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CLIENT: Yorkshire Water Services Ltd.

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Specify any Holds within the document.

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Specify significant change from previous revisions of the document. (From initial onwards)

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Lundwood WwTW Upgrade AMP 6

SITE WIDE

Planning Statement

R1263-GHD-316-01-RP-Z-01023

P01

October 2017

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1. Development Description & Planning Context

Lundwood WwTW is an existing Yorkshire Water (YW) Waste Water Treatment Works constructed circa 1960 in the village of Lundwood, 3.2km east of Barnsley, South Yorkshire. The approximate grid reference for the site is SE378070, the nearest postcode is for Lund Lane, S71 5NP.

The site is bounded by the River Dearne and fields to the e and by a housing estate to the North East.



2. Why is this Development Required?

On the 31st of March 2020 the ammonia consent at Lundwood Waste Water Treatment Works (WwTW) will be reduced from 5mg/l to 1mg/l on a 95%ile basis. The Biological Oxygen Demand (BOD) consent will also be reduced from 20mg/l to 12mg/l. The combined effluent from the existing percolating filters and activated sludge plant (ASP) on the site will not achieve this level of treatment in a robust and dependable manner. An upgrade to the treatment process on the site is therefore required. The scheme will improve the downstream quality of water in the River Dearne for a stretch of 72km.

3. What Does the Development Consist of?

The following is a brief summary of the scope of works to be constructed by Interserve (ICL) on behalf of YW at Lundwood WwTW:

1. A new inlet works is required. The inlet works shall be designed to treat maximum flow that can be passed to the treatment plant, with fine screens and grit removal system.
2. New primary tank desludge system is required to replace the existing diaphragm pumps.
3. A new Activated Sludge Plant (ASP) constructed to the north of the existing ASP.

4. Additional final settlement tank capacity, 3no. new 25m diameter final settlement tanks.
5. Two new sludge storage tanks, for blending primary and secondary sludge prior to thickening.
6. New sludge thickening system for primary and secondary sludge including new feed tanks and polymer dosing equipment.

Decommissioning and demolition, where detailed, of redundant plant.

4. Permitted Development & Planning Permission

YW benefit from permitted development rights. The majority of the works are classified as permitted development, those structures which are outside the permitted development are seeking planning permission are identified below:

- NPG Substation Kiosk
- 11kV MV Switchroom Kiosk
- LV Transformer Kiosk
- Inlet Works MCC Kiosk
- PST MCC Kiosk
- ASP Transformer Kiosk
- ASP/ FST MCC Kiosk
- Sludge Thickening Building

Key structures benefitting from permitted development:

Ref	Structure	Approximate Plan Dimensions	Approximate Max Height Above Ground Level
1.	Inlet Works	19m x 11m	1.5m
2.	Detritors	18m x 22m	1.5m
3.	Screens Handling Area	15m x 20m	0m
4.	Inlet Works Odour Control	3m x 4m 1.5m diameter stack	0m Max 15m
5.	2No. Sludge Blend Storage Tanks	15m diameter	7m
6.	Sludge Area Odour Control	16.5m x 6m 2m diameter stack	0m Max 15m
7.	Activated Sludge Plant	42m x 44m	2.5m
8.	3No. Final Settlement Tanks	25m diameter	2m

In addition to those structures identified above there will be distribution chambers, pumping stations, manholes, pipework and slabs for new equipment.

4.1 Site Layout

For reasons of practicality and operation, the scope for the location of the new structures is limited by tie in locations into the existing works. The overall site layout drawing is included in Appendix A.

4.2 Landscaping

Due to the slope of the site, re-profiling is required in the location of the proposed ASP. Further re-profiling around some of the buried plant items is also required.

The redundant plant, equipment and structures on the existing site will be demolished and the ground re-profiled and returned to grass.

5. How is Odour Controlled?

The existing high rate filter odour control unit which serves the existing inlet works will be decommissioned. Due to the close proximity to houses the new inlet works will have a new odour control system installed. The entire inlet works will be covered, this includes the reception chamber, screen fed channels and screens up to the grit bay.

The new sludge drum thickening building and sludge blend storage tanks will have a new odour control system. The new sludge drum thickening building will thicken blended primary and secondary sludge. The 4No. thickening units shall be covered and enclosed and the building will have active ventilation. The new sludge blend tanks shall be covered. Primary and secondary sludge shall be blended in the tanks prior to thickening.

6. Noise Assessment

A noise assessment for the project has not been undertaken nor is it considered necessary unless stipulated a planning requirement. All construction works and vehicle movements will limited to:

Mon - Friday 7am - 6pm

Sat - 7am - 4pm

Sunday – None working day

Following construction handover the works will be operated as per the existing works. It is considered that all new plant/ equipment creating noise will have replaced similar assets. It is envisaged the main contributor to noise generated from site will be from the new sludge drum thickening building; this is being constructed in close proximity to and as a direct replacement of the existing thickening building, therefore this no notable change in noise level anticipated.

7. Flood Risk

A flood risk assessment has been undertaken and provided as part of this planning submission, see document R1263-GHD-316-01-RP-Z-01022.

8. Ecology

Prior to the engagement of ICL as design and build contractor, Arup undertook a preliminary Ecological Appraisal of the existing site, see Appendix B.

