



Llanwern Rail Facilities - Phase 1 Planning

On-Site and Off-Site Mitigation and Monitoring
Plan

October 2018

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Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	25/09/18	J Bates H Wilcox	M Brewster	EC Probert	Draft Issue for TFW Review Only
B	02/10/18	J Bates H Wilcox	M Brewster C Williams	EC Probert	Pre-Application Consultation Issue

Document reference: 367590-WTD-CAR-2650

Information class: Standard

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1 Introduction

1.1 Project Description

Mott MacDonald Ltd has been commissioned by Transport for Wales (TfW), on behalf of Welsh Government, to prepare and submit a planning application, seeking full planning permission for the design and construction of a 1.6km long Major Events Stabling Line (MESL) on land adjacent to the existing Tata Steelworks Service Lines in Llanwern, South Wales. This is Phase 1 of the Llanwern Rail Facilities Programme.

The MESL will be used for stabling of rolling stock for major events in the area, to enable flexibility for future train requirements, and proving of trains prior to use on the rail network. The MESL will be electrified in a future phase of work. This proposed 1.6km length of MESL to the west of Monks' Ditch was formerly known as Option 6a.

The wider Llanwern Rail Facilities Programme will include an extension of the MESL by circa 2.4km east (to achieve a total length of circa 4.0km), electrification of the MESL, a new Llanwern railway station and passenger line (including Park & Ride and footbridge), and connections to the South Wales Main Line (Relief Lines). The further phases of the project will be the subject of subsequent planning application(s).

The key parameters for the Phase 1 scheme are listed below:

- The site area is 3.1 hectares. This land is contained within the red line boundary shown on the Site Location Plan (Drawing number 367590-MMD-48-XX-DR-C-0001, Appendix A); and
- The site length is approximately 1.6km long and 19m wide.

1.2 Scope of Works

The General Arrangement drawings (Drawing numbers 367590-MMD-48-XX-DR-C-0002 to 367590-MMD-48-XX-DR-C-0005, Appendix A) demonstrate the project scope which includes the design and construction of the following:

- A single track stabling line (MESL) circa 1.6km long;
- Associated earthworks and landscaping; and
- Drainage and other engineering works.

To inform a detailed planning application for Phase 1, a full technical assessment has been undertaken (including ecology, environment, heritage and archaeology) of the site and surrounds. This assessment has fed into the design of the scheme. In relation to this report, a detailed ecological assessment of the proposed development was undertaken, which included the preparation of the Ecological Impact Assessment (EclA). This document forms the main basis of the report, including the detailed findings of the broad ecological surveys for protected species, and the assessment of the impacts to those species in relation to the proposed development. For completeness this document is contained in Appendix B (Report ref 367590-WTD-CAR-2648 Mott MacDonald Ltd, 2018).

1.3 Site Location

The proposed rail development Site is located approximately 8 miles east from the centre of Newport, South Wales.

The site is aligned roughly west – east and bordered by the existing South Wales Mainline to the north and the Tata Steelworks to the south. Along the southern boundary of the steelworks site runs the A4810 which links the M4 from junction 23A at Magor with the A48 at Liswerry (a predominantly residential suburb on the south-eastern side of Newport). The site is more widely bordered by the M4 which runs approximately two and a half miles to the north and the Severn Estuary which lays approximately three miles to the south. The Gwent Levels to the south is a significant area of wetlands.

The existing South Wales Mainline passes north of the proposed site and provides opportunity for transport links for both passengers and freight.

Figure 1: Site Location Plan



Source: OS Open Data

The baseline ecological survey work for this report has been undertaken in respect of the entire woodland (including the site and surrounds), this is shown by the dotted black line as detailed in Appendix A. The survey area was selected prior to the finalisation of Phase 1 of the Llanwern Rail Facilities Programme and is considered to provide important ecology context to the site-specific results. Phase 1 of the planning application is indicated by the red line boundary and is hereafter referred to as the ‘site’.

1.4 Programme of Proposed Works

The proposed programme of works are as outlined in Table 1. These dates are in accordance with Transport for Wales’ current high-level programme for the commission of the Phase 1 works and have been informed by the ecological constraints and mitigation proposals in this document.

Table 1: Programme of proposed works

Task	Dates
Vegetation clearance	TBC following approval from NRW
Site set up	Nov – Dec 2018
Start of construction works	Feb 2019

Task	Dates
Railway line commission	July 2019

Source: Transport for Wales

1.5 Purpose of this Report

The Ecological Impact Assessment (EclA) (Mott MacDonald Ltd, 2018) has identified a number of potential ecological impacts from the scheme and outlines the proposed mitigation approach, which includes a number of on-site measures during construction, management of retained habitats and off-site habitat creation.

This document sets out the details, justification and rationale of the mitigation and monitoring proposals for the scheme, in order to inform the planning application.

This document comprises an integrated landscape and biodiversity management plan (LEMP). The aims of the document are to provide details of the post development management of habitats and species associated with the Project, this includes the following:

- Detailed mitigation for on-site species and habitats during and post-construction;
- Management of the habitats on-site following construction;
- Detailed compensatory planting off-site and the management of this newly created habitat;
- Monitoring of selected European Protected Species post-construction;
- Give advice to the appointed contractor; and
- Initially, this document will be applied to Phase 1 only, but the basic principles can also be applied to Phases 2 to 5 at a later stage.

This report has been written in accordance with the guidelines contained in BS42020:2013 Biodiversity Code of Practice for Planning and Development Chapter 11 – Post development: land management and performance review.

1.6 Relevant Legislation and Planning Policy

Protected species and site legislation is covered within the EclA (Appendix B)

Transport for Wales, working on behalf of Welsh Government can be considered a 'public body' and the Environment (Wales) Act 2016 and Wellbeing of Future Generations Act (2015) applies. This is in addition to European and national Legislation associated with protected species and sites.

Section 6 under Part 1 of the Environment (Wales) Act 2016 introduced an enhanced biodiversity and resilience of ecosystems duty (the S6 duty) for public authorities in the exercise of functions in relation to Wales, otherwise known as the 'Biodiversity and resilience of ecosystems duty' The S6 duty requires that public authorities must seek to maintain and enhance biodiversity so far as consistent with the proper exercise of their functions and in so doing promote the resilience of ecosystems.

The Well-being of Future Generations Act became law in April 2015 and is concerned with improving the social, economic, environmental and cultural well-being of Wales. Public bodies must have regard to this Act in all of its functions. Of relevance to this plan is the Resilient Wales goal - '*A nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change (for example climate change).*'

To ensure Transport for Wales complies with their statutory biodiversity duties, this mitigation strategy has been written with the relevant legislation in mind.

Newport City Council's Supplementary Planning Guidance (2015) General Development Principle GP5 – Natural Environmental states that development will be permitted where, as applicable:

- The proposals are designed and managed to protect and encourage biodiversity and ecological connectivity, including through the incorporation of new features on or off site to further the UK, Welsh and/or Newport Biodiversity Action Plans; and
- The proposals demonstrate how they avoid, or mitigate and compensate negative impacts to biodiversity, ensuring that there are no significant adverse effects on areas of nature conservation interest including international, European, national, Welsh Section 42 (now superseded by Section 7 of the Environment (Wales) Act 2016) and local protected habitats and species, and protecting features of importance for ecology.

The local development plan is informed by a number of supplementary planning documents including the following of relevance to biodiversity and nature conservation:

- Newport City Council Supplementary Planning Guidance for Wildlife and Development (Newport City Council, 2010) provides further advice on development within the catchment relating to wildlife including:
 - The requirement to avoid negative impacts by designing around the wildlife features; – To mitigate for any negative impacts on wildlife features; and
 - If it is not possible to avoid or mitigate for certain wildlife features on a site, on or off-site compensation is required.
- Newport City Council Supplementary Planning Guidance for Trees, Woodland, Hedgerows and Development Sites (January 2017) provides further advice on development relating to trees, woodland and hedgerows including:
 - The requirement for tree planting or retention of trees; and
 - That development does not result in the unacceptable loss of or harm to trees, woodland or hedgerows that have wildflower or amenity value.

2 Mitigation and Monitoring Strategy Framework

TfW as a public body also has a requirement under the Environment (Wales) Act and the Wellbeing Being of Future Generations Act to consider biodiversity in all of its functions. This is a requirement which is in addition to the need to comply with European and national protected species and sites legislation.

As the proposed scheme will involve loss of existing woodland, it is proposed to purchase an off-site parcel of land and create woodland habitat as compensation to mitigate the permanent loss occurring due to the scheme. It is proposed to undertake replacement planting at a ratio of 2:1 as requested by Natural Resources Wales (NRW). The created woodland will be designed to be suitable over time to support the protected species identified during the survey work. This will include improvements to connectivity throughout the various phases of the scheme.

2.1 Habitats and Species

The mitigation strategy is to ensure that where possible, habitats and species are taken into consideration at all stages of the development and appropriate mitigation is included in the scheme design, including enhancement and also monitored post construction.

2.2 Post Construction Monitoring and Management

TfW are responsible for ensuring that the monitoring and management of the habitats and species are followed according to professional recommendations. This includes ensuring that adequate funding is requested and secured to follow through with the mitigation and monitoring agreed with NRW and the Planning Authority through the planning process.

2.3 Rationale for the Maintenance of the Woodland

The existing woodland was planted approximately 60 years ago to provide screening for Llanwern village from the steelworks. This has been allowed to mature without any management (apart from general maintenance by Tata Steel) since planting and as such trees are shallow rooted with an understorey dominated in areas by Himalayan balsam (*Impatiens glandulifera*). Whilst protected species have been identified on site the area is not considered to be optimal for those species (EclA, Appendix B).

Management of the woodland is proposed for 30 years, during this time the prescriptive measures for both existing and new woodland are outlined in this plan. The proposed measures will allow the woodlands to mature to a favourable condition for protected species.

3 Ecological Baseline

3.1 On-site Ecological Baseline

A suite of ecological survey work has been undertaken in respect of the following:

- Phase 1 habitat survey (Ref: 367590-WTD-CAR-2604)
- Badger (Ref: 367590-WTD-CAR-2624);
- Bats (roosting and activity surveys) (Ref: 367590-WTD-CAR-2616);
- Dormice (Ref: 367590-WTD-CAR-2614);
- Water vole and otter (Ref: 367590-WTD-CAR-2625);
- Breeding birds (Ref: 367590-WTD-CAR-2645);
- Great crested newt (Ref: 367590-WTD-CAR-2615);
- Reptiles (Ref: 367590-WTD-CAR-2617); and
- Invertebrates(Ref:367590-WTD-CAR-2644).

The findings of these surveys where they relate to this report are summarised below, whilst full methodology and results are detailed in separate reports. These reports are summarised in the EclA (Appendix B).

3.1.1 Habitat

Full details of the habitat within the survey area is documented within the Llanwern Preliminary Ecological Appraisal (Report Reference: 367590-WTD-CAR-2604).

The current habitats within the survey area include; Broad-leaved plantation woodland, dense scrub, tall ruderal vegetation, marginal vegetation, standing water (in the form of reens), running water (Monks' Ditch), ephemeral/short perennial, earth bank, bare ground and hardstanding. Buildings and fences were also recorded within the survey area.

Photographs of the typical habitat within the survey area are included in Photo 1-5 below:

Photo 1: Monks' Ditch and Sluice gates



Photo 2: Typical Reen within the survey area



Source: Mott MacDonald Ltd

Photo 3: Woodland habitat



Source: Mott MacDonald Ltd

Source: Mott MacDonald Ltd

Photo 4: Wet woodland



Source: Mott MacDonald Ltd

Photo 5: Bare ground and ephemeral / short perennial habitat



Source: Mott MacDonald Ltd

3.1.2 Species

A broad range of ecological surveys were undertaken between July 2017 and September 2018. A number of protected species were recorded within the survey area and within 250m of this boundary including; breeding birds (including Schedule 1 birds), bats (roosting, foraging and commuting), badgers, dormice, water vole, great crested newts and reptiles. Otters were not recorded during the surveys; however, Monks' Ditch is a known SINC for otters and therefore precautionarily it is considered that this feature may be used for foraging and commuting. Nationally scarce invertebrates were also recorded.

3.2 Off-Site Compensatory Land

As part of the mitigation strategy, an area of land outside of the site has been identified for

woodland planting (henceforth referred to as 'the off-site compensatory land'; see Appendix E for location). This area was also subject to a Phase 1 survey, the results of which are set out within the technical note (Appendix C) and summarised below.

The off-site compensatory land is mainly a mixture of marshy, improved and semi-improved grassland and is used to graze sheep and horses. The compensation site covers an area of approximately 20.0ha and is located 0.8km north of the Llanwern Steelworks at OS Grid Reference ST 38496 88269. The site is situated adjacent to the existing Tata Steel owned reservoir.

To the south of the site there is a grassland designated as a Site of Nature Conservation Interest (SINC), known as Craig-Y-Perthi Field, which has been purposely excluded from the proposed mitigation area, as this would involve a variation in the designation of the site.

Two woodlands are located to the north and north-west (Routes and Great Woods respectively) of the compensatory land. The woodlands mostly comprises native species such as oak, silver birch (*Betula pendula*), ash (*Fraxinus excelsior*), beech (*Fagus sylvatica*) as well as sycamore (*Acer pseudoplatanus*). The visible understorey comprises hazel, hawthorn and holly (*Ilex aquifolium*) with ground flora present including woodruff (*Galium odoratum*), dog's mercury (*Mercurialis perennis*), ivy (*Hedera helix*) and lord's-and-ladies (*Arum maculatum*). This Routes Wood is an ancient semi-natural woodland which is also designated as a SINC.

4 Ecological Mitigation

Full detail of the impacts of the works on individual species are provided within the EclA (Appendix B). The following sections identified the proposed mitigation during and post construction for both the on and off-site areas.

On-site mitigation proposed below has been designed to cover the loss of woodland habitats. The off-site mitigation has been developed to provide compensation planting (at a ratio of 2:1) which will create additional habitat for a variety of species, however focused on the creation of suitable dormouse habitat to the north of the proposed site on land owned by Tata Steel Ltd. The current site is a mixture of marshy, improved and semi-improved grassland (used to graze sheep and horses) and it is proposed to connect the broad leaved woodland habitats to ensure that there is no net dormouse habitat loss in the long-term.

Approximately 5.8ha of planting has been proposed for the woodland site to mitigate for 2.9ha of habitat on site that will be lost. Planting is proposed to start after a contractor is appointed and well progressed by February 2019. The proposed areas for the mitigation planting are outlined in the drawings in Appendix E.



The planting schedule for this site is outlined in Section 5 of this report.




In addition to the woodland habitat, there may be creation of additional reens on site, which would support aquatic species in the area. These will follow the recommendations provided in the following section.

4.1 Breeding Birds

The on-site woodland has a large number of common and some notable breeding birds (please refer to the Breeding Bird Survey Report 365790-WTD-CAR-2645). A method statement has been prepared for mitigation during construction (Breeding Birds Method Statement (Document number:367590-WTD-CAR-2660) which is contained within Appendix D. To mitigate for the loss of habitat for these new planting is proposed off-site (as described above) and on-site mitigation includes the installation of bird boxes as detail below:

Table 2: Bird boxes to be installed

Bird species	Number of boxes	Location	Type of box
Small tit species such as blue tits, coal tits and marsh tits.	10	These boxes will need to be installed on suitable trees throughout the site.	Apex box 25mm hole 
Larger tit species such as great tit, coal tit and other bird species such as house sparrow, nuthatch and pied flycatcher	10	These boxes will need to be installed on suitable trees throughout the site.	Apex box 32mm hole 

Bird species	Number of boxes	Location	Type of box
Tree Creeper	4	These boxes will need to be installed on suitable trees throughout the site.	Schwegler 2BN 
Redstarts, robins, wrens and sparrows	4	These boxes will need to be installed on suitable trees throughout the site.	Schwegler 1N 
Small tit species such as blue tits, coal tits and marsh tits.	10	These boxes will need to be installed on suitable trees throughout the site.	Apex box 25mm hole 

Source: Mott MacDonald and photos courtesy of NHBS and Envisage Wildcare

4.1.1 Schedule 1 Bird Species Mitigation

Cetti's Warbler are considered to be breeding on the SINC site located immediately to the north of the proposed works. The breeding birds surveys did not find any confirmed breeding Cetti's Warblers on site.

Kingfishers have been found on site based on the breeding bird surveys undertaken, they are considered as probably breeding around the Monks' ditch area. No works are planned around the Monks' Ditch at present so no further mitigation is planned for Kingfishers. A toolbox talk is recommended for Schedule 1 birds to be given to the contractors.

