survey data:

Licence numbers of lead surveyors:

- JJ – Jonathan Jackson 42358:OTHSA:2012
- MJ – Mark Jackson 54163:OTHSA:2014
- BS – Barney Scott 53621:OTHSA:2014.MJ

Other species recorded:

- Bb – Common toad (*Bufo bufo*)
- Lh – Palmate newt (*Lissotriton helveticus*)
- Lv – Common newt (*Lissotriton vulgaris*)
- Rt – Common frog (*Rana temporaria*)
- Stickleback – Three-spined stickleback (*Gasterosteus aculeatus*) or nine-spined stickleback (*Pungitius pungitius*)
- Tc – Great crested newt (*Triturus cristatus*)

Age classes and sex of other species recorded:

- A – Adult
- F – Adult female
- M – Adult male
- L – larvae (newt efts and tadpoles)

Table 4: Pond 1

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
02/04/2014	MJ ME	1	0	Not used	1LhF	6	N	Stickleback	0	-
10/04/2014	JJ EJ	2	0	Not used	1LhF	3	N	Stickleback	0	-

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
06/05/2014	BS MJ	3	0	Not used	1LhF	5	N	Stickleback	0	-
02/06/2014	BS JJ	4	0	0	0	3	N	Stickleback	0	-

Table 5: Pond 2

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
02/04/2014	MJ ME	1	0	Not used	0	8	Y (small newts)	Eel Stickleback	0	-
10/04/2014	JJ EJ	2	1LhF 1LhM	Not used	1LhF	5	Y (small newts)	None	0	-
06/05/2014	BS MJ	3	1LhF	Not used	0	10	Y (small newts)	None	0	-
02/06/2014	BS JJ	4	0	0	0	5	N	None	0	-

Table 6: Pond 3

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
02/04/2014	MJ ME	1	0	Not used	0	6	N	None	0	-
09/04/2014	JJ EJ	2	0	Not used	0	5	N	None	0	-
06/05/2014	BS MJ	3	-	-	-	-	-	-	-	Pond not surveyed – dry

Table 7: Pond 5

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
08/04/2014	JJ EJ	1	RtL	Not used	RtL	5	N	Stickleback	0	-

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
06/05/2014	BS MJ	2	-	-	-	-	-	Stickleback RtL (in mud)	0	Pond not surveyed – dry

Table 8: Pond 6

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
08/04/2014	JJ EJ	1	2LhM	Not used	1LhF 3LhM	18	Y (small newt)	None	0	-
06/05/2014	BS MJ	2	0	Not used	1LhL	20	Y (small newt)	RtL	0	-
02/06/2014	BS JJ	4	0	0	0	10	N	1BbA	0	-
04/06/2014	BS JJ	5	0	Not used	0	10	N	RtL	0	-

Table 9: Pond 11a

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
08/04/2014	JJ EJ	1	4LvF, 6LhM	Not used	0	12	N	None	0	-
07/05/2014	BS MJ	2	0	Not used	0	5	N	None	0	-
02/06/2014	BS JJ	3	0	3LhL	0	5	N	None	0	-
04/06/2014	BS JJ	4	0	Not used	1LhL	5	N	None	0	-

Table 10: Pond 11b

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
08/05/2014	BS MJ	1	0	Not used	Not used	N/A	Not used	N/A	0	Pond could not be safely accessed – See limitations section

Table 11: Pond 12

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
02/04/2014	MJ ME	1	1LhF	N/A	0	2	N	None	0	
09/04/2014	JJ EJ	2	0	N/A	0	2	N	None	0	
07/05/2014	BS MJ	3	-	-	-	-	-	None	-	Pond not surveyed - dry

Table 12: Pond 13

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
07/04/2014	JJ EJ	1	1TcM 1TcF 8LhF	Not used	1TcF	7	Y (Tc)	None	2	-
07/05/2014	BS MJ	2	1TcM 1TcF 1LhM	Not used	0	6	Not used	None	2	-
02/06/2014	BS JJ	3	1TcF 1LhM 1LhF	Not used	0	5	Not used	None	1	-
04/06/2014	BS JJ	4	1TcF	Not used	0	5	Not used	None	1	-