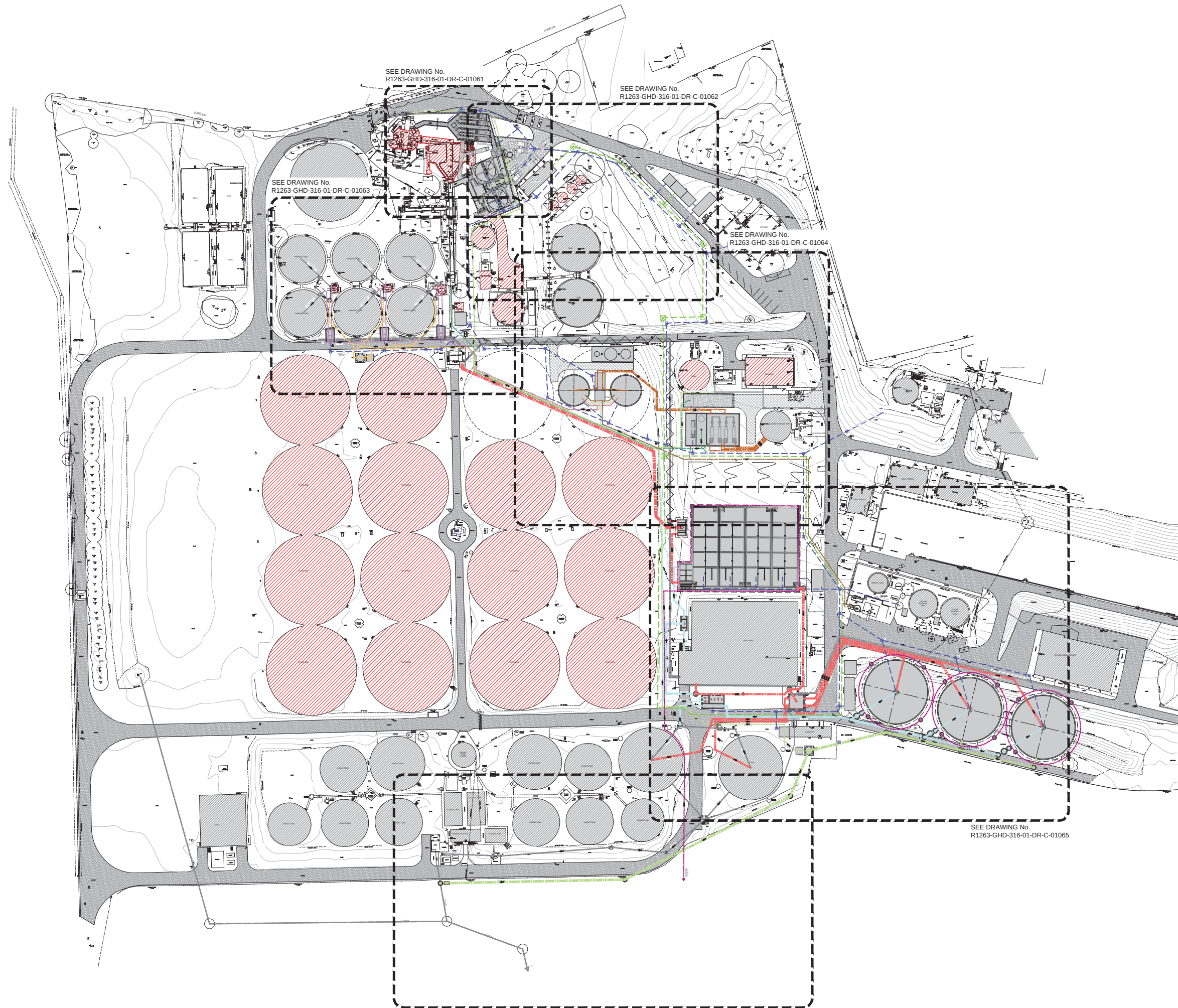
9. Access

Access to the site will be gained via the existing main site entrance off Lund Lane, off the A628 Pontefract Road and will be limited to YWS personnel, ICL and their appointed suppliers and sub-contractors.

Following construction handover the works will be operated as per the existing works, with vehicle movements by YW operatives and tankers equal to that of the existing.

Appendix A

Site Layout



SEE DRAWING No.
R1263-GHD-316-01-DR-C-01063

SEE DRAWING No.
R1263-GHD-316-01-DR-C-01061

SEE DRAWING No.
R1263-GHD-316-01-DR-C-01062

SEE DRAWING No.
R1263-GHD-316-01-DR-C-01064

SEE DRAWING No.
R1263-GHD-316-01-DR-C-01065

SEE DRAWING No.
R1263-GHD-316-01-DR-C-01066

SITE PLAN
SCALE 1:750

NOTES

- DO NOT SCALE FROM THIS DRAWING.
- ALL DIMENSIONS ARE IN MILLIMETRES (mm) & ALL LEVELS ARE IN METRES (m) AOD, UNLESS STATED OTHERWISE.
- ALL DIMENSIONS & LEVELS CHECKED ON SITE AND ANY DISCREPANCIES REPORTED TO GHD.

LEGEND

	EXISTING ROAD		EXISTING STRUCTURE
	NEW STRUCTURE		EXISTING STRUCTURES TO BE DECOMMISSIONED
	NEW CONCRETE ACCESS ROAD		NEW ASPHALT ACCESS ROAD
	WASTEWATER MAIN		PRIMARY SLUDGE OUTLET MAIN
	PST FLOW THROUGH TO FST'S		SCUM OUTLET MAIN
	RAS/SAS PIPEWORK		EXISTING PIPEWORK
	RETURN LIQUORS MAIN		INLET WORKS DRAIN
	DIVERTED IMPORTED SLUDGE STRUCTURE TOE DRAIN		SLUDGE THICKENING PIPEWORK
	LV CABLE ROUTE		HV CABLE ROUTE

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Appendix B

Ecological Appraisal (Report No. 0-15-08)

Yorkshire Water Services Ltd
Lundwood WwTW
Preliminary Ecological Appraisal

0-15-08

Issue 1 | 06 June 2016

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 247877-00

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Document Verification

ARUP

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Drawings

Drawing 1: Phase 1 Habitat survey map.

Appendices

Appendix A

HSI Calculation Results

Executive Summary

This report details the results of the Preliminary Ecological Appraisal (PEA) undertaken at Lundwood WwTW. The key results are as follows:

No statutory or non-statutory nature conservation designated sites were identified within the site boundary or adjacent to the site. Therefore no impacts are anticipated on designated sites.

The northern half of the site is dominated by hardstanding, between which are areas of amenity and improved grassland. Scrub and tall ruderal vegetation is present along the site boundary. The southern half of the site is dominated by tall ruderal vegetation, with areas of standing water, scrub and hardstanding. The River Dearne runs adjacent to the southern boundary. A watercourse runs through the middle of the site and joins the River Dearne towards the sites eastern boundary.

Himalayan balsam *Impatiens glandulifera* was identified within the operational site. A method statement and management plan will be required in order to avoid the spread of invasive species off site.

No signs of otter were observed, however suitable vegetation which may provide sheltering opportunities was present. A pre-construction otter survey is recommended if works are to occur within 30m of the watercourse.

Suitable foraging habitat for bats was identified on site and one building was identified to have low bat roost suitability. If this building is to be impacted, directly or indirectly (noise, vibration or light) by the proposed works it is recommended that a bat activity survey is undertaken following current survey guidelines.

Suitable habitat for water vole was identified within the watercourse running east to west in the centre of the site. If works are to occur within 15m of this watercourse, it is recommended that temporary fencing is erected to form an exclusion zone. It is also recommended that a method statement is developed detailing how works will be undertaken to prevent the disturbance to water vole.