4.2 Bats

Surveys undertaken identified 22 bat roosts across the survey area and the following species during automated and activity surveys:

- Pipistrelle species (*Pipistrellus* sp.);
- Noctule (*Nyctalus noctula*);
- Long-eared species (*Plecotus* sp.);
- *Myotis* species;
- *Nyctalus* species
- Serotine (*Eptesicus serotinus*);

- Lesser horseshoe bat (*Rhinolophus hipposideros*); and
- Big bats (*Nyctalus* / *Eptesicus* sp).

As the works will involve the removal of trees which may impact a number of the roosts, the following mitigation for bats will be undertaken:

This work will be conducted under a protected species licence for the destruction, damage or disturbance of any bat roosts on site. The known bat roosts are identified in the Bat Survey Report (365970-WTD-CAR-2616), all of which are transitional roosts. The exact mitigation requirements will be subject to approval by NRW but the below measures are considered to be proportionate and appropriate for the scheme. These will be included in the proposed a bat licence method statement:

- A site-specific tool-box talk should be given to all staff prior to works commencing;
- Replacement roosting features to be installed on site (replacement of bat roosts on a 3:1 basis with box installation on retained trees) and enhancement to include an additional 20 bat boxes, examples of bat boxes are suggested in figure 2. Initially it is suggested that the following bat boxes are installed 20no. Schwegler 2n, 20no. Schwegler 3FN and 10no. Schwegler 1FF or equivalent style boxes. These will be distributed throughout the site, based on the advice of the supervising ecologist;
- Retention of roosting features where possible (limbs or trunks retained and strapped to nearby trees but away from potential disturbance from construction area);
- Ecological supervision of vegetation clearance (including a pre-works check of the tree, section felling and lowering of limbs for inspection by the ecologist); and
- Best practice measures to minimise disturbance such as directional lighting.

In addition, removal of any low bat potential trees should be undertaken following a soft-felling approach (whereby limbs are carefully removed, lowered to the ground and left overnight).

This document will outline woodland management which will benefit bats and their foraging area by increasing the diversity and number of insect prey available.

Figure 2: Examples of bat boxes to be installed

Schwegler 2N

Schwegler 3FN

Schwegler 1FF



Source: Envisage Wildcare

Off-site mitigation will be through habitat creation and increased foraging areas for bats.

4.3 Dormice

Detailed dormice mitigation is as outlined in the Dormouse Mitigation Strategy (Document Number: 367590-WTD-CAR-2649).

In summary, on-site mitigation measures will involve enhancement of the existing woodland through the effective management. This will be undertaken by improving the structure of the woodland and installation of 50 dormouse boxes. Off-site mitigation will involve the planting of the new area of woodland with dormouse preferential species and improving connectivity to other woodland areas. In addition, 100 dormouse boxes will be placed within the new woodland.

4.4 Otter

Prior to the construction, it is recommended that a site walkover is undertaken to ascertain if otters are using the site. This should be undertaken a minimum of 12 weeks prior to the start of construction. The construction team should be made aware of their potential presence and contact an ecologist if they are seen on site. No off-site mitigation is proposed for otter.

The measures below are advised for incorporation into the detailed design to ensure any impacts on otters that may potentially be using the area are mitigated for. The recommendations below are taken from the Design Manual for Roads and Bridges (DMRB HA81/99):

- Culverts normally used on site are cylindrical. These pose a danger for otters as in times of heavy flow they fill rapidly and the available air space is reduced. The design for any culvert should allow for plenty of air space above the water in periods of flood;
- If the design of the culvert above is not possible then there should be an underpass installed adjacent to the culvert within 50m and above possible flood levels. The underpass should use a cylindrical pipe of 600mm diameter for up to 20m. If the pipe needs to be longer than 20m then the pipe size should increase in diameter to 900mm to ensure that the otters will not be deterred from using the pipe. The pipe joints should be sealed to avoid water seepage; and
- Otter ledges can be used, either designed into large oversized culverts or as additions to an existing culvert. The ledges will need to be a minimum of 500mm wide and be accessible from the bank via existing bank levels or with the installation of a ramp. The ledge should be installed a minimum of 150mm above the highest water level and allow for 600mm of headroom.

4.5 Water voles

Evidence of the presence of water voles has been recorded within the site and 250m of the site (in Monks Ditch), including at least five potential burrows and two potential feeding stations. No works are planned in any of the areas where water voles are known to be present. It is recommended that a site walkover is undertaken a minimum of 12 weeks prior to the start of the construction in order to check for presence of burrows in the working area. In the unlikely event that an active water vole burrow is recorded during the pre-works walkover within the area to be affected by the works, an ecologist should be contacted to advise on suitable avoidance measures or NRW should be consulted and mitigation will be agreed prior to works commencing on-site. No off-site mitigation is proposed.

As guidance (Water Vole Mitigation Guidance 2016), the following is recommended for the design of any culverts:

- Oversized box culverts of up to 30.0 to 35.0m in length are recommended and should have at least 1.0m of headroom above normal water levels; and

- Circular culverts up to 10.0m in length, a diameter of 1200mm should have at least 300mm of headroom above normal water levels.

Maintenance of the Monks Ditch needs to consider the presence of otters and water voles and appropriate measures undertaken to ensure that their fully protected status are taken into consideration.

4.6 Great Crested Newts

Given the risk of encountering great crested newts on-site, vegetation clearance works will require a licence from NRW to allow the removal of suitable terrestrial habitat.

This would require mitigation to be implemented, which would be subject to approval by NRW but is likely to include:



- A site-specific tool-box talk should be given to all staff prior to works commencing;
- Supervision of any clearance, dismantling of suitable newt refugia and fingertip search (as needed) prior to works;
- Creation of refugia in the form of 20 log piles within the retained woodland and edge habitat as detailed within the next section for reptiles.

No off-site mitigation has been proposed, however the creation of connective features and woodland would support this species.

4.7 Reptiles

Reptiles were identified on site during the survey period. A method statement has been prepared for the construction phase of the scheme. As mitigation, it is proposed to install a minimum of 20 refugia throughout the Phase 1 site outside of the construction boundary on the woodland edge habitat. These will include the following:

Table 3: Reptile Mitigation

Type of mitigation	Numbers	
Log piles	10	
Brash piles or windrows	10	

Source: Mott MacDonald Limited




The creation of the woodland habitats and connective features off-site will provide additional habitat.

4.8 Invertebrates

The surveys undertaken throughout the site identified a number of important invertebrate species. Through habitat loss and ground clearance, there may be an impact on invertebrates as they are directly dependent upon deadwood habitats. On-site mitigation would include the following invertebrate mitigation:

- Brash piles to create deadwood and also to provide refuge for invertebrates;
- Standing deadwood and fallen deadwood to be left *in-situ* where safety allows as this provides habitat for invertebrate species such as hoverflies, parasitoid wasps and beetles on site. The interaction of the invertebrates and the deadwood provide a direct ecosystem service through nutrient recycling, soil creation and prey sources for other species;
- In the wetter areas of the site, leave submerged and semi-submerged timber as it is a valuable habitat for hoverflies and craneflies;
- Specialist surveys have identified [with identification on-going] nationally scarce invertebrates including *Anobium inexpectatum*, *Meligethes fulvipes*, *Eupeodes nielsenii*, *Chorisops nagatomii* and *Hippodamia variegata*. These species use ivy stems, plants from the Brassicaceae and the Umbelliferae family and ex-industrial habitats respectively. As a result any recommended seed mixes for grassland areas should contain seed from the Brassicaceae and Umbelliferae family; and
- Install insect boxes (as in table 4).

Table 4: Insect boxes to be installed

Insect species	Number of boxes	Location	Type of box
Bees	10	These need to be installed on trees on the outer edge of woodland.	Bee tubes with plug 
Bees, lacewings and ladybirds	10	These need to be installed on trees on the outer edge of woodland.	Insect Block 
All varieties of insects	20	To be made up out of cut trees on site and left around the site for insects to use.	Insect logs 

Source: Photos courtesy of NHBS and Envisage Wildcare

Through time the off-site woodland will generate suitable habitat to support a wide variety of invertebrates.

4.9 Badgers

A method statement for badgers has been created (Appendix D) to provide guidance to support the Contractor during construction. The creation and management of the woodland habitats will encourage the use of the site by badger.

4.10 On-Site Reen Mitigation

If works proposed to extend some culverts and alter some of the reen alignments within the site to enable the railway to be constructed. This includes raising the levels of the ground in some areas which may require extensions of the culverts.

4.10.1 Creation of Reens

In order to ensure the reens within the site continue to function for biodiversity, reen creation / extensions will include the following:

- The design will take into account the geology of the site so that the ditch will hold water;
- New reens should be designed appropriately but as a minimum should have sides which are 30-45° and be at least 1m deep;
- Reens should be created with gently sloping margins that contain areas of water which are 300mm or less;
- New reens will have contain high nutrient levels and as such should not be connected to the reen system until some vegetation has been established to help stabilise the nutrient levels; and
- The reens should be left to naturally colonise for nearby waterbodies.

4.11 Post Construction

4.11.1 Bats

Post construction mitigation will be implemented through the management of both the on and off-site woodlands throughout the agreed 30-year management period. If any suitable bat features or known roosts are identified during the management of the woodlands, ecological advice should be sought. If trees are to be felled that contain roosts, then a European Protected Species licence for bats will be required to undertake the works.

Connectivity of the woodland is to be maintained for bats for the 30 years of post-construction management. The site has a network of reens and ditches throughout the site that feeds into the Gwent Levels Site of Special Scientific Interest (SSSI). These watercourses are rich in biodiversity and as such provide a good foraging area and commuting route for bats.

4.11.2 Dormice

Dormice mitigation is as outlined in the Dormouse Mitigation Strategy (Document Number: 367590-WTD-CAR-2649).

In summary, we have proposed on-site and off-site mitigation to the north of the site. This includes planting (both on the current site and off-site areas), woodland management (as further outlined in this document), additional boxes and hibernacula to be installed on site.

4.11.3 Invertebrates

The habitat is to be maintained for invertebrates. This will include regular maintenance to ensure that the preferred plant species are retained and are not lost. The maintenance of the edge habitats around the site and woodland edge so it is medium to tall vegetation will help to ensure floristic diversity and as a result, ensure that the invertebrate populations are maintained and improved. The grassland areas around the railway line should be cut on a rotational basis and purposely cut the height so that it allows a varied habitat.

4.11.4 Management of the reens

The reens should not be managed until there is a good level of vegetation cover from plants that have colonised the reens. Once vegetation has a good coverage then maintenance can proceed by carefully de-weeding the reen between October and March. Uprooted vegetation should be disposed of evenly within 5m of the reen and should avoid placing the vegetation along the ridges or raised banks of the reen.

Frequent checks should be made to ensure that there are no invasive aquatic species are present, if they are present then advice should be sought from an ecologist on how to manage the invasive species.

5 Planting Schedule for On and Off Site

The planting schedule for both on and off site has been created for the direct adoption of the Contractor. The associated planting plans are appended in Appendix E.

5.1 General

Prior to planting and/or excavation, the Contractor must establish the position and nature of all services. Carefully hand dig in the vicinity of underground service runs. The Contractor must apply for and obtain all consents and licences from statutory undertakers as necessary. Any damage caused to service runs by the Contractor shall be made good at his own expense.

Undertake works in suitable weather conditions, avoiding frosts and excessively dry, cold and windy conditions. Ensure soil is sufficiently dry when excavating and moving to avoid damaging its' structure.

5.1.1 Plant Supply

- All plants shall be supplied to the relevant parts of BS 3936 Parts 1 (1992) and 4 (1984). Stock shall be materially undamaged, sturdy, healthy and vigorous, of good shape and without elongated shoots, and free from pests and diseases, discolouration, weeds and physiological disorders. Plants shall have been grown in a suitable environment and hardened off. The root system shall be to the requirements of the National Plant Specification and balanced with the branch system;
- All container grown material shall have been grown in the container at least one full growing season prior to delivery and show substantial new root growth, holding the planting material in place but without signs of being pot-bound or waterlogged;
- Lifting, packaging and transporting shall be to CPSE (Committee for Plant Supply and Establishment) 'Handling and establishing landscape plants' (obtainable from the Horticultural Trades Association) Part I, Part II, and Part III, paragraphs 1.3.3 to 1.3.6. 3.0 and 4.0; and
- The Contractor shall identify, reject and replace with suitable material, any plants misshapen or struggling to survive because of damage prior to, or at, planting.

5.2 Tree and Shrub Planting

- Planting shall be carried out between November and March, but not during periods of frost or drying winds;
- Prior to planting the trees and shrubs, all brambles within the planting area will be cut to ground. Do not apply herbicide. Remove arisings and dispose of off-site;
- Spread granular slow release fertiliser over all woodland planting areas prior to planting at the manufacturer's recommended rates. Do not apply to retained grassland areas;
- Plant numbers should be calculated at a density of 1 plant per m² for woodland and woodland edge, and 1 plant per 3m² for low density woodland edge. Plant locations are to be offset by 1.5m from all boundaries and adjacent features;
- Planting is to be undertaken in a random manner, avoiding equal spacings and grids. All plants are to be planted in species groups of 3 apart from *Hedera helix* and *Lonicera periclymenum* which should be planted immediately adjacent to trees, concentrating on those in staked tree pits;

- Prior to removal from containers, all container plants shall be thoroughly watered and allowed to stand for a minimum of 30 minutes;
- All roots of bare rooted material shall be thoroughly immersed in an anti-desiccant solution such as Alginure Root Dip, (or similar);
- Planting shall be either in pits or via notches. Where notch are to be planted, the entire root system must be covered, and completely firmed and consolidated at planting. Where plants are to be pit planted, holes shall be dug of sufficient size to take the entire root system without excessive bending of the roots. The base of each pit shall be broken up to a depth of 500mm.
- Single tree stakes are to be provided where shown. Stakes shall be whole sections of softwood timber peeled and pressure treated in accordance with BS 4072, 50-75mm top diameter, and of sufficient length to extend to 300mm above ground when driven firmly into the ground. Position on the windward side of the plant, and drive into the base of the pit after breaking up the bottom of the pit and before planting. Secure each plant using a single heavy-duty tree tie and spacer approximately 50mm from the top, secured with a nail (if necessary). The tie should hold the tree in position securely enough to allow wind movement, but not so tightly it chaffs the bark;
- All plants shall be centrally positioned and upright, with finished soil level matching that of the nursery, adequately firmed but not compacted. Damaged top or root growth shall be carefully cut back to live wood;
- Pits shall be backfilled with 80% excavated topsoil and 20% organic material, not containing peat or peat-based material. Slow release fertiliser shall be incorporated into the mix, at the manufacturer's recommended ratios;
- All plants must be watered to field capacity on completion, ensuring soil is completely firmed and consolidated, but not compacted, around roots;
- Securely fix a 600mm grey or black spiral rabbit guard around every stem post planting, firmly rammed into the soil to prevent dislodging. Do not cut off excess guard on plants cut back to 300mm;
- Apart from in glades, treat an area of 1,000mm radius around the base of each staked plant with a selective herbicide developed to treat grass, following the manufacturer's instructions; and
- Remove all arisings, including but not limited to plant cuttings, tags, poles, containers, wrappings, tapes and other packaging and dispose of off-site.

5.3 Stock Proof Fencing

- Fencing will need to be installed on the off-site mitigation area. Fencing should be constructed in straight lines and be strained between strainer posts;
- Strainer posts should be used at each end of the fence and at least every 100.0m (2 nets), at all changes of direction and sudden changes of gradient (especially at the bottom of dips/hollows);
- Straining posts are to be dug in to a depth of at least 900mm, properly rammed, firmed (using stones where necessary) and strutted in the line of the fence. Two struts per post should be used on changes of direction except on acute corners of under 90 degrees where a single strut bisecting the angle of turn may be used;
- The point end of the strut should be housed approximately 75-100mm deep into the straining post at a height of 750mm above ground level. The bottom end should be dug into the ground and rest tight on a half stake driven into the ground or a large stone well bedded below ground level.

- Intermediate stakes are to be driven into the ground to a minimum depth of 550mm at 2.7m intervals, in line with the posts;
- Netting should be properly strained and stapled. Staples to be placed on top, 3rd, 5th and bottom wires of the netting on each post. Staples must not be driven fully home on the intermediate posts in order to allow future repair and re-tensioning work. They are to be positioned diagonally to the grain of the wood;
- Single strand wire should be barbed and be properly strained and stapled to the outside of the posts and stakes 125mm above the top of the netting. A second barbed wire above the first may also be used (optional). Use plain wire if adjoining a public right of way;
- Fix an additional single strand wire or piece of netting to the bottom of the fence in hollows and dips. Alternatively gaps below the fence should be filled with site stone or soil to ensure that it is fully stock proof; and
- Fencing should not be strained or attached to gate posts, trees, shrubs or other structures.