Table 13: Pond 14

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
07/04/2014	JJ EJ	1	0	Not used	0	20	N	Stickleback	0	-
07/05/2014	BS MJ	2	0	Not used	0	29	N	Stickleback	0	-
03/06/2014	BS JJ	3	0	Not used	0	10	N	Stickleback	0	-
05/06/2014	BS JJ	4	1LhM	Not used	0	10	N	Stickleback	0	-

Table 14: Pond 15

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
07/04/2014	JJ EJ	1	1LvF, 2LhF	Not used	0	15	Y (small newt)	Stickleback	0	-
07/05/2014	BS MJ	2	0	Not used	0	20	Y (small newt)	Stickleback	0	-
03/06/2014	BS JJ	3	1 LhF	Not used	0	15	N	Stickleback	0	-
05/06/2014	BS JJ	4	0	0	Not used	N/A	N	Stickleback Water vole	0	Night water temp >18°C

Table 15: Pond 16a

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
07/04/2014	JJ EJ	1	0	Not used	1LhM	15	N	Stickleback	0	-
07/05/2014	BS MJ	2	0	Not used	0	18	N	Stickleback	0	-

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
03/06/2014	BS JJ	3	0	Not used	0	10	N	Stickleback	0	-
05/06/2014	BS JJ	4	0	0	Not used	N/A	N	RtL Stickleback	0	Night water temp >18°C

Table 16: pond 16b

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
09/04/2014	JJ EJ	1	1TcF, 1LhM	Not used	0	12	N	None	1	-
08/05/2014	BS MJ	2	1LhF	Not used	0	15	Y (small newt)	None	0	-
03/06/2014	BS JJ	3	1LhF	Not used	0	10	N	None	0	-
05/06/2014	BS JJ	4	0	0	Not used	N/A	N	None	0	Night water temp >18°C

Table 17: Pond 16c

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
09/04/2014	JJ EJ	1	2LhF	Not used	BbL	10	N	Stickleback	0	-
08/05/2014	BS MJ	2	0	Not used	0	14	N	Stickleback	0	-
03/06/2014	BS JJ	3	0	Not used	0	5	N	Stickleback Water vole	0	-
05/06/2014	BS JJ	4	0	0	Not used	N/A	N	Stickleback	0	Night water temp >18°C

Table 18: Pond 16d

Date	Surveyor initials	Survey Number	Torch	Net	Bottle Trap	No of traps used	Egg search (found Y/N)	Other species	Max GCN count single method	Notes
09/04/2014	JJ EJ	1	1LhF, 2LhF	Not used	BbL	20	N	Stickleback	0	-
08/05/2014	BS MJ	2	0	Not used	0	59	N	Eel Stickleback	0	-
03/06/2014	BS JJ	3	0	Not used	0	21	N	Stickleback	0	-
05/06/2014	BS JJ	4	0	1Lh M	Not used	N/A	N	Eel Stickleback	0	-

Appendix C Presence Absence Survey Weather Data

Rain – This is measured on an arbitrary scale of 0-5 which denotes the extent to which rainfall impacts on the torching survey methodology as ripples from raindrops make it difficult to see newts. A level above three is considered to be a significant constraint.

Turbidity – This is measured on an arbitrary scale of 0-5 which denotes the extent to which cloudy water impacts on the torching survey methodology. A level above three is considered to be a significant constraint.

Wind – This is measured on the Beaufort Scale as wind can also cause ripples and impact on the effectiveness of torching surveys. However, this is influenced by the size of ponds and during these surveys did not influence the results.

Vegetation cover – This is measured as a percentage of the surface of the water that is visible for torching.

Temperatures – The temperatures are taken to make sure that night-time temperatures are within safe limits for bottle trapping.