Suitable habitat for nesting birds was identified on site. If vegetation clearance is to occur within the nesting bird season, a nesting bird survey is to be carried out by a qualified ornithologist immediately prior to the vegetation clearance taking place.

Three waterbodies were identified on site, one of which was found to have excellent suitability for great crested newts. The results of an eDNA survey on this waterbody proved positive for the presence of great crested newts on site. It is therefore necessary to obtain a licence from Natural England prior to works taking place and there will be seasonal restrictions to when these works can occur.

Suitable vegetation for reptiles was identified on site. A method statement should be developed that indicates that vegetation clearance should be phased and what contractors should do if reptiles are observed on site.

1 Introduction

Ove Arup and Partners Ltd. (Arup) were commissioned by Yorkshire Water Services Limited to undertake a Preliminary Ecological Appraisal (PEA) (Phase 1 Habitat survey and protected species scoping study) of Lundwood Waste water Treatment Works (WwTW) (SE378070).

1.1 Site and Scheme Description

Lundwood WwTW is located in the village of Lundwood approximately 3.2km east of Barnsley, South Yorkshire. The Lundwood site is approximately 32.8ha in size and is denoted by the approximate red line boundary on Drawing 1.

It is proposed that the existing filtering system is updated which will require the construction of a new building.

1.2 Report Objective

The report objectives are to identify the habitats within the survey area (approximate red line boundary; Drawing 1), assess the potential for, or presence of, any protected or notable species, potential ecological impacts, further survey requirements and to outline mitigation and potential enhancement options, as appropriate.

1.3 Report Structure

The report includes:

- Section 2: Legal and Policy Context.
- Section 3: Methodology.
- Section 4: Results.
- Section 5: Discussion and Recommendations.
- Section 6: Conclusion.

2 Legal and Policy Context

There is a comprehensive system of legislation, both domestic and international, which aims to protect biodiversity at the landscape, habitat and species level. Much of the legislation pertaining to biodiversity exists within, and also independently of, the planning process.

2.1 Wildlife and Countryside Act 1981 (WCA) (as amended)

This is the primary legislation covering endangered species in England and sets out the framework for the designation of Sites of Special Scientific Interest (SSSIs). It confers differing levels of protection on species themselves, their habitats, or both, depending on their conservation status. Species offered protection by the Act are listed in a series of schedules. These Schedules are subject to a rolling review on a five yearly basis. Protected species are listed under Section 1 (birds), Schedule 5 (animals other than birds and invertebrates) and Schedule 8 (plants).

2.2 Countryside and Rights of Way Act 2000

This Act affords a greater level of protection to Sites of Special Scientific Interest (SSSIs), provides enhanced management arrangements for Areas of Outstanding Natural Beauty (AONBs), and strengthens wildlife enforcement legislation. This Act has amended the Wildlife and Countryside Act by the addition of the term 'recklessly' to Section 1(5) and Section 9 (4) which has resulted in additional obligations with respect to protected species. As such, it is now an offence to intentionally or recklessly disturb protected species listed on the relevant Schedules of the WCA.

2.3 Natural Environment and Rural Communities Act 2006

The Natural Environment and Rural Communities (NERC) Act 2006, is designed to help achieve a rich and diverse natural environment and thriving rural communities. Under Section 40 there is a Duty to conserve biodiversity; specifically Subsection (1) states *"Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity."*

Section 41 (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40.

2.4 The Protection of Badgers Act 1992

This Act brings together all the legislation that is specific to badgers *Meles meles*, with the exception of their inclusion on Schedule 6 of the Wildlife and Countryside Act 1981, (which prohibits certain methods of taking or capture). The Act makes it an offence to intentionally kill or ill-treat a badger, and destroy, disturb or obstruct a sett. Specifically, it imposes restrictions on works carried out within certain distances of badger setts. Any works that will directly impact on an existing sett are only permitted subject to approval through the issue of a licence from Natural England.

2.5 EC Directive Conservation of Natural Habitats & Flora (92/43/EEC)

The Conservation of Habitats and Species Regulations 2010 (as amended) are the British response to the Habitats & Species Directive 1992 issued by the European Community (EC) (which is now the European Union (EU)). They offer protection to a number of plant and animal species throughout the EC via the designation of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). In the United Kingdom these regulations are implemented through the Wildlife and Countryside Act 1981 (as amended).

The Regulations for the protection of European Protected Species (EPS) have been amended and consolidated with key changes including the removal of most of the defences from regulation 40 and regulation 43 including the removal of the ‘incidental result of an otherwise lawful operation’ defence, and the increase in the threshold for the offence of deliberately disturbing an EPS. Proposals that will affect European Protected Species may require a licence from Natural England to allow an otherwise unlawful act. In 2009 a new offence of ‘breaching condition of an EPS licence’ was added to the regulations. The licensing process is separate from the planning process. European protected species include all species of bats, great crested newt *Triturus cristatus*, and European otter *Lutra lutra*.

2.6 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published in March 2012 and is a material consideration in all planning decisions. NPPF refers to the responsibilities of the local authorities to conserve the natural environment with respect to the use of the ‘Circular 6/2005: Biodiversity and Geological Conservation – Statutory Obligation and their Impact within the Planning System’ as guidance in this process. All public bodies including local planning authorities are to consider habitats and species of Principal Importance listed in Section 41 of the NERC Act and Priority Species / Habitats within Biodiversity Action Plans when considering a planning application.

2.7 Non-Statutory Local Sites

Non-statutory local sites are referred to as Local Wildlife Sites (LWS) within the region. These sites are of county importance for their wildlife value. They have

no statutory protection but are recognised by Local Authorities and statutory agencies and their presence is fully considered when determining planning applications.

3 Methodology

3.1 Desk Study

Protected species records within a 2km radius surrounding the Lundwood site were obtained from Yorkshire Water, who receive an annual download of species records from the local records centre (Sheffield Biological Records Centre). Non-statutory designated site information was obtained directly from Sheffield Biological Records Centre.

The Multi-Agency Geographic Information for the Countryside (MAGIC) website www.magic.gov.uk was consulted for statutory designated site information within 2km of the site.

Ordnance Survey maps were examined for the presence of mapped waterbodies within a 250m radius of the proposed site area.

3.2 Field Survey

3.2.1 Phase 1 Habitat Survey

A field survey of the site was carried out in April 2016. Habitats were identified using the standard Phase 1 Habitat survey methodology (JNCC, 2010¹). As part of the field survey, the potential for the site to support any legally protected or notable faunal species was also assessed. Unless otherwise specified, detailed faunal surveys were not undertaken at this stage; rather the potential for the site to support each species or species group was assessed based on the known range of each species or species group, and the suitability of the habitats within the site. Field signs or sightings of such species were recorded as observed.