5.3.1.1 Materials

- Timber must be round peeled softwood (not spruce) and pressure tanalised to BS 4072, or timber of equivalent quality and durability.
 - Straining posts 2,000mm x 120mm top diameter;
 - Struts 2,000mm x 100mm top diameter;
 - Intermediate stakes 1,700mm x 65mm top diameter, pointed; and
 - longer stakes may be needed in soft or uneven ground conditions.
- Wire must comply to BS 4102 and be galvanised to BS EN 10244-2:2001.
 - Line wire: 4mm (8 swg) plain mild galvanised wire;
 - Barbed wire: Two strand 2.5mm (12½ swg) mild steel galvanised 4 point barbed wire;
 - Staples: 40mm x 4mm galvanised wire staples; and
 - Netting: C8/80/15 galvanised pig netting. Where horses are present use HT 13/122/8 horse netting.

5.4 Planting Schedule for on and off-site mitigation

5.4.1 Woodland Core Trees and Shrubs

Table 5: Woodland Core Trees and Shrubs

Species	Size	Location	%Mix	Number	Plant specific maintenance for 60 months post planting
<i>Acer campestre</i> Maple	1+1 40/60cm height, bare root, notch planted, cut back to 30cm***	Woodland Core	3	1,030	
	1+2 175/200cm height, feathered, bare root*/**/**	Woodland Core	1	343	
	6-8cm girth, feathered, bare root*/**/**	Woodland Core	1	343	
<i>Acer pseudoplatanus</i> Sycamore	1+1 60/80cm height, bare root, notch planted ***	Woodland Core	1	343	
	6-8cm girth, feathered, bare root*/**/**	Woodland Core	1	343	
<i>Betula pendula</i> Birch	1+1 125/150cm height, transplant, bare root*/**/**	Woodland Core	2	686	
	1+2 200/250cm height, transplant, feathered, bare root*/**/**	Woodland Core	1	343	
	6-8cm girth, 25ltr container, feathered*/**/**	Woodland Core	1	343	
<i>Carpinus betulus</i> Hornbeam	1+2 80/100cm height transplant, bare root*/ **	Woodland Core	4	1375	
	6-8cm girth, feathered, bare root*/**/**	Woodland Core	2	686	
<i>Castanea sativa</i> Sweet chestnut	1+1 60/80cm height, bare root, notch planted ***	Woodland Core	5	1,717	
	6-8cm girth, feathered, bare root*/**/**	Woodland Core	1	343	

Species	Size	Location	%Mix	Number	Plant specific maintenance for 60 months post planting
<i>Corylus avellana</i> Hazel	40/60cm height, bare root, notch planted, cut back to 30cm***	Woodland Core	18	6,180	Cut plants back to 300mm above ground between November and March each year cut 20% of the total number of plants across the area, ensuring each plant is cut back once in the 60-month period. Arisings to be left in long lengths and piled neatly across the area.
	1+1 80/100 height transplant, bare root, cut back to 30cm*/***	Woodland Core	2	686	
<i>Crataegus monogyna</i> Hawthorn	40/60cm height, bare root, notch planted, cut back to 30cm***	Woodland Core	18	6,180	Cut plants back to 300mm above ground between November and March each year cut 20% of the total number of plants across the area, ensuring each plant is cut back once in the 60-month period. Arisings to be left in long lengths and piled neatly across the area.
<i>Hedera helix</i> Ivy	15/20cm height, 9cm container, notch planted	Woodland Core	1	343	
<i>Ilex aquifolium</i> Common holly	40/60cm height, 2ltr container*/***	Woodland Core	2	686	
<i>Lonicera periclymenum</i> Honeysuckle	40/60cm bare root, notch planted, cut back to 30cm	Woodland Core	1	343	
<i>Malus sylvestris</i> Crab apple	1+2 80/100cm height, transplant, bare root*/ ***	Woodland Core	6	2,060	
	6-8cm girth, feathered, bare root*/**/***	Woodland Core	4	1,375	
<i>Prunus avium</i> Wild cherry	1+1 60/80cm height, bare root, notch planted ***	Woodland Core	3	1,030	
	1+2 125/150cm height, transplant, feathered, bare root*/**/***	Woodland Core	2	686	
	6-8cm girth, standard, bare root*/**/***	Woodland Core	1	343	

Species	Size	Location	%Mix	Number	Plant specific maintenance for 60 months post planting
<i>Pinus sylvestris</i> Scots pine	2+2 40/60cm height, bare root, notch planted***	Woodland Core	4	1,375	
	125 -150cm height, feathered, hessian root balled**/**/**	Woodland Core	3	1,030	
<i>Quercus robur</i> Common oak	1+2 100/125cm height, transplant, bare root**/**/**	Woodland Core	7	2,403	
	1+2 150/175cm height, transplant, bare root **/**/**	Woodland Core	2	686	
	6/8cm girth, feathered, hessian root balled**/**/**	Woodland Core	1	343	
<i>Taxus baccata</i> English yew	2+2 30/40cm height, bare root, notch planted***	Woodland Core	2	686	
Total			100	34,330	

Source: Mott MacDonald Limited

5.4.2 Woodland Edge Trees and Shrubs

Table 6: Woodland Edge Trees and Shrubs

Species	Size	Location	%Mix	Number	Plant specific maintenance for 60 months post planting
<i>Acer campestre</i> Maple	1+1 40/60cm height bare root, notch planted, cut back to 30cm***	Woodland Edge	3	538	
	1+2 175/200cm height, feathered, bare root**/**/**	Woodland Edge	1	180	
<i>Betula pendula</i> Birch	1+1 125/150cm height, transplant, bare root**/**/**	Woodland Edge	4	718	
		Woodland Edge	2	359	

Species	Size	Location	%Mix	Number	Plant specific maintenance for 60 months post planting
	1+2 200/250cm height, transplant, feathered, bare root**/**/**				
<i>Corylus avellana</i> Hazel	40/60cm height, bare root, notch planted, cut back to 30cm***	Woodland Edge	30	5,380	Cut plants back to 300mm above ground between November and March each year cut 20% of the total number of plants across the area, ensuring each plant is cut back once in the 60-month period. Arisings to be left in long lengths and piled neatly across the area.
	1+1 80/100 height, transplant, bare root, cut back to 30cm**/**	Woodland Edge	20	3,587	
<i>Crataegus monogyna</i> Hawthorn	40/60cm height, bare root, notch planted, cut back to 30cm***	Woodland Edge	10	1,794	Cut plants back to 300mm above ground between November and March each year cut 20% of the total number of plants across the area, ensuring each plant is cut back once in the 60-month period. Arisings to be left in long lengths and piled neatly across the area.
<i>Cytisus scoparius</i> Broom	40/60cm height, bare root, notch planted, cut back to 30cm***	Woodland Edge	5	896	
<i>Rosa canina</i> Dog Rose	40/60cm height, bare root, notch planted, cut back to 30cm	Woodland Edge	1	180	Cut plants back to 300mm above ground between November and March each year cut 20% of the total number of plants across the area, ensuring each plant is cut back once in the 60-month period. Arisings to be left in long lengths and piled neatly across the area.
<i>Malus sylvestris</i> Crab apple	1+2 80/100cm height, transplant, bare root*/ **	Woodland Edge	5	896	
	6-8cm girth, feathered, bare root**/**/**	Woodland Edge	2	359	
<i>Prunus spinosa</i> Blackthorn	40/60cm height, bare root, notch planted, cut back to 30cm	Woodland Edge	10	1,794	Cut plants back to 300mm above ground between November and March each year cut 20% of the total number of plants across the area, ensuring each plant is cut back once in the 60-month period. Arisings to be left in long lengths and piled neatly across the area.

Species	Size	Location	%Mix	Number	Plant specific maintenance for 60 months post planting
<i>Salix caprea</i> Goat willow	1+1 60/80cm height, bare root, notch planted, cut back to 30cm***	Woodland Edge	2	359	Cut plants back to 300mm above ground between November and March each year cut 20% of the total number of plants across the area, ensuring each plant is cut back once in the 60-month period. Arisings to be left in long lengths and piled neatly across the area.
<i>Viburnum lantana</i> Wayfaring tree	40/60cm height, bare root, notch planted, cut back to 30cm	Woodland Edge	5	896	Cut plants back to 300mm above ground between November and March each year cut 20% of the total number of plants across the area, ensuring each plant is cut back once in the 60-month period. Arisings to be left in long lengths and piled neatly across the area.
Total			100	17,936	

Source: Mott MacDonald Limited

5.4.3 Wet Woodland Trees and Shrubs

Table 7: Wet Woodland Trees and Shrubs

Species	Size	Location	%Mix	Number	Plant specific maintenance for 60 months post planting
<i>Acer campestre</i> Maple	1+1 40/60cm height, bare root, notch planted, cut back to 30cm***	Woodland Core	3	1,030	
	1+2 175/200cm height, feathered, bare root**/**	Woodland Core	1	343	
	6-8cm girth, feathered, bare root**/**	Woodland Core	1	343	
<i>Acer pseudoplatanus</i> Sycamore	1+1 60/80cm height, bare root, notch planted ***	Woodland Core	1	343	
	6-8cm girth, feathered, bare root**/**	Woodland Core	1	343	
<i>Betula pendula</i> Birch	1+1 125/150cm height, transplant, bare root**/**	Woodland Core	2	686	
		Woodland Core	1	343	

Species	Size	Location	%Mix	Number	Plant specific maintenance for 60 months post planting
	1+2 200/250cm height, transplant, feathered, bare root**/**/****				
	6-8cm girth, 25ltr container, feathered**/**/****	Woodland Core	1	343	
<i>Carpinus betulus</i> Hornbeam	1+2 80/100cm height transplant, bare root*/ ****	Woodland Core	4	1,375	
	6-8cm girth, feathered, bare root**/**/****	Woodland Core	2	686	
<i>Castanea sativa</i> Sweet chestnut	1+1 60/80cm height, bare root, notch planted ***	Woodland Core	5	1,717	
	6-8cm girth, feathered, bare root**/**/****	Woodland Core	1	343	
<i>Corylus avellana</i> Hazel	40/60cm height, bare root, notch planted, cut back to 30cm****	Woodland Core	18	6,180	Cut plants back to 300mm above ground between November and March each year cut 20% of the total number of plants across the area, ensuring each plant is cut back once in the 60-month period. Arisings to be left in long lengths and piled neatly across the area.
	1+1 80/100 height transplant, bare root, cut back to 30cm**/**	Woodland Core	2	686	
<i>Crataegus monogyna</i> Hawthorn	40/60cm height, bare root, notch planted, cut back to 30cm****	Woodland Core	18	6,180	Cut plants back to 300mm above ground between November and March each year cut 20% of the total number of plants across the area, ensuring each plant is cut back once in the 60-month period. Arisings to be left in long lengths and piled neatly across the area.
<i>Hedera helix</i> Common Ivy	15/20cm height, 9cm container, notch planted	Woodland Core	1	343	
<i>Ilex aquifolium</i> Holly	40/60cm height, 2ltr container**/**/****	Woodland Core	2	686	
<i>Lonicera periclymenum</i> Honeysuckle	40/60cm bare root, notch planted, cut back to 30cm	Woodland Core	1	343	

Species	Size	Location	%Mix	Number	Plant specific maintenance for 60 months post planting
<i>Malus sylvestris</i> Crab apple	1+2 80/100cm height, transplant, bare root*/ **	Woodland Core	6	2,060	
	6-8cm girth, feathered, bare root**/**	Woodland Core	4	1,375	
<i>Prunus avium</i> Wild cherry	1+1 60/80cm height, bare root, notch planted ***	Woodland Core	3	1,030	
	1+2 125/150cm height, transplant, feathered, bare root**/**	Woodland Core	2	686	
	6-8cm girth, standard, bare root**/**	Woodland Core	1	343	
<i>Pinus sylvestris</i> Scots pine	2+2 40/60cm height, bare root, notch planted***	Woodland Core	4	1,375	
	125 -150cm height, feathered, hessian root balled**/**	Woodland Core	3	1,030	
<i>Quercus robur</i> Common oak	1+2 100/125cm height, transplant, bare root**/**	Woodland Core	7	2,403	
	1+2 150/175cm height, transplant, bare root **/**	Woodland Core	2	686	
	6/8cm girth, feathered, hessian root balled**/**	Woodland Core	1	343	
<i>Taxus baccata</i> English yew	2+2 30/40cm height, bare root, notch planted***	Woodland Core	2	686	
Total			100	34,330	

Source: Mott MacDonald Limited

- * Pit planted
- ** Single softwood stake
- *** Spiral rabbit guard

6 Management of the Woodlands

6.1 Long term woodland management

The aim of this management plan is to create woodland with a high species diversity, a mosaic of ages and a multi-storied canopy including plenty of links between different levels of the canopy and undergrowth. Woodland areas should be managed to provide a matrix including areas of early succession and fruiting trees and shrubs preferably in close connection to scrub and understorey vegetation. This will allow for the development of the woodland to encourage biodiversity on site.

Aim to achieve the following across the area:

- a maximum of 10-15 trees with a canopy diameter exceeding 10.0m per hectare;
- a dense shrubby understorey where visibility is blocked beyond 3.0m;
- a very patchy environment, with different shrub ages and shapes;
- a thin, uneven canopy to allow glades to form in areas of increased light;
- allow glades to form to maximum dimensions of 10.0m wide x 50.0m long
- allow individual tree canopies bordering glades to close every 50.0m ensuring touching branches spanning the width of the glade;
- Ensure the vegetation density of the 5.0m strip around woodland edges is not reduced below 80%; and
- Scallop glade edges.

6.2 Operational notes

The following recommendations are to be included in any of the planned maintenance activities:

- Undertake all works between November and March, and in accordance with the specification notes shown on Planting Plan number 367590-MMD-48-XX-DR-0200-0201;
- Carry out all tree felling and pollarding works by tree climbing, sectioning into dimensions easily handled and controlled by a single feller, and carefully lowering the sections to the ground;
- Apart from glades, do not brash or remove undergrowth;
- Apart from diseased growth, leave all arisings neatly piled evenly across the site;
- Avoid clear felling, coppicing and pollarding over large areas but evenly across the woodland, ensuring an even distribution of same species plants remain. Do not coppice understorey shrubs to leave trees growing in isolation; and
- Undertake coppicing, felling and pollarding on a rotational basis as shown in Table 8 below.

Table 8: Long term landscape management table

Management operation	60-month post planting maintenance	Year 5 - 10	Year 10 - 15	Year 15 - 20	Years 20-30
Monitor and control grass and bracken growth		Annually	Annually	Annually	Annually
Check stock proof fencing and repair or replace as necessary to prevent grazing in the woodland		Twice annually	Twice annually	Twice annually	Twice annually
Check for and manage rabbits and squirrels		Annually	Annually	Annually	Annually
Check for and manage plant pests and diseases		Annually	Annually	Annually	Annually
Coppice self - seeded <i>Fraxinus excelsior</i> (ash) every 5 years		Once	Once	Once	Twice
<i>Castanea sativa</i> Pollard 25% of total number to 1.5m above ground level every 15 years			x		x
Coppice 50% of total number every 20 years				x	
Fell 25% of total number when canopy approximately 10m diameter and allow to regenerate from ground every 20 - 30 years					x
<i>Corylus avellana</i> Coppice randomly. Ensure every plant is cut back once in 20 years, allowing a minimum of 7 years regrowth between			1st 25%	2nd 25%	remaining 50%
<i>Hedera helix</i> remove from tree canopies every 5 years		x	x	x	x
<i>Lonicera periclymenum</i> remove from tree canopies every 5 years		x	x	x	x
<i>Sambucus nigra</i> Coppice 50% every 5 years		1st 50%	2nd 50%	1st 50%	2nd 50%
<i>Acer pseudoplatanus</i> <i>Alnus glutinosa</i> <i>Carpinus betulus</i> <i>Prunus avium</i> <i>Quercus robur</i> <i>Salix alba</i> Coppice 50% total number when reach 3m in height approximately every 5 years		x	x	x	x
Fell 50% total number when canopy reaches approximately 10m diameter. Allow to regenerate from ground					x
<i>Acer campestre</i> <i>Betula pendula</i> <i>Malus sylvestris</i> Coppice 50% total number when reach 3m in height approximately every 5 years		x		x	
Fell 50% total number when canopy reaches approximately 10m diameter. Allow to regenerate from ground					x

See plant specific detailed operations on planting plan maintenance table

Management operation	60-month post planting maintenance	Year 5 - 10	Year 10 - 15	Year 15 - 20	Years 20-30
<u>Hedges</u> Cut on a rotational basis. Cut both sides and top into an A shape, allowing light to get to base. Allow crowns of plants butting gates and openings to grow together so cut to enable access beneath but do not cut tops or the side abutting the opening.	1st 25% total length	2nd 25% total length	Remaining 50% total length	1st 25% total length	2nd 25% total length
Monitor and gap up lengths over 1.5m using <i>Corylus avellana</i> and <i>Crataegus monogyna</i> , 40/60cm, bare root, notch planted, cut back to 30cm. Plant at 30cm centres, in 2 staggered rows, 45cm apart. Securely fix a 60cm grey or black spiral rabbit guard around every stem post planting, firmly rammed into the soil to prevent dislodging. Do not cut off excess. Protect from grazing by erecting stock proof fencing both sides securely fixed to adjacent fencing. See specification on Planting Plan number 367590-MMD-48-XX-DR-0200-0201.	x	x	x	x	x

Source: Mott MacDonald Limited

7 Monitoring

The monitoring outlined below outlines measures for the mitigation measures for planting and for dormice and bats. The aim of the on-site monitoring is to demonstrate an improvement on the current condition of the woodland and to improve the species diversity and abundance. The aim of the off-site monitoring is to check if the mitigation is successful and that dormice are using the site.