Table 19: Pond 1

Visit	Date	Surveyor	Rain 0-5	Turbidity 0-5	Wind 0-10	Veg cover %	Temperature – night air °C	Temperature – night water °C	Temperature - morning air °C	Temperature - morning water °C
1	02/04/2014	MJ ME	0	0	0	80	15	Not recorded	13	Not recorded
2	10/04/2014	JJ EJ	0	2	0	80	11.5	12	9.3	10
3	06/05/2014	BS MJ	0	2	1	80	12	12.4	11.4	12
4	02/06/2014	BS JJ	0	2	1	80	14	16.4	13.5	16.8

Table 20: Pond 2

Visit	Date	Surveyor	Rain 0-5	Turbidity 0-5	Wind 0-10	Veg cover %	Temperature – night air °C	Temperature – night water °C	Temperature - morning air °C	Temperature - morning water °C
1	02/04/2014	MJ ME	0	0	0	10	15	Not recorded	13	Not recorded
2	10/04/2014	JJ EJ	2	2	0	10	11.5	12.3	9.3	9
3	06/05/2014	BS MJ	0	3	8	40	12	12.4	11.4	12
4	02/06/2014	BS JJ	0	4	0	60	14	16	13.8	15.2

Table 21: Pond 3

Visit	Date	Surveyor	Rain 0-5	Turbidity 0-5	Wind 0-10	Veg cover %	Temperature – night air °C	Temperature – night water °C	Temperature - morning air °C	Temperature - morning water °C
1	02/04/2014	MJ ME	0	0	0	Not recorded	15	Not recorded	13	Not recorded
2	09/04/2014	JJ EJ	0	0	0	95	10.8	12	10.3	10.8

Table 22: Pond 5

Visit	Date	Surveyor	Rain 0-5	Turbidity 0-5	Wind 0-10	Veg cover %	Temperature – night air °C	Temperature – night water °C	Temperature - morning air °C	Temperature - morning water °C
1	07/04/2014	BS ME	1	1	4	50	9.7	11	7.6	6.1
2	08/04/2014	JJ EJ	0	1	0	20	10.1	11.4	10.1	10

Table 23: Pond 6

Visit	Date	Surveyor	Rain 0-5	Turbidity 0-5	Wind 0-10	Veg cover %	Temperature – night air °C	Temperature – night water °C	Temperature - morning air °C	Temperature - morning water °C
1	07/04/2014	BS ME	3	2	5	50	8.4	9.9	7.4	6.9
2	08/04/2014	JJ EJ	0	1	0	90	10.1	10.6	10.1	10.3
3	06/05/2014	BS MJ	0	1	8	95	13	12.4	11	11.2
4	04/06/2014	BS JJ	0	1	1	95	14	15.4	13.6	15

Table 24: Pond 11a & 11b

Visit	Date	Surveyor	Rain 0-5	Turbidity 0-5	Wind 0-10	Veg cover %	Temperature – night air °C	Temperature – night water °C	Temperature - morning air °C	Temperature - morning water °C
1	08/04/2014	JJ EJ	0	1	1	85	10.1	12	10.1	10.1
2	07/05/2014	BS MJ	0	2	7	85	12	13.4	11.4	11.8
3	02/06/2014	BS JJ	0	2	2	85	14.5	16	13.3	15.6
4	04/06/2014	BS JJ	0	2	0	85	12.6	14.7	15.4	14.6

Table 25: Pond 12

Visit	Date	Surveyor	Rain 0-5	Turbidity 0-5	Wind 0-10	Veg cover %	Temperature – night air °C	Temperature – night water °C	Temperature - morning air °C	Temperature - morning water °C
1	02/04/2014	MJ ME	0	0	0	60	15	Not recorded	13	Not recorded
2	09/04/2014	JJ EJ	0	0	0	95	10.8	11.2	10.3	11.2

Table 26: Pond 13

Visit	Date	Surveyor	Rain 0-5	Turbidity 0-5	Wind 0-10	Veg cover %	Temperature – night air °C	Temperature – night water °C	Temperature - morning air °C	Temperature - morning water °C
1	07/04/2014	JJ EJ	0	0	0	80	8.8	12.5	7.1	9.6
2	07/05/2014	BS MJ	0	0	5	80	12	13.7	12.6	13
3	02/06/2014	BS JJ	0	0	0	80	14.1	16.4	14.5	16.1
4	04/06/2014	BS JJ	0	0	0	80	14	16	15	16.6