3.2.2 Great Crested Newt eDNA Survey

An eDNA survey for great crested newts was carried out in May 2016 on three identified waterbodies within the site boundary. Samples were taken of each waterbody in accordance with recommended guidelines (Biggs *et al.* 2014)². These samples were sent to an approved laboratory who processed the samples and returned results of the survey.

3.3 Survey Limitations

Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. Therefore, the

¹ Joint Nature Conservation Committee (JNCC) (2010) *'Handbook for Phase 1 Habitat Survey. A technique for environmental audit'*. Revised re-print. JNCC: Peterborough.

² Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffiths, R.A., Foster, J., Wilkinson, J., Arnett, A., Williams, P. and Dunn, F. (2014) *Analytical and methodological development for improved surveillance of the Great Crested Newt*. Defra Project WC1067. Freshwater Habitats Trust: Oxford.

absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. However, professional judgement allows for the likely presence of these species to be predicted with sufficient certainty so as to not significantly limit the validity of these findings.

4 Results

4.1 Desk Study

The full results of the desk study are provided below.

4.1.1 Designated Sites

4.1.1.1 Statutory Designations

No statutory designations were identified within the site boundary or adjacent to the site.

One non-statutory designated site was identified within 2km of the site:

- Dearne Valley Park Local Nature Reserve (LNR), which lies approximately 0.9km west of the site. It is an acidic oak woodland with a mosaic of wetland habitats.

The closest Site of Special Scientific Interest (SSSI) within 2km of the site is Stairfoot Brickworks SSSI. However this is noted for its geological importance. The closest SSSI noted for ecological importance is Seckar Wood approximately 8.4km northwest which is noted for its areas of heathland and woodland.

The closest international statutory designated site is Denby Grange Colliery Ponds Special Area of Conservation (SAC)/SSSI approximately 13.1km to the north-west. The site supports the largest known breeding colony of great crested newts *Triturus cristatus* in West Yorkshire.

The website MAGIC (www.magic.gov.uk) includes information detailing the SSSI Impact Risk Zones, which have been developed to guide planners on whether a development would impact on a SSSI/SAC/SPA/Ramsar site. This demonstrates that no impact buffers reach the proposed site and therefore proposed works are unlikely to impact any designated sites due to disturbance or pollution pathways.

4.1.1.2 Non-statutory Designations

Sheffield Biological Records Centre indicated that there are no non-statutory designations within the site boundary or within 2km of the site.

4.1.2 Species Records

4.1.2.1 Otters

During the records search, six records of otter *Lutra lutra*, were identified. Two records were along the River Dearne to the south of the site, with the nearest record approximately 350m south. Three records were to the west, with the

nearest record approximately 960m and one to the north of the site which was approximately 1.6km from site.

4.1.2.2 Water voles

Three records of water vole *Arvicola amphibius*, were identified from the records search. These were approximately 1.6km west of the site. In 2006, a water vole survey (Arup 2006³) found signs of potential water vole activity including two potential burrows and a possible feeding station. These were located within the watercourse running through the middle of the site (approximate location of TN8; Drawing 1).

4.2 Field Survey

The results of the field surveys undertaken within the site at Lundwood WwTW are described below.

4.2.1.1 Habitats

The Phase 1 Habitat map is detailed in Drawing 1. This graphically represents the habitats recorded within the survey area. The following habitat types were identified within the site:

- Hardstanding.
- Buildings.
- Tall ruderal.
- Scrub (dense and scattered).
- Amenity grassland.
- Improved grassland.
- Scattered broadleaved trees.
- Running and standing water.

4.2.1.2 Hardstanding and Buildings

The operational WwTW is located on the northern half of the study area (Drawing 1). The majority of the operational site is dominated by buildings and hardstanding including the operational WwTW site, road network and car parking. The buildings were observed to be of recent construction; comprising either brick buildings with flat roofs or corrugated metal warehouses and sheds.

4.2.1.3 Tall Ruderal

The majority of the site to the south, where the old sludge lagoons are located, comprises tall ruderal vegetation which has colonised bunds that have been left

³ Arup (2006) Water vole survey - Memorandum.

undisturbed. Tall ruderal vegetation is also present along the margins of the operational site and the road network and along the banks of the running watercourse in the middle of the site (TN6; Drawing 1). Species recorded included common nettle *Urtica dioica*, rosebay willowherb *Chamerion angustifolium*, broadleaved dock *Rumex obtusifolius*, cow parsley *Anthriscus sylvestris*, teasel *Dipsacus fullonum*, creeping thistle *Cirsium arvense*, Yorkshire fog *Holcus lanatus*, cocksfoot *Dactylus glomerata* and cleavers *Galium aparine*.

4.2.1.4 Scrub and Trees

Scattered scrub is present on the margins of the operational site and throughout the southern old sludge lagoon area.

Scattered broadleaved trees are present along the river in the south and around the margins of the entire operational site. They are also scattered along the watercourse in the middle of the site (TN8; Drawing 1). An area of native bluebell *Hyacinthoides non-scripta*, is present towards the north western boundary of the site which is adjacent to a small broadleaved woodland (TN9; Drawing 1).

Scrub and tree species recorded included bramble *Rubus fruticosus* agg., willow *Salix* sp., silver birch *Betula pendula*, elder *Sambucus nigra*, common hawthorn *Crataegus monogyna*, oak *Quercus* sp., cherry *Prunus* sp., laurel *Lauraceae* sp., Leyland Cypress *x Cupressocyparis leylandii* and holly *Ilex aquifolium*.

4.2.1.5 Improved and Amenity Grassland

Amenity and improved grassland was observed around the operational WwTW. The transition between the two habitat types occurs due to a variation in management intensity e.g. amenity grassland is frequently cut.

Species recorded included Yorkshire fog, cocksfoot, meadow grass *Poa* sp., ground ivy *Glechoma hederacea*, ribwort plantain *Plantago lanceolata*, creeping buttercup *Ranunculus repens*, common daisy *Bellis perennis*, broadleaved dock and creeping thistle.

4.2.1.6 Running and Standing Water

A slow running watercourse was identified on site dividing the operational site to the north and sludge lagoons to the south (TN3, TN6, TN7; Drawing 1). This connected in the east to the River Dearne. The water became more stagnant towards the west with tall ruderal vegetation encroaching into the watercourse and an increase in macrophyte cover within the watercourse.