7.1 Planting

In early September of each year following the completion of the planting the area subject to new planting as a result of the proposed works will be inspected and all plants which are missing, damaged, have died, or are failing to make satisfactory extension growth shall be replaced in the next planting season immediately following the inspection. Replacement plants shall, in all aspects, be the same as the original stock at the time of planting, except that it shall be an additional year older for each year that has elapsed since the original stock was first planted. Replacement planting will be undertaken in accordance with the planting conditions detailed within this document. All plants removed shall be taken to a tip off site. Diseased plants shall be appropriately disposed of. Following replacement planting, any stakes, ties, tubes or guards shall be refixed/replaced to the original specification. Plants and planting areas shall be maintained for 30 years after planting.

7.2 Dormice Monitoring

Dormouse boxes will be installed by the licensed ecologists or their accredited agent for 10 years post construction on both on-site and off-site. The boxes will be checked within the active season (April- October) on a bi-monthly basis between April and October inclusive in years 1, 2, 3, 5 and 10. The boxes will be checked for the presence of dormice and, if dormice are found, they will be weighed and gender assessed before being replaced in the box. Weighing of dormice will use a suitable holding bag and a Newton meter. The number, distribution and physical health of the dormice present will be used to identify if any supplementary mitigation is required.

Before the start of each monitoring season all boxes will be cleaned out (if necessary) along with any box maintenance such as new attachment to the tree or box replacement. All nests, including dormouse, will be removed from the boxes during the pre-monitoring period.

If during the breeding season a box contains a mother with young the lid will be replaced and no further data capture for monitoring will be undertaken on that box for that month. Recording will also note if other species have utilised the box other than dormice and, if the nest is abandoned, it will be removed from the box. Only dormouse nests will be left in boxes during the season regardless of presence of dormice, all other nests will be removed.

The above on-site measures will aim to demonstrate an overall increase in numbers and distribution of dormice throughout the site.

The off-site monitoring will be undertaken when there is evidence of fruiting hazel, nut searches for characteristic dormice chewed nuts should be undertaken for 5 years after this time.

7.3 Bat Box Monitoring

It is proposed that bat boxes will be monitored in twice a year in years 1, 2, 3 and 5 and maintained for up to 5 years post construction. This will aim to achieve a greater number and diversity of bat species using the site. After this time, it is suggested that the boxes are left to naturally deteriorate as would happen in a natural feature within the woodland.

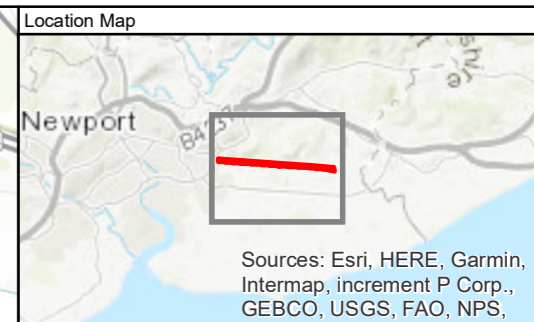
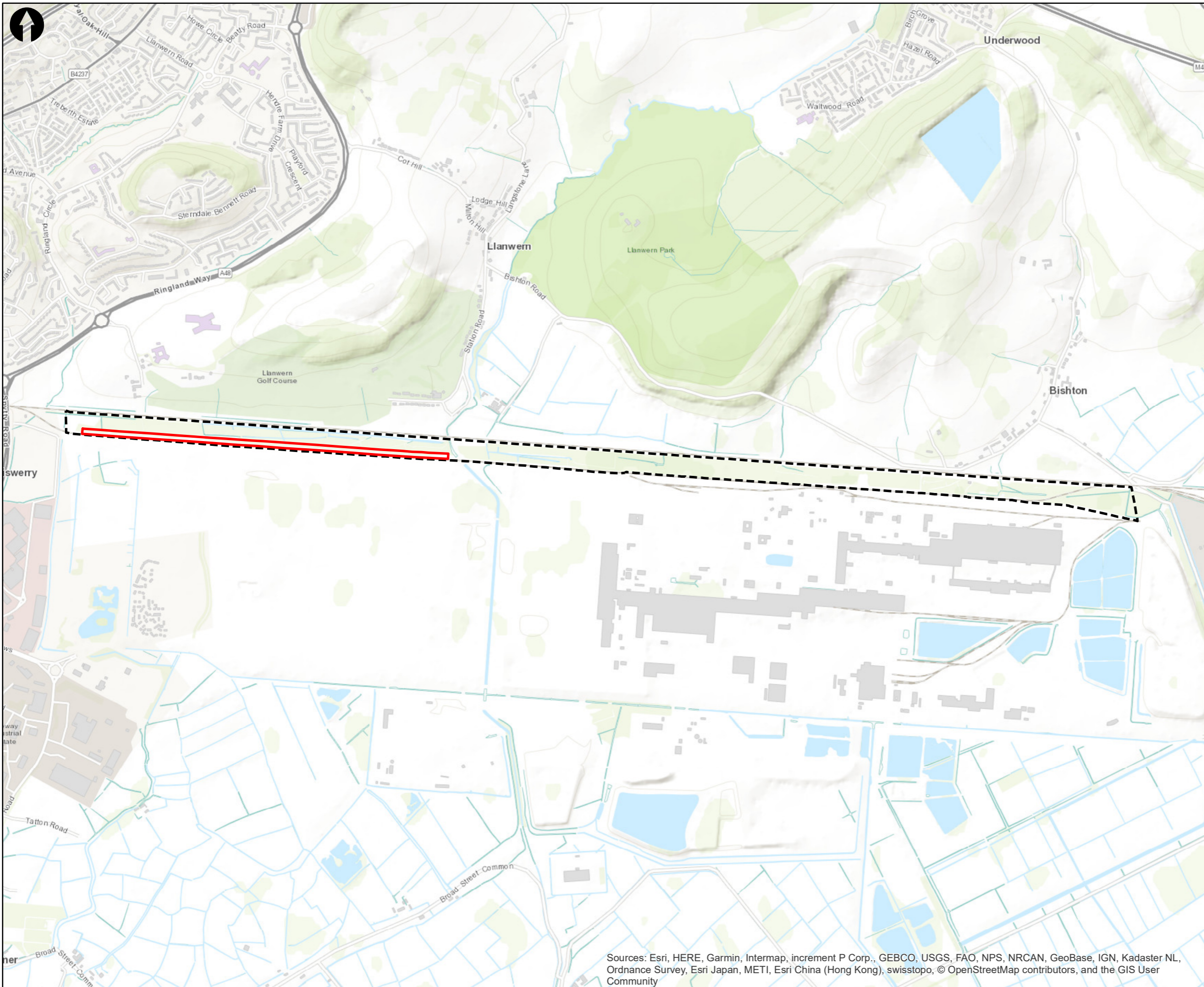
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A. Site Survey Drawing



Key to Symbols

	Site extent
	Survey area

Notes

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Rev	Date	Drawn	Description	ZCM	XX
P1	24/09/18	TR	For information	ZCM	XX

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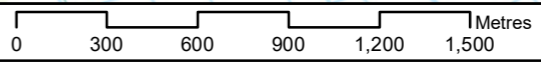
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South Wales Metro - Task Order 26
 Llanwern Site Location Plan

Designed	Z Costas	ZC	Eng. Check	Z Costas	ZCM
Drawn	T Ruff	TR	Coordination	L Woolley	LKW
GIS Check	G O'Donovan	GO	Approved	XX	XX
Scale at A3	Status	Rev	Security		
1:25,000	INF	P1	STD		

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community



B. EcIA



Llanwern Rail Facilities - Phase 1 Planning

Ecological Impact Assessment

September 2018

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Ecological Impact Assessment

September 2018

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	24/09/2018	Z. Costas-Michael	L. Woolley	C. Probert / J. Bates	Draft Issue – For TFW Review Only
B	28/09/2018	Z. Costas-Michael	L. Woolley	C. Probert / J. Bates	Pre-Application Consultation Issue

Document reference: 367590-WTD-CAR-2648

Information class: Standard

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Executive Summary

Mott MacDonald has been commissioned by Transport for Wales (TfW), on behalf of Welsh Government, to prepare and submit a planning application, seeking full planning permission for the design and construction of a 1.6km long Major Events Stabling Line (MESL) on land adjacent to the existing Tata Steelworks Service Lines in Llanwern, South Wales. This is Phase 1 of the Llanwern Rail Facilities Programme. The Site lies within the City of Newport and is centred at Ordnance Survey Grid Reference ST 36907 87302.

This Ecological Impact Assessment (EclA) provides an assessment of nearby designations as well as the protected and/or notable habitats and species which occur (or have the potential to occur) in or near to the Site and may be impacted by the Scheme. The report has been produced in line with the Chartered Institute of Ecology and Environmental Management guidance (CIEEM, 2018).

The ecological survey work for the baseline sections of this report has been undertaken in respect of the entire woodland (including the site and surrounds), this is shown by the dotted black line as detailed in Appendix A. The survey area was selected prior to the finalisation of Phase 1 of the Llanwern Rail Facilities Programme and is considered to provide important ecology context to the site-specific results as discussed within the impact assessment. Phase 1 of the planning application is indicated by the red line boundary and is hereafter referred to as the 'Site'.

Consultation has been undertaken with both Natural Resources Wales (NRW) and Newport City Council (NCC) ecologists in order to agree the scope and proposed methodology of the baseline ecological survey work undertaken; to identify the key ecological features being considered under the assessment; and to ascertain the outline mitigation and compensation strategy to be proposed.

A total of five statutory designated sites were identified within 2.0km of the survey area including, one Special Area of Conservation (SAC) and four Sites of Special Scientific Interest (SSSI). In addition, six SACs designated for bats have also been identified within 30.0km of the survey area. A Habitat Regulations Assessment (Stage 1) has been undertaken (detailed within a separate document) which concluded that the scheme would have no likely significant effects for the statutory designated sites within 2.0km or bat SACs within 30.0km. A total of 26 non-statutory designated sites were identified within 2.0km of the survey area. All of these sites were designated as Sites of Importance for Nature Conservation (SINC), including two adjacent to the survey area (Ringland Way Marsh and Greenmoor Pool), and one within the survey area (Monks' Ditch).

The broad habitats types within the survey area are broad-leaved woodland with dense scrub, tall ruderal vegetation, ephemeral/short perennial vegetation, marginal vegetation, standing water (in the form of reens) and running water (Monks' Ditch). The invasive plant species Himalayan balsam (*Impatiens glandulifera*) and Virginia creeper (*Parthenocissus quinquefolia*) have also been recorded on throughout the survey extent. The habitats within the survey boundary were classified to be of low to moderate ecological value. From a habitat perspective, the woodland forms a long, linear corridor and offers suitable habitat for a range of wildlife species (including protected species) and is therefore considered to be of local value

A broad range of ecological surveys were undertaken between July 2017 and September 2018. A number of protected species were recorded within the survey area and within 250m of this boundary including; breeding birds (including Schedule 1 birds), bats (roosting, foraging and

commuting), badgers, dormice, water vole, great crested newts and reptiles. Otters were not recorded during the surveys; however, Monks' Ditch is a known SINC for otters and therefore precautionarily it is considered that this feature may be used for foraging and commuting. Nationally scarce invertebrates were also recorded. The Site is considered to be of site value, local value and borough value for various protected species.

The impact of the Scheme on designated sites, habitats and species is assessed within this document and appropriate recommendations for mitigation have been made in the form of check surveys, method statements, mitigation strategies, safeguard measures, best practice pollution prevention, long-term habitat compensatory planting and on-Site habitat management in order to reduce potential effects on habitats and species.

1 Introduction

1.1 Project Description

Mott MacDonald has been commissioned by Transport for Wales (TfW), on behalf of Welsh Government, to prepare and submit a planning application, seeking full planning permission for the design and construction of a 1.6km long Major Events Stabling Line (MESL) on land adjacent to the existing Tata Steelworks Service Lines in Llanwern, South Wales. This is Phase 1 of the Llanwern Rail Facilities Programme.

The MESL will be used for stabling of rolling stock for major events in the area, to enable flexibility for future train requirements, and proving of trains prior to use on the rail network. The MESL will be electrified in a future phase of work. This proposed 1.6km length of MESL to the west of Monks' Ditch was formerly known as Option 6a.

The wider Llanwern Rail Facilities Programme will include an extension of the MESL by circa 2.4km east (to achieve a total length of circa 4km), electrification of the MESL, a new Llanwern railway station and passenger line (including Park & Ride and footbridge), and connections to the South Wales Main Line (Relief Lines). The further phases of the project will be the subject of a subsequent planning application.

The key parameters for the Scheme are listed below:

- Whole Site area is 3.1 hectares. This land is contained within the red line boundary shown on the Site Location Plan (Drawing number 367590-MMD-48-XX-DR-C-0001); and
- The Site length is approximately 1.6km long and 19m wide.

1.2 Scope of Works

The General Arrangement drawings (Drawing numbers 367590-MMD-48-XX-DR-C-0002 to 367590-MMD-48-XX-DR-C-0005) demonstrate the project scope which includes the design and construction of the following:

- A single track stabling line (MESL) circa 1.6km long;
- Associated earthworks and landscaping; and
- Drainage and other engineering works.

In order to obtain full planning permission for Phase 1, we have carried out the outline design and technical assessment of the above scope, as well as multiple assessments in terms of ecology, environment, heritage and archaeology.

1.3 Site Location

The proposed rail development Site is located approximately 8 miles east from the centre of Newport, South Wales (Figure 1.1).

The Site is aligned roughly west – east and bordered by the existing South Wales Mainline to the north and the Tata Steelworks to the south. Along the southern boundary of the steelworks site runs the A4810 which links the M4 from junction 23A at Magor with the A48 at Liswerry (a predominantly residential suburb on the south-eastern side of Newport). The site is more widely bordered by the M4 which runs approximately two and a half miles to the north and the Severn

Estuary which lays approximately three miles to the south. The Gwent Levels to the south is a significant area of wetlands.

The existing South Wales Mainline passes north of the proposed Site and provides opportunity for transport links for both passengers and freight.

Figure 1.1: Proposed Location Plan



Source: OS Open Data

The ecological survey work for this baseline sections of this report has been undertaken in respect of the entire woodland (including the site and surrounds), this is shown by the dotted black line as detailed in Appendix A. The survey area was selected prior to the finalisation of Phase 1 of the Llanwern Rail Facilities Programme and is considered to provide important ecology context to the site-specific results as discussed within the impact assessment. Phase 1 of the planning application is indicated by the red line boundary and is hereafter referred to as the 'Site'.

1.4 Scope of the Assessment

The scope of this assessment is to identify, quantify and evaluate potential adverse and beneficial effects of the proposed Scheme on ecological receptors, including habitats, species and designated sites, and to outline the proposed mitigation and enhancement measures.

This Ecological Impact Assessment (EclA) has been prepared in accordance with the Chartered Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018).