Table 27: Pond 14

Visit	Date	Surveyor	Rain 0-5	Turbidity 0-5	Wind 0-10	Veg cover %	Temperature – night air °C	Temperature – night water °C	Temperature - morning air °C	Temperature - morning water °C
1	07/04/2014	JJ EJ	0	0	0	60	8.8	12.5	7.1	9.6
2	07/05/2014	BS MJ	0	1	5	60	12	13.7	12	13
3	03/06/2014	BS JJ	0	0	0	60	14	16	15	16.6
4	05/06/2014	BS JJ	0	0	0	60	11.1	21	N/A*	N/A*

*Pond was not visited in the morning as trapping was not used due to night-time water temperatures >18°C

Table 28: Pond 15

Visit	Date	Surveyor	Rain 0-5	Turbidity 0-5	Wind 0-10	Veg cover %	Temperature – night air °C	Temperature – night water °C	Temperature - morning air °C	Temperature - morning water °C
1	07/04/2014	JJ EJ	0	0	0	30	8.8	13	7.1	10.6
2	07/05/2014	BS MJ	0	1	5	30	12	13.7	12.6	13
3	02/06/2014	BS JJ	0	0	0	30	16.1	18	14.5	17
4	05/06/2014	BS JJ	0	0	0	30	11.1	21	N/A*	N/A*

*Pond was not visited in the morning as trapping was not used due to night-time water temperatures >18°C

Table 29: Pond 16a

Visit	Date	Surveyor	Rain 0-5	Turbidity 0-5	Wind 0-10	Veg cover %	Temperature – night air °C	Temperature – night water °C	Temperature - morning air °C	Temperature - morning water °C
1	07/04/2014	JJ EJ	0	0	0	70	8.8	12.7	7.1	9.6
2	07/05/2014	BS MJ	0	0	5	70	12	13.7	12.6	13
3	03/06/2014	BS JJ	0	0	0	70	14	16.7	16	16.6
4	05/06/2014	BS JJ	0	0	0	70	11	21	N/A*	N/A*

*Pond was not visited in the morning as trapping was not used due to night-time water temperatures >18°C

Table 30: Pond 16b

Visit	Date	Surveyor	Rain 0-5	Turbidity 0-5	Wind 0-10	Veg cover %	Temperature – night air °C	Temperature – night water °C	Temperature - morning air °C	Temperature - morning water °C
1	09/04/2014	JJ EJ	0	0	0	65	10.8	14	10.3	11.6
2	08/05/2014	BS MJ	0	0	2	65	12.6	14	11.2	12
3	03/06/2014	BS JJ	0	0	0	65	14.1	16.4	15	16.6
4	05/06/2014	BS JJ	0	0	0	65	11	21	N/A*	N/A*

*Pond was not visited in the morning as trapping was not used due to night-time water temperatures >18°C

Table 31: Pond 16c

Visit	Date	Surveyor	Rain 0-5	Turbidity 0-5	Wind 0-10	Veg cover %	Temperature – night air °C	Temperature – night water °C	Temperature - morning air °C	Temperature - morning water °C
1	09/04/2014	JJ EJ	0	1	2	30	10.8	13.7	10.3	12.1
2	08/05/2014	BS MJ	0	1	2	30	12.6	14	11.2	12.6
3	03/06/2014	BS JJ	0	1	0	30	14	16.5	15.1	16.4
4	05/06/2014	BS JJ	0	1	0	30	11	21.1	N/A*	N/A*

*Pond was not visited in the morning as trapping was not used due to night-time water temperatures >18°C

Table 32: Pond 16d

Visit	Date	Surveyor	Rain 0-5	Turbidity 0-5	Wind 0-10	Veg cover %	Temperature – night air °C	Temperature – night water °C	Temperature - morning air °C	Temperature - morning water °C
1	09/04/2014	JJ EJ	0	1	0	40	10.8	13.1	10.3	11.8
2	08/05/2014	BS MJ	0	1	2	40	12.6	14	11.2	12.6
3	03/06/2014	BS JJ	0	1	0	40	14	16.4	15.1	16.3
4	05/06/2014	BS JJ	0	1	0	40	11	21	N/A*	N/A*

*Pond was not visited in the morning as trapping was not used due to night-time water temperatures >18°C