Standing water was identified in three areas on the southern half of the site. Waterbody 1 (WB1; Drawing 1), was a shallow waterbody dominated by bulrush *Typha latifolia*. Waterbody 2 (WB2; Drawing 1) was a shallow waterbody whose margins were dominated by canary reed grass *Phalaris arundinacea*, flag iris *Iris pseudacorus* and willow were also present. It is likely that this waterbody is formed when the river is in flood and the surrounding bunds slow the release of this water back into the river. Waterbody 3 (WB3; Drawing 1) was a shallow waterbody dominated by canary reed grass with bulrush.

4.2.1.7 Invasive Plant Species

Himalayan balsam *Impatiens glandulifera*, was present (TN4; Drawing 1) within the operational site, and forming large stands along the eastern banks (TN3; Drawing 1) of the running watercourse. Giant hogweed *Heracleum mantegazzianum* (TN2; Drawing 1) and Japanese knotweed *Fallopia japonica* (TN1; Drawing 1), were present within the southern half of the site (sludge lagoons) and were concentrated along the banks of the River Dearne. The distribution of invasive weeds may be more extensive as the survey was undertaken early in the growing season.

4.2.2 Fauna

During the Phase 1 Habitat survey signs of protected fauna were recorded if observed. In addition, the habitats were assessed as to their potential to support protected species. The protected species groups sought/assessed include:

- Mammals (terrestrial and riparian).
- Birds.
- Herpetofauna (amphibians and reptiles).
- Invertebrates.

4.2.2.1 Otters

A detailed inspection of the watercourse running through the middle of the site could not be undertaken due to the steep banks and lack of access to the northern bank. However, no signs (spraint, resting up areas) of otter were observed. Vegetation on the banks of this watercourse were not found to be dense and there were no mature trees that would provide suitable sites for otters to shelter. During the peak growing season, the vegetation may become thicker and denser which may provide otter with sheltering opportunities. The desktop records provide evidence that otters are present within the area and there is the possibility for them to migrate along the watercourse due to its connectivity to the River Dearne. The food resources for otters within the site are limited within the operational area, however, they could forage within the southern area of the site where there is higher potential for prey items such as amphibians. However, a public path runs adjacent to the River Dearne which was observed to be used by dog walkers. This will reduce the likelihood of otters sheltering due to disturbance, therefore it is considered that the watercourse on site has low potential for otters to shelter.

4.2.2.2 Bats

The habitat mosaic including the filtering tanks are likely to support a high invertebrate biomass. This potentially provides an enhanced foraging resource habitat for bats. The operational site is partially lit with security lighting on the access roads and outside buildings but the southern half of the site is unlit. Light sensitive bat species are more likely to forage within the southern half of the site whilst light tolerant species are likely to forage and commute across the

operational site. The site is connected to the River Dearne which provides connective linkages off site.

One building was identified to have low roosting suitability (TN5, Drawing 1). The building contained a soffit box which appeared to have a gap in the corner which would provide bats with a potential point of access to roost in the soffit. No signs of bats were found at the time of the survey, but the survey was undertaken early in the bat active season and after a period of heavy rain. Therefore, bat droppings may have been washed away.

4.2.2.3 Water voles

The watercourse running through the middle of the site which joins the River Dearne on the west provides suitable habitat for water vole. This is due to the increase in vegetation cover, suitable water levels and steepness of the banks which could provide burrowing opportunities. A detailed inspection of the river bank could not be undertaken due to the steep banks and lack of access to the northern side. However, periodic access could be made and two feeding piles were identified during the survey on the eastern and central section of the watercourse (TN6 and TN7; Drawing 1). All species of vole can create these piles. As no droppings were identified during the survey, these piles cannot be confirmed to be water vole. Therefore a water vole survey will be required which was beyond the scope of this survey.

4.2.2.4 Birds

The scrub, broadleaved trees and unmanaged cleared area within the sludge lagoon provides suitable nesting habitat for a range of common bird species as well as ground nesting birds. The current proposed works location within the operational site is unlikely to impact on suitable habitat in which birds will nest as this consists of improved and amenity grassland and an area of tall ruderal vegetation.

The following birds were noted during the survey: black headed gull *Chroicocephalus ridibundus*, pheasant *Phasianus colchicus*, buzzard *Buteo buteo*, pied wagtail *Motacilla alba*, swallow *Hirundo rustica*, magpie *Pica pica*, carrion crow *Corvus corone*, woodpigeon *Columba palumbus*, blackbird *Turdus merula*, lapwing *Vanellus vanellus*, great tit *Parus major*.

4.2.2.5 Amphibians

Three waterbodies were identified within the survey area. The waterbodies were assessed using the HSI assessment (Oldham *et al.* 2000⁴). A summary of the assessment is provided within Table 4.1 with full calculations provided in Appendix A.

⁴ Oldham, R.S., Keeble, J., Swan, M.J., and Jeffcote, M., (2000) 'Evaluating the suitability of habitats for great crested newt (*Triturus cristatus*)' *Herpetological Journal* 10: 143-15.

Table 4.1: Results of HSI assessment of waterbodies within the survey area.

Waterbody	Grid Reference	Description	HSI Result
WB1	SE377067	Located in a fenced area within the sludge lagoon. The waterbody has shallow water and is dominated by bulrush.	0.82 – Excellent suitability for great crested newts.
WB2	SE379066	A small shallow waterbody located on the southern boundary of the sludge lagoon, potentially a result of regular river flooding. Aquatic plants include iris which indicate that this area is regularly wet. Waterbody is in close proximity to the River Dearne therefore likely to contain fish due to inundation from flooding events. There is the potential that the waterbody is ephemeral which may not adversely affect newts, but may affect fish populations.	0.45 – Poor suitability for great crested newts.
WB3	SE380066	A large shallow waterbody located on the southern boundary of the sludge lagoon, potentially a result of regular river flooding. Aquatic plants include bulrush which indicate that this area is regularly wet. Waterbody is in close proximity to the River Dearne therefore likely to contain fish due to inundation from flooding events. There is the potential that the waterbody is ephemeral which may not adversely affect newts, but may affect fish populations.	0.59 – Below average suitability for great crested newts.

Waterbody one is surrounded by constructed/landscaped bunds colonised with tall ruderal vegetation which provide terrestrial habitat for great crested newt (GCN). Waterbodies two and three are prone to inundation from the River Dearne and therefore are likely to have fish present, which is largely inimical to the presence of great crested newts.