The aims of this assessment are to:

- Draw together the ecological baseline information for the survey area;
- Identify potentially important ecological features (including designated sites, habitats and protected or notable species);
- Identify and assess any potential impacts on important ecological features from the construction and operational activities proposed;

- Outline the avoidance measures that have been incorporated into the Scheme;
- Identify any mitigation or compensation measures that are considered necessary to offset potential development impacts (including any licensing requirements for protected species);
- Identify and describe any monitoring requirements to ensure compliance with and effectiveness of mitigation and compensation measures;
- Assess the final Scheme against the relevant legislative and planning policy framework; and
- Identify any opportunities for ecological enhancements, in line with national and local planning policy requirements.

2 Legislation Context and Policy Framework

Developers must ensure that they comply with relevant legislation by fully assessing the potential impacts on protected species and habitats from the Scheme. Where planning permission is required, this assessment must be finalised prior to and included with the submission of the planning application and the proposals should also be in compliance with relevant planning policy. The Planning Authority can then ensure that the necessary protected species and habitats information has been provided to inform an assessment and that proposals are in full accordance with relevant legislation and policy.

The legislation and planning policy context for the Scheme is set out below.

2.1 Legislation

The proposals must comply with the following international, European and national nature conservation legislation relevant to ecological assessment listed below:

- European Community (EC) Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive, 1992) as amended (92/43/EEC);
- EC Directive on the Conservation of Wild Birds (Birds Directive, 1979) as amended (79/409/EEC);
- Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979); and
- Convention on Biological Diversity (1992).

The key piece of national legislation is the Wildlife and Countryside Act 1981 (WCA) (as amended) which consolidates (and amends) existing national legislation in order to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Birds Directive in the UK. It is complemented by The Conservation of Habitats and Species Regulations 2017 which consolidates all the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994.

These regulations transposed the Habitats Directive listed above into National Law. The Regulations provide for the designation and protection of 'European Sites' known as Special Protection Areas (SPA) for Birds and Special Areas of Conservation (SAC) for other habitats and species, as well as the protection of 'European Protected Species'. Under the Regulations, Competent Authorities have a general duty in the exercise of any of their functions to have regard to the EC Habitats Directive. The Habitats Regulations define a "Competent Authority", as a Minister, a government office, a statutory undertaker or public body.

Appendix B outlines species specific legislation.

Under the Environment (Wales) Act 2016 public bodies, including Local Authorities are required 'to seek to maintain and enhance biodiversity in Wales' when carrying out their normal functions. Under Section 7 a list of species and habitats of 'principal importance to the conservation of biodiversity in Wales' was drawn up which acts as an aid to guide public bodies in implementing their duty. The Local Authority must consider the impact of the proposed works on protected habitats and species.

2.2 National Planning Policy

At a national level, Planning Policy Wales outlines the land use planning policy for Wales set out by the Welsh Government. It provides a framework for the effective preparation of Local Planning Authorities' development plans. Chapter 5 of Planning Policy Wales (which relates to conserving and enhancing the natural environment) requires Local Authorities to take measures to:

- Promote the conservation of landscape and biodiversity, in particular the conservation of native wildlife and habitats;
- Ensure that action in Wales contributes to meeting international responsibilities and obligations for the natural environment;
- Ensure that statutorily designated sites are properly protected and managed;
- Safeguard protected species; and
- Promote the functions and benefits of soils, and in particular their function as a carbon store.

This is supplemented by 21 topic based Technical Advice Notes (TAN). In particular TAN 5 - Nature Conservation and Planning provides advice about how the land use planning system should underwrite the protection and enhancement of biodiversity and geological conservation.

2.3 Local Planning Policy

At a local level, the Newport Local Development Plan 2011-2026 (adopted January 2015) details the following strategic policies and general development principals:

- **Strategic Policy SP9** – Conservation of the Natural, Historic and Built Environment: The conservation, enhancement and management of recognised sites within the natural, historic and built environment will be sought in all proposals.
- **Conservation Areas CE7** – Development within or adjacent to conservation areas will be required to:
 - Be designed to preserve or enhance the character or appearance of the conservation area, having regard to the conservation area appraisal where appropriate; and
 - Avoid adverse impact on any significant views, within, towards the outwards from the conservation area.
- **Locally Designated Nature Conservation and Geological Sites CE8** – Proposals affecting locally designated sites will only be permitted where:
 - There would be no overall loss of the nature conservation resource for which the site has been designated; and
 - There would be no significant adverse effect on the geological interest of the site.
- **General Development Principle GP5** – Natural Environmental: Development will be permitted where, as applicable:
 - The proposals are designed and managed to protect and encourage biodiversity and ecological connectivity, including through the incorporation of new features on or off site to further the UK, Welsh and/or Newport Biodiversity Action Plans; and
 - The proposals demonstrate how they avoid, or mitigate and compensate negative impacts to biodiversity, ensuring that there are no significant adverse effects on areas of nature conservation interest including international, European, national, Welsh Section 42 (now superseded by Section 7 of the Environment (Wales) Act 2016) and local protected habitats and species, and protecting features of importance for ecology.

The local development plan is informed by a number of supplementary planning documents including the following of relevance to biodiversity and nature conservation:

- **Newport City Council Supplementary Planning Guidance for Wildlife and Development** (Newport City Council, 2010) provides further advice on development within the catchment relating to wildlife including:
 - The requirement to avoid negative impacts by designing around the wildlife features;
 - To mitigate for any negative impacts on wildlife features; and
 - If it is not possible to avoid or mitigate for certain wildlife features on a site, on or off-site compensation is required.
- **Newport City Council Supplementary Planning Guidance for Trees, Woodland, Hedgerows and Development Sites** (January 2017) provides further advice on development relating to trees, woodland and hedgerows including:
 - The requirement for tree planting or retention of trees; and
 - That development does not result in the unacceptable loss of or harm to trees, woodland or hedgerows that have wildflower or amenity value.

3 Methodology

3.1 Scoping

Consultation has been undertaken with both Natural Resources Wales (NRW) and Newport City Council ecologist in order to agree:

- The scope and proposed methodology of the baseline ecological survey work undertaken;
- The key ecological features being considered under the assessment; and
- The outline mitigation and compensation strategy proposed.

A summary of the consultation undertaken is provided within Table 3.1 below. Relevant email correspondence records referenced within the table are provided within Appendix C:

Table 3.1: Scoping Opinions

Dates	Stakeholder	Scope Agreed / Discussed
01/08/2017 06/09/2017	Newport City Council (NCC)	The scope of ecological surveys and approach of splitting the surveys over two seasons was agreed with the NCC ecologist via email.
06/12/2017	NRW	A meeting was undertaken to introduce NRW to the Scheme, ecological surveys and mitigation proposals. Submission of a dormouse licence was also discussed which would allow greater access into the woodland and a fence line to separate the survey area from the Tata Steel service lines.
18/12/2017	NCC	A meeting was undertaken to discuss the results of the ecology surveys to date and the submission of a dormouse licence.
20/12/2018	NCC	An email was received from NCC ecologist regarding compensatory planting and it was confirmed that NCC would expect a ratio of 1:1.5.
11/01/2018 30/01/2018	NRW	An email was sent to confirm the requirements for great crested newt surveys to the designated Senior NRW Species Officer (SSO) The SSO confirmed via a phone call that survey works are required within 250m of the survey area.
06/03/2018	NCC	An email with mitigation plans was sent to NCC ecologist for comment.
15/02/2018 19/03/2018	NRW	An email was sent to the SSO confirm the survey approach for trees with ground level roost features. Email confirmation was received that agreed the scope of inspection surveys were features lend themselves to this survey method.

Dates	Stakeholder	Scope Agreed / Discussed
16/04/2018 24/04/2018 26/04/2018	NRW	An email was sent to the SSO detailing the presence of the great crested newt survey within 250m of the survey area. The approach to continue footpath clearance (under dormouse licence 78049d:OTH:EPS:2018) under a method statement was detailed as no further works were planned within 500m of the breeding pond. A telephone conversation was held between the SSO and Zoë Costas-Michael which was then confirmed via email. Deployment of static bat detectors 450m away from the survey area at two buildings assessed as suitable for lesser horseshoe bats was also discussed. It was confirmed via email that data would be analysed to determine if this species was using this area of the survey area.
02/05/2018	NCC	A telephone call between the NCC ecologist and Zoë Costas-Michael was undertaken to discuss mitigation proposals. This was confirmed via email.
31/05/2018	NRW	A meeting was undertaken to discuss the ecology surveys to date and mitigation requirements. NRW confirmed that compensatory planting would be required at a 2:1 ratio.
29/08/2018	NCC	An email was sent to NCC ecologist confirming that a Phase 1 Habitat survey would be undertaken on the compensatory land and the species present would be compared to Site of Importance for Nature Conservation criteria.
06/09/2018	NRW	A meeting was undertaken to discuss the changes to the Scheme and provide a more detailed overview of the mitigation proposals.

Source: Mott MacDonald Ltd.

3.2 Zone of Influence

The current guidance on ecological impact assessments (CIEEM, 2018) recommends that all ecological features that occur within a 'Zone of Influence' (Zol) for a proposed development are investigated.

The Zol for this assessment includes:

- Areas directly within the land take for the proposed development and access;
- Areas which will be temporarily affected during construction;
- Areas likely to be impacted by hydrological disruption; and

- Areas where there is a risk of pollution and noise disturbance during construction and/or operation.

The Zol is variable depending on the nature of the construction activities and the ecological receptors affected. For this assessment the following zones have been defined, following guidance set out within the Design Manual for Roads and Bridges (HD44/09)¹:

Table 3.2: Zone of Influence for this Assessment

Ecological Features	Zone of Influence
Designated sites	2.0km
European designated sites for bats	30.0km
Protected species records	2.0km
Protected species evidence	Within or adjacent to survey boundary

3.3 Desktop Study

A desk study was undertaken, as recommended in the CIEEM 'Guidelines for Preliminary Ecological Appraisal' – 2nd edition (2017), to determine the presence of any designated nature conservation sites and protected or notable species within the Zol of the Site.

To ensure the validity of the data, only records collected in the last 10 years and within 2.0km for designated sites and protected species records or 30.0km for sites designated for bats were requested from South East Wales Biodiversity Record Centre (SEWBRc). This data has been further curtailed to the nearest record for each species recorded, raw data is available on request following terms and conditions.

Information to inform the desk study was obtained from the following sources:

- South East Wales Biodiversity Record Centre (SEWBRc);
- Multi Agency Geographical Information for the Countryside (MAGIC) website (<http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx>);
- Natural Resources Wales (NRW) (<http://naturalresources.wales>);
- Welsh Government Online Environmental Information - M4 Corridor around Newport; and
- Joint Nature Conservation Committee (JNCC) (<http://jncc.defra.gov.uk>).

The desk study is presented in the Preliminary Ecological Appraisal Report (PEAR) (Report Reference: 367590-WTD-CAR-2604, Mott MacDonald Ltd, 2018)

3.4 Habitats

An initial field survey was undertaken by an experienced ecologist on the 8 and 9 of June 2017, supplemented by additional visits throughout June 2017 to September 2018. All habitats within the survey area, where accessible, were identified and mapped in compliance with the 'Handbook for Phase 1 Habitat Survey: a technique for environmental audit' (JNCC, 2010). Dominant plant species were noted, as were any protected, uncommon or invasive species listed in Schedule 9 of the WCA. An assessment was also undertaken of the likely presence or absence of protected and notable species within the Zol of the Scheme (i.e. areas within or adjacent to the survey area). This was based on the known distribution of species, habitat suitability and/or direct evidence such as field signs or observations. The methodologies and assessment criteria used were based on current published guidance.

¹ It has been advised by Welsh Government that, since this is a major transportation scheme, it is appropriate to follow these guidelines.

Off-site land proposed for compensatory habitat creation (“compensatory land”) was subject to survey on 13 September 2018 by an experienced ecologist and followed the above survey methodology. This survey aimed to assess the baseline conditions and any constraints, to inform design of an appropriate planting scheme and off-site mitigation.

3.5 Protected species surveys

As set out above, the scope of survey work is outlined below in Table 3.3 and agreed with the Newport City Council Ecologist in September 2017. The survey methodology was also discussed and refined following a meeting with Natural Resources Wales (NRW) in December 2017.

Table 3.3: Scope of protected species surveys currently being undertaken

Survey	Survey Extent	Survey Timings	Survey Guidance
Breeding birds	<ul style="list-style-type: none"> Breeding bird transects were undertaken on a monthly basis between April and June 2018. 	<ul style="list-style-type: none"> April-June 2018 	<ul style="list-style-type: none"> Modified from Common Bird Census (1983) British Trust for Ornithology.
Bats (roosting)	<ul style="list-style-type: none"> All buildings within the survey area and within a 20m buffer of this boundary have been inspected for their potential to support roosting bats; 	<ul style="list-style-type: none"> January 2018 	<ul style="list-style-type: none"> Bat Conservation Trust (2016). Good Practice Guidelines: Bat Surveys for Professional Ecologists; and Design Manual for Roads and Bridges (2001) Volume 10 Section 4 Nature Conservation Advice in Relation to Bats (HA 80/99).
	<ul style="list-style-type: none"> All accessible trees within the survey boundary have been assessed for their potential to support roosting bats; 	<ul style="list-style-type: none"> August 2017- April 2018 	
	<ul style="list-style-type: none"> Buildings and trees assessed as moderate or high bat potential have been subject to further emergence/re-entry surveys and/or tree climbing; 	<ul style="list-style-type: none"> April - September 2018 	
	<ul style="list-style-type: none"> Trees with moderate and high bat potential with ground level potential roost features have been subject to endoscopic surveys in replacement of emergence and re-entry surveys as agreed with Natural Resources Wales (confirmation in an email dated 19 March 2018 (Appendix C)); and 	<ul style="list-style-type: none"> May – September 2018 	
Bats (foraging/commuting)	<ul style="list-style-type: none"> Activity transect surveys have been undertaken on a monthly basis between four 1.0km transect routes with a minimum of 6 listening stops per transect; and 	<ul style="list-style-type: none"> July-October 2017, April-June 2018 	
	<ul style="list-style-type: none"> Static bat detectors were deployed for five consecutive nights on a monthly basis across eight locations (two per transect). 		
Badgers	<ul style="list-style-type: none"> The woodland has been surveyed for presence/likely absence of badgers in all accessible areas of the survey boundary. 	<ul style="list-style-type: none"> November 2017, April 2018 	<ul style="list-style-type: none"> Harris <i>et al.</i>, (1989) Surveying Badgers Design Manual for Roads and Bridges (2001) Volume 10 Section 4 Mitigating Against Effects on Badgers (HA 59/92)

Survey	Survey Extent	Survey Timings	Survey Guidance
Dormice	<ul style="list-style-type: none"> Dormouse presence/absence surveys using 50 boxes and 403 tubes across the survey area have been undertaken from August 2017 to September 2018 (in appropriate months); and A further 100 boxes were installed in February 2018 as part of European Protected Species Licence 78049d:OTH:EPS:2018 	<ul style="list-style-type: none"> August – November 2017 and April to October 2018 	<ul style="list-style-type: none"> Bright <i>et al.</i>, (2006) Dormouse Conservation Handbook Design Manual for Roads and Bridges (2001) Volume 10 Section 4 Nature Conservation Management Advice in Relation to Dormice (HA 97/01)
Otter and Water Vole	<ul style="list-style-type: none"> Monks' Ditch and the reens throughout the survey area have been surveyed for evidence of otter and water vole in October 2017; A second survey has been undertaken in between April and July 2018 which included the survey boundary and the surrounding 250m; and 	<ul style="list-style-type: none"> October 2017 and April, June, July 2018 	<ul style="list-style-type: none"> Strachen & Moorhouse (2006) Water Vole Conservation Handbook Dean, <i>et al.</i>, (2016). The Water Vole Mitigation Handbook Design Manual for Roads and Bridges (2001) Volume 10 Section 4 Nature Conservation Advice in Relation to Otters (HA 81/99)
	<ul style="list-style-type: none"> Camera traps were deployed (as agreed with NRW) across each of the four transects throughout the survey area. 	<ul style="list-style-type: none"> April-August 2018 	<ul style="list-style-type: none"> N/A
Great Crested Newt	<ul style="list-style-type: none"> All accessible reens within the survey area were eDNA surveyed by a licensed and/or accredited ecologist; Habitat Suitability Index (HSI) surveys of all waterbodies in the survey boundary and the surrounding 250m were undertaken; eDNA surveys of all accessible waterbodies with below average or above HSI scores were undertaken by a licensed ecologist; Artificial egg laying strips were deployed in suitable waterbodies and checked four times by a licensed and/or accredited ecologist; and 	<ul style="list-style-type: none"> June 2017 March-April 2018 	<ul style="list-style-type: none"> Langton <i>et al.</i>, (2001) Great Crested Newt Conservation Handbook Design Manual for Roads and Bridges (2001) Volume 10 Section 4 Nature Conservation Advice in Relation to Amphibians (HA98/01)
	<ul style="list-style-type: none"> Presence/absence bottle trapping and torching surveys completed of two waterbodies to the north (within the surrounding 250m - one confirmed GCN pond and one in close proximity). 	<ul style="list-style-type: none"> April-June 2018 	
Reptiles	<ul style="list-style-type: none"> Presence/likely absence surveys were undertaken in areas of suitable habitat across the survey area. 	<ul style="list-style-type: none"> September – October 2017 	<ul style="list-style-type: none"> Froglife (1999) Advice Sheet 9: Reptile Survey Design Manual for Roads and Bridges (2001) Volume 10 Section 4 Nature Conservation Advice in Relation to Reptiles and Roads (HA116/05)
Invertebrates	<ul style="list-style-type: none"> A baseline scoping survey and habitat assessment of the survey area was undertaken by a specialist invertebrate surveyor in April 2018; and 	<ul style="list-style-type: none"> April 2018 	<ul style="list-style-type: none"> Drake <i>et al.</i>, (2007) Surveying terrestrial and freshwater invertebrates for conservation evaluation
	<ul style="list-style-type: none"> Two further survey visits were undertaken in July and August 2018 to establish the invertebrate community in the survey area. 	<ul style="list-style-type: none"> July and August 2018 	