4.2.2.6 Reptiles

The habitats immediately surrounding the operational site are largely unsuitable for reptiles due to the large amounts of hardstanding and lack of suitable basking habitat adjacent to shelter (e.g. hardstanding adjacent to amenity grassland). However, the rough tussocky grassland in the proposed construction location and a western portion of the operational site has the potential to provide suitable habitat. The old sludge lagoon to the south of the site has a high potential to support reptiles given the scattered scrub and tall ruderal vegetation. This mosaic of habitats will provide reptiles with refugia, foraging and basking sites.

4.2.2.7 Invertebrates

The dominant habitats on the operational site are hardstanding/buildings, amenity grassland and tall ruderal vegetation. These habitats within the Lundwood site are considered unlikely to support a diverse assemblage of invertebrates due to low botanical diversity, albeit that invertebrate numbers may be high.

The tall ruderal vegetation across the southern half of the site will have higher botanical diversity than the habitats to the north due to the area being left unmanaged. It is therefore assumed that this may provide nectaring and foraging resources for invertebrates.

4.3 Great Crested Newt eDNA survey

Results from the eDNA survey carried out on waterbody 1 are summarised within Table 4.2. eDNA surveys could not be carried out on waterbody 2 and 3 as they had dried-out since the initial survey was carried out in April 2016.

Table 4.2: Results of eDNA survey on waterbody.

Waterbody	eDNA detection
Waterbody 1	Yes
Waterbody 2	Survey could not be undertaken due to pond drying out
Waterbody 3	Survey could not be undertaken due to pond drying out

5 Discussion and Recommendations

The current proposed works involve the construction of a building and related facilities within an area of improved grassland in the middle of the operational site. This also includes a section of tall ruderal vegetation to the east. These areas are not of high conservation value. However, due to the nature of the project being a design and build, it is recommended that an ecologist reviews any new designs that are proposed. This is to ensure the proposed design is not impacting on sensitive ecological receptors/site ecology that may not have been considered within the current scope of works.

5.1 Designations

There is one non-statutory designated site within 2km of Lundwood WwTW. Dearne Valley Park LNR lies approximately 0.9km west of the site. The proposed works do not fall within the SSSI Impact Zones for this site. This reflects the absence of any potential pollution pathways so it is not expected that proposed works will have an impact on this designated sites.

5.2 Habitats

The habitats within the site consist of hardstanding, buildings, tall ruderal vegetation, scrub, improved and amenity grassland, broadleaved trees and standing water. The habitat within the operational area were assessed to be of low botanical value due to low species diversity. However, the broadleaved trees and scrub are likely to provide foraging, commuting and nesting resources for fauna on site.

It is currently proposed that redevelopment works are to be undertaken on existing areas of improved and amenity grassland in the middle of the operational site and areas of tall ruderal vegetation to the east. These are areas of low botanical diversity and therefore removal of these habitats is not expected to affect local flora and fauna.

If the loss of any trees or scrub is required, for example due to access requirements, it is recommended that this habitat type is replaced. This should include the planting of native species in keeping with the surrounding habitats, for example English/pedunculate oak *Quercus robur*, ash *Fraxinus excelsior*, willow spp. and silver birch. It is recommended that the species planted are of local provenance, replacing all trees lost on a 2:1 ratio.

5.2.1 Invasive Species

Himalayan balsam, giant hogweed and Japanese knotweed are present within the Lundwood WwTW site. The proposed working area, as currently defined, is within 100m of a stand of Himalayan balsam (TN4; Drawing 1). These species are listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). A method statement and management plan will be required at this site in order to

avoid the spread of these species off site, which would be considered an offence under the Act 1981.

The survey was undertaken outside of the main growing period, therefore it is recommended that a re-survey of the area is undertaken within the peak growing season to map the extent of invasive species.

5.3 Fauna

5.3.1 Otter

No sign of otter or suitable locations to form holts were identified on site. However the vegetation on the banks of the watercourse in the middle of the site may provide places for otters to shelter. The desktop study identified otter records within 2km of the site. There is the low potential for otters to move into the watercourse due to the connectivity with the River Dearne and use the southern area of the site to rest up.

Otters are fully protected through their inclusion in Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (as amended) and in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under the legislation it is an offence to intentionally capture, kill or injure otters as well as intentionally damage, destroy or block access to their places of shelter or protection or disturb them in a place of shelter or protection.

The proposed works are focused within areas unsuitable for otters; therefore it is not anticipated that works will affect this species. However, if works are to occur within 30m of the watercourse it is recommended that a pre-construction otter survey is undertaken, to check for the presence of any resting places. This should occur two months prior to works commencing. If any resting places were identified, a mitigation licence may be required from Natural England.

5.3.2 Bats

Suitable foraging habitat for bats was identified on site and one of the buildings (TN5; Drawing 1) was identified as potentially being suitable for roosting bats. The current proposed works will not remove foraging habitat for bats. The site is currently partially lit, therefore if works were to include the use of lighting, this is to be kept to a minimum and directionally lit.

British bat species are fully protected through their inclusion in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and in Schedule 2 of The Conservation of Habitats and Species Regulations 2010 (as amended). Under the legislation, it is an offence to intentionally kill, injure or take a bat as well as intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a bat or disturb an animal while it is occupying a structure or place which it uses for that purpose.

If the identified building is to be impacted, directly or indirectly, by the proposed works (e.g. if they are to be modified or removed) it is recommended that a bat activity survey is undertaken by a suitable qualified ecologist following current

survey guidelines.⁵ This assessment will involve dusk emergence/dawn return surveys. The surveyor will watch, listen for and record bats exiting or entering bat roosts during the activity survey. These surveys must be undertaken in suitable weather conditions between April and September. It is recommended that this survey is completed early in the bat survey period to ensure that if bats are found to be present that there is sufficient time to undertake further surveys to characterise the roost. This information would be required for a Natural England licence application.

If a bat roost is identified and will be disturbed by the proposed works, then a bat mitigation licence will be required from Natural England prior to the commencement of works. Natural England take a minimum of 30 working days to process a licence application. In order to obtain a bat licence, appropriate mitigation would need to be developed and implemented and works may be seasonally restricted.

5.3.3 Water voles

The potential presence of water voles on site was identified from the historical surveys and the suitability of habitat recorded during the survey. The current proposed works will not be directly impacting on the watercourse. However, if works are within 15m of the top of the banks of the watercourse, it is recommended that an exclusion zone is erected to reduce the disturbance caused by works within the proximity of the water bank. Additionally, a method statement should be developed detailing how disturbance to water voles will be minimised. If at any time direct impact is proposed on the watercourse, further surveys would be required in accordance with the new guidelines (Dean *et al.* 2016⁶). These guidelines recommend two survey visits to be undertaken on a site; the first from mid-April to the end of June and the second from July to September. These visits should be undertaken at least two months apart.

Water voles are fully protected through their inclusion in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under the legislation it is an offence to intentionally capture, kill or injure water voles as well as intentionally damage, destroy or block access to their places of shelter or protection or disturb them in a place of shelter or protection.

5.3.4 Birds

The scrub and broadleaved trees around the perimeter of the operational site provide suitable habitat for nesting birds. Additionally, areas of habitat including scrub, trees and tall ruderal vegetation adjacent to open areas within the southern half of the site provide potential for ground nesting birds and common birds. However, the area proposed for development provides unsuitable habitat to any nesting birds.

⁵ Hundt, L. (2012). *Bat Surveys: Good Practice Guidelines*. 2nd Edition. Bat Conservation Trust.

⁶ Dean, M., Strachen, R., Gow, D. and Andrews, R. (2016) *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series)*. Eds Fiona Mathews and Paul Chanin. The Mammal Society, London.

Wild birds are protected under Part 1 Section 1 of the Wildlife and Countryside Act 1981 (as amended); they are protected from being killed, injured or captured, while their nests and eggs are protected from being damaged, destroyed or taken.

Any works which are likely to damage a breeding bird nest, for example vegetation clearance or building demolition, should be carried out outside of the bird nesting season (March – August). If works during bird nesting season are unavoidable then areas of suitable habitat must be surveyed by a qualified ornithologist immediately prior to the clearance taking place. If the survey confirms the absence of nesting birds in the working area then works can proceed, providing it is done within three days of the survey. If an active birds' nest is discovered then a 5m exclusion zone will be erected until the young have fledged the nest. As indicated in Section 5.2, any loss of trees or scrub should be replaced after works are complete as part of the site mitigation..

5.3.5 Amphibians

The waterbodies within the survey area (WB1, WB2 and WB3) were assessed to have excellent, poor and below average suitability for GCN, respectively (results of HSI, Table 4.1). The site, adjacent to the River Dearne, is subject to flooding which decreases the likelihood of GCN being present in WB2 and WB3 due to the presence of fish and variation in water levels.

The results from the eDNA survey on waterbody 1 confirm the presence of GCN on site. Therefore a licence will need to be obtained from Natural England prior to the commencement of works. The method statement which accompanies this licence will detail how the site will be cleared of great crested newts and provide details on the mitigation area which will be created for this species. This may include newt fencing and pitfall trapping of the works area. As impacts with the currently proposed works on the newt population will be low, a 30 day trapping period within suitable terrestrial habitat will be required. Trapping can only be undertaken between March and October, when newts are active (night time temperatures consistently above 5°C). Additionally, mitigation for the loss of GCN habitat will be required. Natural England take a minimum of 30 working days to issue a licence, following receipt of an application.

The current proposed works suggest a loss of less than 0.5ha of suitable terrestrial habitat. However, if this area is to increase above 0.5ha, a population size class assessment will be required prior to the application of a licence with Natural England (Table 5.1). This will require six survey visits to be carried out between mid-March and mid-June, with two survey visits being undertaken between mid-April and mid-May. Additionally, if the location in relation to the waterbody is to change, this may also affect the surveys required prior to licence application (Table 5.1).

Table 5.1: Survey Guidance Table.⁷

Impact type and location	Potential terrestrial habitat loss or damage (ha)	Presence/likely absence survey	Population size class assessment	HSI	Maximum age of survey data (#breeding seasons)
No ponds lost or damaged, development within 50m of nearest pond	≤0.01	Yes	No	Yes	3
	>0.01	Yes	Yes	Yes	2
No ponds lost or damaged, development 50-100m from nearest pond	≤0.2	Yes	No	No	3
	>0.2	Yes	Yes	Yes	2
No ponds lost or damaged, development 100-250m from nearest pond	≤0.5	Yes	No	No	4
	>0.5	Yes	Yes	Yes	3
No ponds lost or damaged, development >250m from nearest pond	≤5	Yes	No	No	4
	>5	Yes	No	Yes	3

5.3.6 Reptiles

Suitable habitat for reptiles was identified on the proposed construction location, in the middle of the operational site.

Common reptile species such as adder *Vipera berus*, common lizard *Zootoca vivipara*, grass snake *Natrix natrix* and slow worm *Anguis fragilis*, are partially protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This means it is an offence to intentionally or recklessly kill, injure or take one of these species.

A method statement should be developed and contractors are made aware of their possible presence. A phased cut should be undertaken which involves a first cut down to 10cm followed by a second cut down to the ground. This enables any reptiles within the area to move away. This minimises the chance that individuals are forced into the middle of the area to be cleared and are then killed or injured.

If the currently proposed location of works are to change, an ecologist should be consulted regarding appropriate mitigation for reptiles. This may involve a reptile survey of the new location and the area to be trapped out of reptiles.

⁷ Great Crested Newt Method Statement for EPS licence application [Taken from application form 2016].

6 Conclusions

Based on the current understanding of development the following conclusions are made based on the survey results:

- Invasive plant species: A method statement and management plan is to be implemented to avoid the spread of invasive species off site. A re-survey may be required during the peak season to map the extent of the spread of invasive species on site.
- Otter: If works are to occur within 30m of the watercourse running through the centre of the site, a pre-construction otter survey should be conducted.
- Bats: If the identified building is to be impacted, directly or indirectly, by the proposed works (e.g. if they are to be modified or removed) it is recommended that a bat activity survey is undertaken by a suitable qualified ecologist following current survey guidelines.
- Water vole: If works are within 15m of the top of the banks of the watercourse running through the centre of the site, it is recommended that an exclusion zone is erected to reduce the disturbance caused by works within the proximity of the water bank. Additionally, a method statement should be developed detailing how disturbance to water voles will be minimised.
- Birds: If vegetation clearance is to occur on suitable habitats for nesting birds within the nesting bird season (March to September), a nesting bird survey is to be carried out by a qualified ornithologist immediately prior to the clearance taking place.
- Amphibians: All removal and site clearance in relation to great crested newts is to be executed under a Natural England Protected Species Licence.
- Reptiles: If any vegetation clearance is required, a phased cut should be undertaken to enable any reptiles within the area to move away. Additionally, a method statement should be developed and contractors are made aware of their possible presence