Full methodologies for each species survey are detailed within the species reports as follows:

- Breeding Bird Survey Report (Report Reference: 367590-WTD-CAR-2645, Mott MacDonald Ltd, 2018);
- Bat Survey Report (Report Reference: 367590-WTD-CAR-2616, Mott MacDonald Ltd, 2018);
- Badger Survey Report (Report Reference: 367590-WTD-CAR-2624, Mott MacDonald Ltd, 2018);
- Dormouse Survey Report (Report Reference: 367590-WTD-CAR-2614, Mott MacDonald Ltd, 2018);
- Otter and Water Vole Survey Report ((Report Reference: 367590-WTD-CAR-2625, Mott MacDonald Ltd, 2018);
- Great Crested Newt Survey (Report Reference: 367590-WTD-CAR-2615, Mott MacDonald Ltd, 2018);
- Reptile Survey Report (Report Reference: 367590-WTD-CAR-2617, Mott MacDonald Ltd, 2018); and
- Invertebrate Survey Report (Report Reference: RHE350.001, Rachel Hacking Ecology, 2018).

3.6 Limitations and Constraints

Limitations of the survey work are detailed within individual habitat and species reports as mentioned above. Where survey work was constrained by factors such as access and weather, this has been addressed during the survey windows and/or has been taken into consideration during the interpretation of the results. On this basis, the overall survey work is considered valid and provides appropriate effort to consider the impacts on the habitats and species present.

3.7 Assessment Methodology

The conservation importance was assessed for each of the main ecological features (designated sites, habitats and species) that occur within the Zol. The following are some of the criteria that are used in the assessment of the conservation importance:

- Designation of the site;
- Rarity of the species or habitats;
- Presence of Red Data Book (RDB) or endemic species;
- Presence of diverse assemblages of plants or animals;
- Plant communities typical of natural/semi-natural habitats;
- Habitat diversity; and
- Connectivity and presence of large populations of animals which are uncommon or threatened in a wider context.

The assessment of conservation importance in this report makes reference to the geographical scale of International, National, Regional, County, Local and Zol only (CIEEM, 2018).

Assessment of off-Site 'compensatory site' habitat will be based on the habitat Guidelines for the Selection of Wildlife Sites in South Wales (Gwent Wildlife Trust, 2004).

In assessing potential adverse and beneficial effects of the Scheme, consideration has been given to the following factors in understanding the significance of an effect:

- Extent;

- Magnitude;
- Duration;
- Frequency and timing; and
- Reversibility.

Impacts will also vary according to the ecological feature affected, with the conservation status being influenced by different factors between:

- Habitats – where effects on extent, structure and function of the habitat, as well as distribution and species composition, need to be considered; and
- Species – where effects on abundance and distribution of that species need to be considered.

4 Ecological Baseline

4.1 Statutory Designated Sites

There are five statutory designated sites, one Special Area of Conservation (SAC) and four Sites of Special Scientific Interest (SSSI), that have been identified within 2.0km of the survey area. In addition, six SACs designated for bats have also been identified within 30.0km of the survey area. A map of these designated sites is provided in Appendix D. Details of the designated sites are provided in Table 4.1 below:

Table 4.1: Statutory Designated Sites

Name	Status	Details	Distance and Direction
Designated Sites within 2.0km of the survey area			
Gwent Levels – Redwick and Llandeenny	SSSI	<p>The Gwent Levels constitute the lowlands between Cardiff and Chepstow. They are an example of one of the most extensive areas of reclaimed wet pasture in Great Britain and is the largest area of its kind in Wales.</p> <p>The Gwent Levels reens are rich in plant species and communities, many of which are rare or absent in other Levels systems.</p> <p>The Redwick and Llandeenny area supports rich assemblages of invertebrate species including <i>Chalcis sispes</i> a parasite of the <i>Stratiomys</i> fly larvae, the beetle <i>Scirtes orbicularis</i> and the drone fly <i>Parhelophilus consimilis</i>.</p> <p>The area also contains a number of nationally rare plant species including the rare whorl-leaf watermilfoil (<i>Myriophyllum verticillatum</i>) located in peaty ditches in the northern part of the site and the brackish water crowfoot (<i>Ranunculus baudotii</i>) associated with the ditches bordering the sea wall.</p>	Adjacent - E
Gwent Levels – Nash & Goldcliff	SSSI	<p>The Nash and Goldcliff area forms an important part of the Gwent Levels system and is of particular botanical interest as it is the only area in Wales for the Least Duckweed (<i>Wolffia arrhiza</i>). There is also an interesting community where two species of hornwort; soft hornwort (<i>Ceratophyllum submersum</i>) and rigid hornwort (<i>Ceratophyllum demersum</i>) grow together.</p> <p>The invertebrate interest is also high, as rare and notable species such as ornate brigadier (<i>Odontomyia ornate</i>), common green colonel (<i>Oplodontha viridula</i>) and a water beetle (<i>Hydaticus transversalis</i>) are present.</p>	1.0km S
Gwent Levels - Whitson	SSSI	<p>The Whitson area is of particular importance for its large number of nationally rare and notable invertebrate species. A total of 65 of these rare invertebrates have been recorded in this area including <i>Anthomyza bifasciata</i>, <i>Coptophlebia volucris</i> and <i>Hydrophilus piceus</i>.</p> <p>This area is also important for its botanical interest as it contains the nationally rare hairlike pondweed (<i>Potamogeton trichoides</i>) and is the only location in Gwent for the tussock sedge (<i>Carex elata</i>). Arrowhead (<i>Sagittaria sagittifolia</i>) also grows in abundance in several main reens in this area.</p>	1.1km S
River Usk (lower Usk)/Afon Wysg (Wysg Isaf)	SSSI	<p>The River Usk (Lower Usk) is a rare example of a large mesotrophic lowland river which has not been subject to significant modification by man. Of particular significance to the river's morphology and biology are the extensive deposits of fluvio-glacial and alluvial material in the Usk Valley between Abergavenny and Newport.</p> <p>The river shows a clear downstream succession in plant communities due in part to the rapid transition from mesotrophic</p>	1.8km W

Name	Status	Details	Distance and Direction
		<p>to nutrient rich in its lower reaches and increasing salinity as it nears its confluence with the Severn Estuary.</p> <p>The invertebrate fauna is characteristic of a large lowland river. Of special interest are the craneflies associated with silty river margins in the vicinity of Newbridge on Usk. The fish fauna is of international significance including several rare and scarce species and there is an expanding population of otters. Several scarce higher plant species occurring along the river's tidal reaches are also of special interest.</p> <p>Whilst not a special feature of the site, there is a good range of breeding birds associated with riverine habitats.</p> <p>The SSSI incorporates adjacent areas of riparian habitat which directly support the special interest of the river. These include woodlands dominated by alder (<i>Alnus glutinosa</i>) and willows (<i>Salix</i> spp.), marshy grassland, stands of tall herb, swamp and fen vegetation, salt-marsh and coastal grassland.</p>	
River Usk	SAC	<p>The River Usk comprises a large, linear ecosystem which acts as an important wildlife corridor, an essential migration route and key breeding area for many nationally and internationally important species.</p> <p>Habitats present as a qualifying feature include water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation.</p> <p>Species that are a primary reason for selection of this site include sea lamprey (<i>Petromyzon marinus</i>), brook lamprey (<i>Lampetra planeri</i>), river lamprey (<i>Lampetra fluviatilis</i>), twaite shad (<i>Alosa fallax</i>), atlantic salmon (<i>Salmo salar</i>), bulleard (<i>Cottus gobio</i>) and otter (<i>Lutra lutra</i>).</p>	1.8km W
European Designated sites for bats within 30.0km of the survey area			
Avon Gorge Woodlands	SAC	<p>Avon Gorge Woodlands are designated for the following habitats and species:</p> <ul style="list-style-type: none"> • <i>Tilio-Acerion</i> forests of slopes, screes and ravines; • Semi-natural dry grasslands and scrubland facies on calcareous; • Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>); and • Greater horseshoe bat (<i>Rhinolophus ferrumequinum</i>). 	11.3km NE
North Somerset and Mendip Bat Sites	SAC	<p>North Somerset and Mendip Bat Sites are designated for the following habitats and species:</p> <ul style="list-style-type: none"> • Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (*important orchid sites); • <i>Tilio-Acerion</i> forests of slopes, screes and ravines; • Caves not open to the public; • Lesser horseshoe bat; and • Greater horseshoe bat. 	17.8km NE
Mendip Limestone Grasslands	SAC	<p>Mendip Limestone Grasslands are designated for the following habitats and species:</p> <ul style="list-style-type: none"> • Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (*important orchid sites); • European dry heaths; • Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites); • Caves not open to the public; • Submerged or partially submerged sea caves; • Greater horseshoe bat; and • Early gentian (<i>Gentianella anglica</i>). 	20.6km SE

Name	Status	Details	Distance and Direction
Wye Valley Woodlands and Forest of Dean Bat Sites	SAC	The Wye Valley Woodlands and Forest of Dean Bat Sites are designated for their populations of lesser and greater horseshoe bat.	25.7km NW
Wye Valley Woodlands	SAC	The Wye Valley Woodlands are designated for the following habitats and species: <ul style="list-style-type: none"> • <i>Asperulo-Fagetum</i> beech forests; • <i>Tilio-Acerion</i> forests of slopes, screes and ravines; • <i>Taxus baccata</i> woods of the British Isles; and • Lesser horseshoe bat. 	27.0km SE
Usk Bat Sites	SAC	The Usk Bat Sites are designated for the following habitats and species: <ul style="list-style-type: none"> • European dry heaths; • Degraded raised bogs still capable of natural regeneration; • Blanket bogs (*if active bog); • Calcareous rocky slopes with chasmophytic vegetation; • Caves not open to the public; • <i>Tilio-acerion</i> forests of slopes, screes and ravines; and • Lesser horseshoe bat. 	28.9km S

4.2 Non-Statutory Designated Sites

There are 26 non-statutory designated sites within 2.0km of the survey area, all designated as Sites of Importance for Nature Conservation (SINC). Details of the designated sites are provided in Table 4.2 below:

Table 4.2: Non-statutory Designated Sites

Name	Status	Details	Distance and Direction
Monks' Ditch	SINC	Linear freshwater stream used by otters.	Within the survey boundary
Ringland Way Marsh	SINC	Reedswamp and marsh, with wet grassland areas; supports bird species including Cetti's warbler (<i>Cettia cetti</i>) and reed bunting (<i>Emberiza schoeniclus</i>) (a priority species).	Adjacent – W of the survey boundary
Greenmoor Pool	SINC	Formerly standing water which now supports reedswamp (a priority habitat), which itself supports bird populations including Cetti's warbler.	Adjacent - E of the survey boundary
Dockwell Wood	SINC	Ancient semi-natural woodland.	0.3km N
Hartridge Fields	SINC	Calcareous grassland.	0.3km N
Liswerry Playing Fields and Angling Ponds	SINC	An amenity area with a neutral grassland that borders the edge of the field. Scattered scrub around edges.	0.5km W
Hartridge Wood	SINC	Ancient semi-natural woodland.	0.6km N
Craig-Y-Perthi Field South	SINC	Area of semi-improved calcareous grassland within larger improved grassland field.	0.6km N

Name	Status	Details	Distance and Direction
Craig-Y-Perthi Wood	SINC	Ancient semi-natural woodland with large population of goldilocks buttercup (<i>Ranunculus auricomus</i>) and early purple orchids (<i>Orchis mascula</i>).	0.6km N
Ladyhill Wood	SINC	Ancient semi-natural woodland.	0.7km N
Craig-Y-Perthi Field North	SINC	Area of semi-improved calcareous grasslands within larger improved grassland field.	0.8km N
Ringland Wood	SINC	Ancient semi-natural woodland.	0.9km N
Ridings Wood	SINC	Ancient semi-natural woodland.	1.0km NE
Lawrence Hill	SINC	Mosaic - bracken slopes, semi-natural woodland, scattered scrub over semi-improved and improved grassland.	1.2km NW
The Routes Wood	SINC	Ancient semi-natural woodland.	1.3km N
Spencer Works 3	SINC	Marshy grassland with wet drains.	1.3km S
Coed Rhedyn/Scotch Wood	SINC	Ancient semi-natural woodland.	1.5km N
Wilcricik Fort West	SINC	Unimproved neutral grassland on slopes.	1.5km NE
Solutia Site	SINC	A series of improved and semi-improved grasslands with traditional ditches and ponds. Site supports a range of species including nesting birds such as Cetti's warbler, and invertebrates including hairy dragonfly (<i>Brachyton prantense</i>).	1.5km SW
Pant Yr Eos Wood	SINC	Ancient semi-natural woodland.	1.6km N
Upper cottage pond	SINC	This pond site is surrounded by agriculturally improved fields. Grazed up to the margins and used for drinking by stock, therefore the banks are muddy. The pond does lack diversity, the main interest lies with the abundance of whorl-grass (<i>Catabrosa aquatica</i>). There are mature pedunculate oak trees (<i>Quercus robur</i>) to the south of the pond. This pond is within a candidate Local Development Plan site.	1.6km E
St. Julian's Park	SINC	A large mosaic site of semi-improved and unimproved land neutral grassland areas with bracken, scrub. semi-natural recent broadleaved woodland and improved grassland areas. Supports bulbous foxtail (<i>Alopecurus bulbosus</i>) and possibly Deptford pink (<i>Dianthus armeria</i>).	1.6km NW
Flat Wood	SINC	Remnants of ancient semi-natural woodland.	1.8km N
Underwood Field	SINC	Unimproved neutral and marshy grassland with pale sedge (<i>Carex pallescens</i>).	1.8km N
Stock Wood (East & West)	SINC	Ancient semi-natural woodland.	1.8km N
Elver Pill Reen Grassland & Pond	SINC	Lagoon with mosaic of swamp and marshy and dry semi-improved neutral grassland; supports Cetti's warblers.	1.9km S

4.3 Habitats

4.3.1 Summary of Habitat Descriptions

The survey area is not currently managed for ecological benefit and has remained relatively undisturbed over the past 60 years since the woodland was planted for screening purposes for the adjacent steel works. Due to the undisturbed nature of the area the planted areas are supplemented by self-seeded tree species. The habitat edges and reens are currently managed by Tata Steel to maintain the safe use of the railway line, for water extraction purposes, and to allow access to the reen system. If the Scheme was to not proceed, the survey area would continue to scrub up in many areas but would likely remain the same as described in Table 4.3.

Full details of the habitats within the survey boundary are described within the PEAR (Report Ref: 367590-WTD-CAR-2604, Mott MacDonald Ltd 2018). These habitats are summarised below in Table 4.3 in relation to their dominance.

Table 4.3: Descriptions of Habitats on-Site

Habitats	Description	Locations
Broad-leaved woodland	<p>The vast majority of the survey area is dominated by broadleaved woodland.</p> <p>The canopy is dominated by aspen (<i>Populus tremula</i>), black poplar hybrids (<i>Populus x canadensis</i>) and white poplar (<i>Populus alba</i>). Other tree species present within the woodland include silver birch (<i>Betula pendula</i>), downy birch (<i>Betula pubescens</i>) and Norway maple (<i>Acer platanoides</i>). The east section of the site comprises a number of native species such as occasional oak species (<i>Quercus</i> sp.), hawthorn (<i>Crataegus monogyna</i>), alder (<i>Alnus glutinosa</i>), elder (<i>Sambucus nigra</i>) and ash (<i>Fraxinus excelsior</i>).</p> <p>The understorey is largely composed of willow species (<i>Salix</i> sp.), rose species (<i>Rosa</i> sp.) and bramble (<i>Rubus fruticosus</i>).</p> <p>Ground flora was recorded to include wood sedge (<i>Carex sylvatica</i>), water figwort (<i>Scrophularia auriculata</i>), horsetail (<i>Equisetum arvense</i>), enchanter's-nightshade (<i>Circaea lutetiana</i>), tutsan (<i>Hypericum androsaemum</i>), common skullcap (<i>Scutellaria galericulata</i>), lord's-and-ladies (<i>Arum maculatum</i>), hart's-tongue fern (<i>Asplenium scolopendrium</i>), Himalayan balsam (<i>Impatiens glandulifera</i>), with other species such as ivy (<i>Hedera helix</i>), ground ivy, Virginia creeper (<i>Parthenocissus quinquefolia</i>) and horsetail also present in particular areas.</p> <p>The orchid species, broad-leaved helleborine (<i>Epipactis helleborine</i>) and common spotted (<i>Dactylorhiza fuchsii</i>) were recorded to the far east of the site. Bee orchid (<i>Ophrys apifera</i>) was recorded along the edge of the woodland in more disturbed areas with ballast.</p> <p>Himalayan balsam dominates the ground flora immediately adjacent to Monks' Ditch but is present across the survey area in large patches.</p> <p>From a botanical viewpoint, the woodland habitat within the survey area is therefore considered to be of relatively low value. From a habitat perspective, the woodland forms a long, linear corridor and offers suitable habitat for a range of wildlife species (including protected species, discussed separately below) and is therefore considered to be of local value.</p>	Throughout the survey area
Dense continuous scrub	<p>Dense scrub is present along most of the woodland edge and is dominated by butterfly-bush (<i>Buddleja davidii</i>). Dense scrub in the form of bramble is also present within the woodland in clearings and along the banks of reens.</p> <p>This habitat comprises of common and widespread species and is considered to be of low ecological value.</p>	Along the southern edge of the woodland and largely forms the understorey to the west of Monks' Ditch

Habitats	Description	Locations
Tall ruderal	<p>Tall ruderal vegetation within the survey area comprises rosebay willowherb (<i>Chamerion angustifolium</i>), great willowherb (<i>Epilobium hirsutum</i>), teasel (<i>Dipsacus fullonum</i>), bristly oxtongue (<i>Helminthotheca echioides</i>), creeping thistle (<i>Cirsium arvense</i>), hemp agrimony (<i>Eupatorium cannabinum</i>), creeping buttercup, wild strawberry (<i>Fragaria vesca</i>), spear thistle (<i>Cirsium vulgare</i>), horsetail, tufted vetch (<i>Vicia cracca</i>), curled dock (<i>Rumex crispus</i>), dock species (<i>Rumex</i> sp.), stinging nettle, oxford ragwort (<i>Senecio squalidus</i>) and broad-leaved willowherb (<i>Epilobium montanum</i>).</p> <p>Tall ruderal vegetation was also recorded around Monks' Ditch in association with the banks on both sides. This parcel comprises rosebay willowherb, great willowherb, horsetail and hemp agrimony. Stinging nettle is dominant in this habitat.</p> <p>Tall ruderal vegetation within the survey area was found to comprise common and widespread species and therefore is considered to be of low ecological value.</p>	Edge habitat on ballast, also in small openings to the far west, east an around drain access points and Monks' Ditch
Marginal vegetation	<p>Marginal vegetation comprises common reed (<i>Phragmites australis</i>).</p> <p>Marginal vegetation was frequent on survey area with low species diversity present. It is therefore considered to be of low ecological value.</p>	Present around reens to the east of the survey boundary and at Monks' Ditch
Standing water	<p>The majority of the reens were approximately 2.0m wide with marginal vegetation and/or tall ruderal/scrub mosaics on their banks.</p> <p>The standing water within the survey area is considered to be in poor condition with many of the reens covered by duckweed (<i>Lemna minor</i>). A number of reens were also recorded to have unnatural discolouration. The reens within the survey area are therefore considered to have low ecological value.</p>	Complex reens system is present throughout the survey area
Running water	<p>Monks' Ditch is relatively central and bisects the woodland. It is approximately 4.0-5.0m in width with a steady flow running north to south. Tall ruderal and marginal vegetation habitat borders the edges of Monks' Ditch. It provides a linear commuting route for protected and/or notable species and whilst is subject to fly-tipping, it is considered to be of moderate ecological value.</p>	Monks' Ditch is present approximately 1.6km from the western edge of the survey area
Ephemeral /short perennial	<p>Species recorded in these areas variously included wood sage (<i>Teucrium scorodonia</i>), ploughman's spikenard (<i>Inula conyzae</i>), wild strawberryherb Robert (<i>Geranium robertianum</i>), biting stonecrop (<i>Sedum acre</i>), Canadian fleabane (<i>Conyza canadensis</i>), hairy St John's wort (<i>Hypericum hirsutum</i>), perforate St John's wort, prickly sowthistle (<i>Sonchus asper</i>), ivy, musk mallow (<i>Malva moschata</i>), evening primrose (<i>Oenothera biennis</i>), creeping thistle, selfheal (<i>Prunella vulgaris</i>), Virginia creeper, teasel, common stork's-bill (<i>Erodium cicutarium</i>), viper's-bugloss (<i>Echium vulgare</i>), hemp agrimony, common toadflax (<i>Linaria vulgaris</i>), black medick (<i>Medicago lupulina</i>), oxford ragwort, common ragwort (<i>Senecio jacobaea</i>), forget-me-not species (<i>Myotis</i> sp.), scarlet pimpernel (<i>Anagallis arvensis</i>), scentless mayweed (<i>Tripleurospermum inodorum</i>), oxeye daisy (<i>Leucanthemum vulgare</i>), hedge mustard, weld (<i>Reseda luteola</i>), narrow-leaved everlasting-pea (<i>Lathyrus sylvestris</i>), vervain (<i>Verbena officinalis</i>), water mint (<i>Mentha aquatica</i>), ribbed melilot (<i>Melilotus officinalis</i>) and broadleaved willowherb.</p> <p>Ephemeral/short perennial habitats within the survey area are considered to be of low ecological value and represent common and widespread species.</p>	Ephemeral/short perennial habitat is present along the ballast edge and where reens are situated in open areas
Fence	<p>A small concrete post and wire fence roughly 1.2m in height ran along the woodland from the west to Monks' Ditch. A taller fence roughly 2.0m in height, lined the pumphouse in the east of the survey area. Palisade fencing is also present around the gas station. Heras fencing also surrounds the Balfour Beatty compound.</p>	West of the site; Pumphouse; Balfour Beatty Compound; and Gas station
Earth bank	<p>A small earth bank was location to the east of the survey area which was overgrown with scrub and tall ruderal species. It comprised Made Ground of old ballast with rubble.</p>	East of the survey area
Buildings	<p>A pump house was observed within the woodland towards the east of the survey area. It is a metal clad building with a flat metal roof, surrounded by a 2.0m metal security fence.</p> <p>Four other buildings are within 20.0m of the survey area. These include; Rail control, DB Schenker control, a gas station and a smaller building associated with the gas works.</p> <p>The rail control is a two-storey building composed of brick with a flat roof. DB Schenker</p>	Pump House – east of the survey area within the woodland; Rail Control – south of Tata Steel service lines,

Habitats	Description	Locations
	is a one-storey building composed of brick with a flat roof. A gas station is also present opposite Monks' Ditch within a compound surrounded by palisade fencing; it is a single storey building composed of concrete slabs with a pitched roof. A smaller single-storey building is also situated within the compound and is composed of brick with a flat roof.	central to the survey area; DB Schenker – south of Tata Steel service lines, west of rail control Gas Station – within fencing to the west of the survey area, south of the Tata Steel service tracks; and Associated Gas Building - smaller building within the gas station fencing to the west of the survey area
Bare ground	Patches of bare ground were recorded with pioneer species establishing which include; perforate St John's wort, Himalayan balsam, stinging nettle and greater burdock.	During time of survey – recently cleared areas around reens
Hard standing	Hardstanding was located along the southern edge of the survey area which comprised ballast for Tata's service lines. Hard standing was also present in the form of an access track and compound which has been established since 2015.	South of the woodland To the east of the survey area within cleared section of woodland

Source: Mott MacDonald Ltd (2018)

4.3.2 Priority Habitats

A number of the habitats within the survey area meet the descriptions of habitats listed under Section 7 Habitats of Principal Importance under the Environment (Wales) Act 2016 and the Newport Local Biodiversity Action Plan (LBAP) (Newport Biodiversity Partnership, 2018) and are therefore considered to be of elevated ecological value in the local context. In addition, other habitats are present which although not designated, may offer value to faunal species of interest and are therefore also considered to be of ecological interest. These are discussed in Table 4.4 below.

Table 4.4: Priority Habitats Present on-Site

Habitat Present within the Survey Area	Determination
Broad-leaved plantation woodland (Wet woodland)	<p>The woodland falls within the classification of wet woodland under Section 7 Habitats of Principal Importance under the Environment (Wales) Act 2016 and the Newport Local Biodiversity Action Plan (LBAP) (Newport Biodiversity Partnership, 2018). However, this area of woodland, like the rest of the survey area, is considered to be in relatively poor condition both in terms of structure and species diversity owing to a lack of management and encroachment by non-native and invasive species. The depth of the soil cover within the survey area is also not ideal to support mature and semi-mature tree species.</p> <p>From a botanical viewpoint, the woodland habitat within the survey area is therefore considered to be of relatively low value. From a habitat perspective, the woodland forms a long, linear corridor and offers suitable habitat for a range of wildlife species (including protected species, discussed separately below) and is therefore considered to be of local value.</p>
Tall ruderal and ephemeral/short perennial (Open Mosaic Habitat)	These habitat mosaics within the survey area meet the criteria of Open Mosaic Habitat (OMH) which are detailed in the PEAR (Mott MacDonald, 2018). This habitat falls within the classification of Open Mosaic Habitat (OMH) under Section 7 Habitats of Principal Importance under the Environment (Wales) Act 2016.
Marginal Vegetation (Reedbed)	These marginal vegetation habitats recorded within the survey area fall within the classification of reedbed under Section 7 Habitats of Principal Importance under the Environment (Wales) Act 2016 and the Newport

Habitat Present within the Survey Area	Determination
	Local Biodiversity Action Plan (LBAP) (Newport Biodiversity Partnership, 2018). However, the areas of reed were recorded to be fairly limited in extent, represented by linear stretches of reed within drains and reens.

Source: Mott MacDonald Ltd (2018)

As discussed in Table 4.3, the reens within the survey area are considered to be in poor condition with duckweed cover and discolouration present. However, Monks' Ditch is considered to be of moderate ecological value due to its potential use as a linear corridor for a number of protected and/or notable species.

The remaining habitats are considered of negligible or low ecological value at a local level and are therefore not considered further except where these may be of value for faunal species and are therefore discussed separately below.

4.4 Species

A summary of the species survey findings are detailed in Table 4.5 below.

Table 4.5: Summary of the Species Survey Results within the Survey Area

Species	Survey Findings
Breeding Birds	<p>A total of 42 species were recorded as breeding within the survey area, largely associated with the woodland and reed habitats. This included two Schedule one species, six priority species, six species listed on the Newport Local Biodiversity Action Plan (LBAP), six red list species and ten amber list species (listed on Birds of Conservation Concern Wales 3). These species are all typical of the woodland and wetland habitats present within and surrounding the survey area and are relatively common in the local area. The assemblage as a whole is considered of value at a local level.</p> <p>Of particular note was the Schedule 1 species Cetti's warbler (<i>Cettia cetti</i>) which has been recorded as possibly breeding within the survey area with a likely territory held outside the survey area indicating that this species is probably breeding here. The territories held likely incorporate the adjacent SINC habitats (Ringland Way Marsh SINC) as this is typical habitat of breeding Cetti's warbler.</p> <p>Other notable species recorded include the Schedule 1 species kingfisher (<i>Alcedo atthis</i>), which has been recorded as probably breeding within the survey area with a pair recorded at Monks' Ditch. The banks of the watercourse provide suitable nesting habitats for this species and as such their presence within the survey area cannot be ruled out.</p>
Bats (Roosting)	<p>Following bat tree assessments, tree climbing, endoscopy and emergence/re-entry bat surveys, a total of 22 bat roosts have been identified within trees across the survey area in the form of transitional roosts of the following species:</p> <ul style="list-style-type: none"> ● Common pipistrelle (<i>Pipistrellus pipistrellus</i>); ● Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>); ● Pipistrelle sp. (<i>Pipistrellus</i>); ● Noctule (<i>Nyctalus noctula</i>); ● Serotine (<i>Eptesicus serotinus</i>); and ● Unknown roosts (likely to be minor roosts of low importance). <p>A further 15 trees were assessed as having high potential to support bat roosts and 29 trees were assessed as having moderate potential to support bat roosts. These were subject to further surveys (tree climbing, endoscopy and emergence/re-entry surveys) and no roosts were recorded. A total of 201 trees were assessed as having low potential to support bat roosts and therefore were not subject to further surveys.</p>

Species	Survey Findings
Bats (Foraging)	<p>A total of five buildings within the survey area and within a 20m buffer of this were assessed for their potential to support bat roosts. A further two buildings fell just outside of 20m and therefore were included in this assessment. Of these buildings, two were assessed as having moderate potential and one building was assessed as having high potential to support roosting bats. These buildings were subject to further dusk emergence/dawn re-entry surveys which confirmed building (Building B7) as supporting a transitional pipistrelle sp. roost. This building is located approximately 3.3km away from the construction zone and will therefore not be impacted by the works.</p> <p>The survey area is considered to be of county value for roosting bats following the assessment methodology in Wray <i>et al.</i>, (2010).</p> <p>Bat static detector deployment and manual transect bat surveys identified bat activity throughout the survey area at a moderate to high levels. Bat species recorded during static and manual surveys included:</p> <ul style="list-style-type: none"> ● Pipistrelle species (<i>Pipistrellus</i> sp.); ● Noctule; ● Long-eared species (<i>Plecotus</i> sp.); ● <i>Myotis</i> species; ● <i>Nyctalus</i> species; ● Serotine; ● Big bats; and ● Lesser horseshoe (<i>Rhinolophus hipposideros</i>). <p>Of the foraging and commuting activity recorded, this was dominated by common and soprano pipistrelle bats with intermittent high levels of activity from Noctule (and unidentified <i>Nyctalus</i> sp) bats. Pipistrelle species were observed foraging along the woodland edges and over reens as well as commuting along the woodland edges. <i>Nyctalus</i> sp. were largely observed foraging around the tower lights and commuting over the woodland and land to the south. Low levels of <i>Myotis</i> bat activity was also recorded and <i>Myotis</i> sp. bats were observed foraging over the reens (this species is considered likely to be Daubenton's bats as they favour riverine habitats (Collins, 2016). Other activity recorded included occasional long-eared bat and serotine, and a small number of lesser horseshoe bats were recorded (four of 70,312 calls) within the woodland on static detectors.</p> <p>With reference to Bat Conservation Trust distribution maps, local records and guidance in Wray <i>et al.</i>, (2010) the survey area has been assessed as county level importance for foraging and commuting bats.</p>
Badgers	<p>Badger surveys confirmed presence of a disused outlier sett within the survey area. A second disused, collapsed outlier sett was also observed, along with signs of foraging and badger dung. Additional badger evidence was observed during spring and summer 2018 which included two latrines, a disused outlier sett and an active subsidiary sett. Camera trapping surveys also recorded badgers in six locations across the survey area.</p> <p>No evidence of any main or annex setts was recorded, indicating that the woodland is unlikely to be of high value to badgers at a local level. However, based on the evidence recorded, badgers appear to be using the survey area to forage and also for sett creation. Therefore, it is considered to be of site value for badgers. Badger setts cannot be ruled out within inaccessible locations of dense scrub.</p>
Dormice	<p>No dormice have been found during a total of ten surveys (August – November 2017, April -September 2018). Four dormouse nests have been confirmed within the survey area by a dormouse licensed ecologist (in October 2017, May 2018 and September 2018). In addition, two further suspected dormouse nests were also recorded during September and October 2017 surveys (based on the evidence recorded and location, these have been treated as dormice for the purposes of this assessment).</p> <p>Based on the results to date, dormice are considered likely to be present in higher numbers east of Monks' Ditch, but have been recorded in both the east and west of the survey area. Therefore, it is considered that dormice are present throughout the woodland.</p> <p>The survey area is therefore considered to be of local - borough value for dormice.</p>
Otter	<p>Otter surveys within the survey area and a 250m buffer of this have identified no holts, layups or any other evidence of use by otter. The vast majority of the survey area is therefore considered of negligible value to this species.</p> <p>However, Monks' Ditch is a known SINC for otters and therefore precautionarily it is considered that the potential for occasional use of the section of Monks' Ditch for foraging and commuting cannot be ruled out.</p>