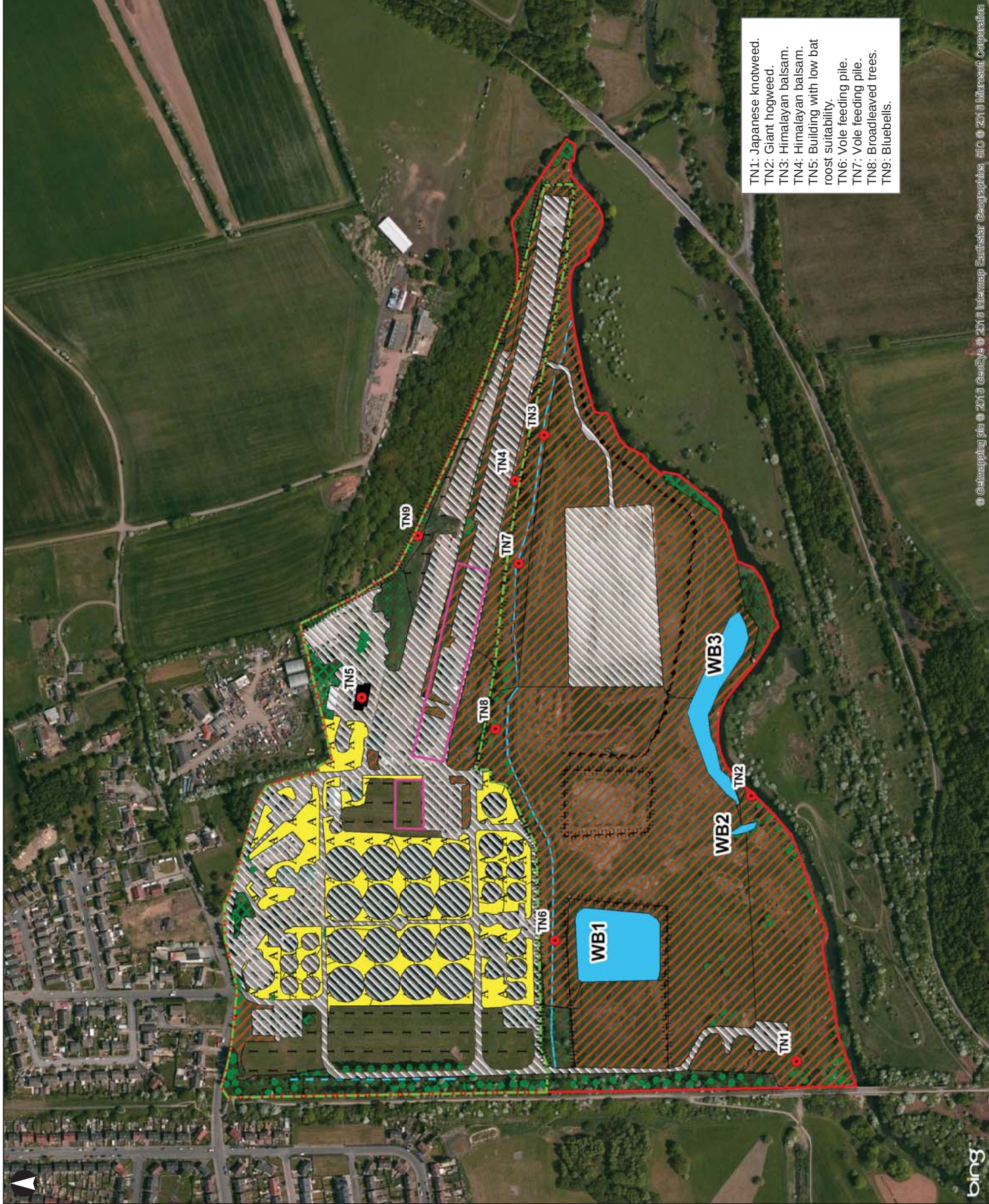
These conclusions are based on the current understanding of the proposed works. However as the project goes forward, it is recommended that an ecologist reviews the updated design in relation to protected species.

This report is the result of survey work undertaken in April and May 2016. This report refers, within the limitations stated, to the condition or proposed development of the site at the time of the inspections. Changes in legislation, guidance, best practice, etc. may necessitate a re-assessment/survey. It is also advised that if there is a delay of over a year in undertaking the works, a re-survey may be required. No warranty is given as to the possibility of future changes in the condition of the site.

This report is produced solely for the benefit of Yorkshire Water and no liability is accepted for any reliance placed on it by any other party. This report is prepared for the proposed uses stated in the report and should not be used in a different context.

Drawings

Drawing 1: Phase 1 Habitat survey map.



TN1: Japanese knotweed.
TN2: Giant hogweed.
TN3: Himalayan balsam.
TN4: Himalayan balsam.
TN5: Building with low bat roost suitability.
TN6: Vole feeding pile.
TN7: Vole feeding pile.
TN8: Broadleaved trees.
TN9: Bluebells.

Legend

- Approximate area of proposed works
- Approximate active site boundary
- Approximate red line boundary

Target note

- A2.1 - Dense scrub
- A2.2 - Scattered scrub
- B4 - Improved grassland
- C3.1 - Tall ruderal herbs
- G1 - Standing water
- J1.2 - Amenity improved
- J3.6 - Buildings
- A3.1 - Broadleaved parkland/scattered trees
- G2 - Running water
- J2.3.2 - Species poor hedge and trees
- J2.4 - Fence
- J2.6 - Dry ditch
- J2.8 - Earth bank
- A2.2 - Scattered scrub
- A3.1 - Broadleaved parkland/scattered trees
- A3.1.1 - Buildings and handstanding

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Client

Yorkshire Water Services

Job Title

Lundwood Waste water Treatment Works

Phase 1 Habitat survey map

Scale at A3

1:3,559

Job No	Drawing Status
247877-00	Issue
Drawing No	Issue
001	P1

Appendix A

HSI Calculation Results

A1 HSI Results

	WB1		WB2		WB3	
	Result	Score	Result	Score	Result	Score
Geographic Location	Zone A	1	Zone A	1	Zone A	1
Area (m ²)	5777	0.8	177	0.4	4595	0.8
Permanence	Sometimes dries	0.5	Dries annually	0.1	Dries Annually	0.1
Water Quality	Moderate	0.67	Poor	0.33	Poor	0.33
Shade	0%	1	91%	0.3	0%	1
Waterfowl	Absent	1	Absent	1	Absent	1
Fish	Possible	0.7	Minor	0.3	Minor	0.3
Pond Count	7	0.65	7	0.65	7	0.65
Terrestrial Habitat	Good	1	Moderate	0.67	Moderate	0.67
Macrophytes	95%	0.85	20%	0.5	70%	1
Habitat Suitability Index		0.8153		0.454		0.5882
		Good		Poor		Below average

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