Species	Survey Findings
	Due to no confirmed evidence within the survey boundary and the presence of Monks' Ditch, otters are considered to be of local value for otters.
Water Vole	<p>Water vole surveys within the survey area and the surrounding 250m identified ten potential water vole burrows and water vole footprints (from Monks' Ditch) and two potential feeding stations during 2017 and 2018 surveys. Two potential feeding stations and five potential burrows were within the survey area whilst the remaining five potential burrows were within the surrounding 250m. Best practice guidance advises that burrows, footprints and feeding stations cannot be reliably used as evidence on their own according (Stranchan <i>et al.</i>, 2011) and no latrines or droppings were recorded which could confirm presence of this species.</p> <p>The habitats within the survey area are considered suitable to support this species and water voles are known to be present in the local area from background records. On this basis and given the multiple potential signs recorded, water voles have precautionarily been assessed as likely to be using the survey area in some capacity. The survey area is therefore considered to be of local value for water voles.</p>
Great Crested Newts	<p>A total of 56 waterbodies within the survey boundary and the surrounding 250m were assessed using Habitat Suitability Index (HSI) surveys, following which 35 waterbodies within the survey area and a 250m buffer of this were assessed as being of below average or greater suitability to support great crested newt. These 35 waterbodies and an additional 2 waterbodies that were assessed as having poor suitability to support great crested newt were scoped in for further surveys (one as access was gained to the waterbody late in the great crested newt survey season so eDNA surveys were prioritised; and the other due to proximity to a confirmed great crested newt waterbody as detailed below).</p> <p>A single great crested newt egg was found on an egg laying strip in waterbody within Llanwern Golf Club (Waterbody 38), approximately 125m to the north of the Network Rail South Wales Mainline. Further surveys recorded a peak count of one male great crested newt. This waterbody has therefore been assessed having a low population of great crested newt. The waterbody is surrounded by suitable terrestrial habitat in closer proximity than the survey area, including woodland, such that the likelihood of newts using the survey area is considered low. Nonetheless, there are no dispersal barriers between the waterbody and the survey area, whilst the site provides suitable terrestrial opportunities for this species, such that presence cannot be completely ruled out. The survey area is therefore considered to be of local value for great crested newts.</p>
Reptiles	<p>The survey work has identified a low population of grass snake (peak count of two) and a good population of slow-worms (peak count of 10) (assessed in line with Froglife, 1999) within the survey area. It is considered that both grass snake and slow-worm populations within the survey area are breeding, as sub-adults and juveniles were recorded.</p> <p>According to the Guidelines for the Selection of Wildlife Sites in South Wales (Gwent Wildlife Trust, 2004), any site supporting a good population of any reptile species should be considered for selection of a wildlife site (i.e. SINC). This guidance also states that recording several individuals of a species on half or more of the survey occasional should be taken to indicate the presence of a 'good' population. As life stage (e.g. adult or juvenile) is not accounted for in this guidance, following a precautionary approach, the population estimate for grass snake may be elevated to 'good' whilst the survey area is considered to be of at least local – borough value for reptiles.</p>
Invertebrates	<p>The woodland, reens, marginal habitats and open mosaic habitats are all of suitability for invertebrates whilst the open mosaic habitats in particular are known to often support diverse and valuable invertebrate assemblages.</p> <p>Specialist surveys have identified [with identification on-going] nationally scarce invertebrates including <i>Anobium inexpectatum</i>, <i>Meligethes fulvipes</i>, <i>Eupeodes nielsenii</i>, <i>Chorisops nagatomii</i> and <i>Hippodamia variegata</i>. These species use ivy stems, plants from the Brassicaceae and the Umbelliferae family and ex-industrial habitats respectively. The populations of these specific invertebrates, given their status, is considered to be of regional importance.</p> <p>The overall assemblage mostly common and widespread; therefore the survey area is (with the exception of the individuals above) considered to be of at least local value for invertebrates.</p>
Invasive Plant Species	Himalayan balsam has been recorded throughout the survey area whilst Virginia creeper has been recorded largely to the west of survey area, creating dense mats on trees and along the ballast.

Source: Mott MacDonald Ltd

4.5 Identification of Important Ecological Features

On the basis of the above baseline ecological information for the survey area, the following have been identified as Important Ecological Features within the context of the survey area and have therefore been scoped into the impact assessment:

- Ecological Designations – All of the above listed designations;
- Habitats – The priority habitats listed in Table 4.4 (wet woodland, open mosaic habitat, and reedbed);
- Protected and Notable Species – All of the species listed within Table 4.5 have been scoped in given their legislative protection and/or conservation value; and
- Invasive plant species – Himalayan balsam and Virginia Creeper as detailed in Table 4.5.

4.6 Off-Site Compensatory Land

A Technical Note and a Phase 1 Habitat Map is provided in Appendix E which detail the results of this survey.

In summary, the off-site habitats proposed for compensatory planting comprise neutral semi-improved grassland and marshy grassland habitats, with occasional scrub and scattered trees. Most of these habitats were species poor save for a small area in the along the reservoir fence line. These habitats have been assessed against the criteria for local SINC designation which has concluded that the habitats do not meet criteria for marshy or neutral grassland SINC.

5 Impact Assessment and Proposed Mitigation

The following section sets out (i) the key avoidance measures which have been embedded into the Scheme in order to reduce potential impacts; (ii) the anticipated impacts of the Scheme on the identified Important Ecological Features of the Site; and (iii) the proposed mitigation and compensation measures considered necessary and proportionate to reduce or off-set impacts.

The overall approach to mitigation has been agreed in principle with NRW and the county ecologist through dedicated consultation. Further information on the mitigation measures proposed, including rationale and consideration of this phase of works against future masterplan, are detailed in the following reports:

- Llanwern Dormice Mitigation and Monitoring Strategy (367590-WTD-CAR-2649); and
- Llanwern On-Site and Off-Site Mitigation and Monitoring Plan (Report Ref: 367590-WTD-CAR-2650, Mott MacDonald Ltd 2018).

5.1 Avoidance Measures

In line with policy and best practice, the Scheme has been designed as part of an iterative process taking into consideration ecological constraints, following which the following avoidance measures have been embedded into the Scheme in order to avoid or minimise impacts:

- Siting of the Phase 1 area within the south of the existing woodland and edge habitats to maximise the width of the area retained and minimise tree loss; and
- Siting of the Phase 1 area to avoid large losses of reens and incorporating diversions where necessary.

The Management Plan report sets out a background to the Scheme design and consideration of alternatives.

5.2 Assessment of Impacts and Proposed Mitigation/Compensation

5.2.1 Designated Sites

The Scheme may have impacts on designated sites as indicated in Table 5.1 below:

Table 5.1: Assessment of Impacts of the Scheme on Designated Sites

Feature	Location and Value	Level of Protection	Assessment	Mitigation
Gwent Levels – Redwick and Llandeenny (SSSI)	Adjacent E National	Wildlife and Countryside Act 1981 (as amended).	<p>The reens on-Site are hydrologically connected to the reen system within the Gwent Levels.</p> <p>The Gwent Levels could be affected by indirect construction effects in the form of increased sedimentation, pollution, dust and other run-off during construction works.</p> <p>The high-level water quality assessment indicates that the Scheme presents a very low risk to water quality (Report Reference: 367590-WTD-CAR-2657, Mott MacDonald Ltd, 2018).</p> <p>No long-term impacts are anticipated.</p>	<p>Pollution Prevention and hydrological measures should be implemented through a Construction Environmental Management Plan (CEMP) to ensure this feature is safeguarded during the works.</p> <p>SSSI assent for the works will be sought from NRW.</p>
River Usk (SAC)	1.8km W International	EC Habitats Directive.	<p>The reens on-Site are hydrologically connected to the River Usk.</p> <p>The river could be affected by indirect construction effects in the form of increased sedimentation, pollution, dust and other run-off during construction works.</p> <p>No long-term impacts are anticipated.</p> <p>A Habitats Regulation Assessment (HRA) of the Scheme has been completed separately (Report Reference: 367590-WTD-CAR-2630, Mott MacDonald Ltd, 2018) which has concluded no likely significant effect.</p>	<p>Pollution Prevention and hydrological measures should be implemented through a Construction Environmental Management Plan (CEMP) to ensure this feature is safeguarded during the works.</p>
Other European Designations (designated for bats)	Within 30.0km International		<p>A Habitats Regulation Assessment (HRA) of the Scheme has been completed separately (Report Reference:</p>	N/A

Feature	Location and Value	Level of Protection	Assessment	Mitigation
			367590-WTD-CAR-2630, Mott MacDonald Ltd, 2018) which has concluded no likely significant effects on bat SACs within 30.0km. In summary, this is owing to extremely low levels of Lesser Horseshoe bat activity (single passes) being recorded on site whilst no Greater Horseshoe calls were recorded. The Site is therefore unlikely to be of value to populations of these species linked to the SACs.	
Monks' Ditch (SINC)	Approximately 17m from the Site extent Borough	SINC's are protected at the Local Authority level within the local and structure plans under the Town and Country Planning Act.	Given the proximity of these designations, these designations could be affected by hydrological changes or indirect effects such as dust deposition. Consideration of effects on Cetti's Warbler within the Ringland Way Marsh SINC is included in the breeding bird section below.	Pollution Prevention and hydrological measures should be implemented through a Construction Environmental Management Plan (CEMP) to ensure these features are safeguarded during the works.
Ringland Way Marsh (SINC)	Approximately 190m from the Site extent Borough			
Greenmoor Pool (SINC)	Approximately 3.0km from the Site extent Borough			

5.2.2 Habitats

The Scheme may have impacts on protected and/or notable habitats as indicated in Table 5.2 below:

Table 5.2: Assessment of Impacts of the Scheme on Habitats

Feature	Location	Level of Protection	Assessment	Mitigation
Broad-leaved plantation woodland (Wet woodland)	The section of wet woodland to the west.	Wet woodlands are listed under Section 7 habitats of principal importance under the Environment (Wales) Act 2016. Wet woodlands are listed on the Newport Local Biodiversity Action Plan.	The proposals will require woodland loss (no distinction between temporary and permanent loss has been made given the habitat type) and therefore an impact on habitat directly, as well as potential for indirect effects from new edge creation (exposing trees to the elements) and construction disturbance (dust, hydrological effects, etc).	Habitat will require off-Site mitigation at a ratio of 2:1 as agreed with Natural Resources Wales (NRW). On-Site habitat management will be implemented within the Llanwern On-Site and Off-Site Mitigation and Monitoring Plan (Report Ref: 367590-WTD-CAR-2650, Mott MacDonald Ltd 2018).

			Woodland loss is also significant as removing habitat for protected species using the woodland.	
Ephemeral/ short perennial and tall ruderal (Open Mosaic Habitat)	Along the edge of the woodland and within patches in the woodland.	These habitats meet the OMH criterion. OMH is listed under Section 7 habitats of principal importance under the Environment (Wales) Act 2016 and is principally of value for invertebrates.	The proposals will temporarily result in some loss of OMH. However, this is an early successional habitat maintained by disturbance and it is anticipated that more OMH will be created following the installation of the new stabling line. Consideration of invertebrates is provided separately below.	See invertebrate section below.
Marginal vegetation (Reedbed)	Within reens on-Site.	Reedbeds habitats are listed under Section 7 habitats of principal importance under the Environment (Wales) Act 2016. Reedbeds are listed on the Newport Local Biodiversity Action Plan.	These habitats are considered unlikely to be of high ecological value but could nonetheless be affected directly through any works to the reens as well as indirectly by hydrological changes and dust deposition. This would result in a temporary loss of this habitat and effects on species using these areas.	Pollution Prevention and hydrological measures should be implemented through a Construction Environmental Management Plan (CEMP) to ensure these features are safeguarded during the works. Reeds will readily return following the works and the diversions of the reens. On-Site habitat management will be implemented within Llanwern On-Site and Off-Site Mitigation and Monitoring Plan (Report Ref: 367590-WTD-CAR-2650, Mott MacDonald Ltd 2018).

5.2.3 Protected and Notable Species

The Scheme may have impacts on protected and/or notable species as indicated in the Table 5.3 below:

Table 5.3: Assessment of Impacts of the Scheme on Species

Feature	Location and Value	Level of Protection	Assessment	Mitigation
Breeding birds	Scrub, woodland, tall ruderal and reens	All breeding birds are fully protected under the Conservation of Habitats and Species Regulations 2017 and the WCA.	The Site contains habitat to support this species group, whilst Schedule 1 species such as kingfisher and Cetti's warbler have been recorded survey area as probably and possibly breeding respectively. Works could result in loss of nesting habitat, direct effects on nesting birds and overall reduction in habitat availability for common and notable bird species. It is considered that Cetti's warbler are likely to be breeding within the adjacent SINC (Ringland Way Marsh SINC) whilst the banks of	Any vegetation clearance should be undertaken outside of the nesting bird season. This is widely considered to be from March to August inclusive but can vary depending on the species/or seasonal constraints. Where this is not possible, pre-clearance checks must be undertaken by an experienced ecologist to identify if any birds are nesting within or close to the vegetation due to be removed. If a bird's nest is found, it must be left <i>in-situ</i> and protected from the works. No works can be undertaken in that area until the young birds have

Feature	Location and Value	Level of Protection	Assessment	Mitigation
			<p>Monks' Ditch provide suitable habitat from nesting kingfisher.</p> <p>The vegetation clearance for the Scheme and construction works may results in disturbance to Schedule 1 bird species.</p> <p>A location plan of Cetti's warbler and kingfisher records from the breeding birds survey in relation to the Site is provided in Appendix F. No Schedule 1 bird species have been recorded within the site boundary (Phase 1 of the Llanwern Rail Facilities Scheme).</p>	<p>fledged from the nest site, which may take up to 6 weeks depending on the species.</p> <p>Due to the presence of Schedule 1 birds species within the survey area, a method statement must be adhered to, to prevent disturbance to these species during the breeding period. This will include a pre-works survey by an experienced ornithologist of Monks' Ditch prior to any works commencing on-Site to determine the activity of kingfisher.</p> <p>The method statement for precautionary method of works to protect breeding birds during construction works is provided in Appendix G.</p> <p>In the long-term, habitat for these species will be maintained within the survey area in retained woodland whilst compensatory woodland and scrub planting off-site will provide replacement/alternative opportunities. Habitat creation and management proposals are included within the Llanwern On-Site and Off-Site Mitigation and Monitoring Plan (Report Ref: 367590-WTD-CAR-2650, Mott MacDonald Ltd 2018).</p>
Bats (roosting)	Woodland, wetland (reens), trees and buildings	<p>Bat species and their roosts are fully protected under the Conservation of Habitats and Species Regulations 2017 and the WCA.</p> <p>Various bat species are also listed under Section 7 Species of Principal Importance under the Environment (Wales) Act 2016.</p> <p>Nine species are listed on the Newport Local Biodiversity Action Plan.</p>	<p>A total of two of the bat roosts identified lie within the Site (Phase 1 of the Llanwern Rail Facilities Scheme) and a further roost lies within a 20m buffer of this. These are as follows:</p> <ul style="list-style-type: none"> - Two serotine transitional roosts (trees); and - One unknown minor roost (trees) of low importance. <p>The construction works will therefore result in the destruction of two known bat roosts and may result in disturbance to roosting bats (if present) within an adjacent tree (assessed within 20m of the construction zone), both of which would cause an environmental offence under current legislation. The drawing provided in Appendix H highlights the bat tree locations within the construction enclave.</p> <p>Furthermore, there are 20 of trees with low potential to support bat roosts within the construction zone (or the 20m buffer) which have not been surveyed but for which precautionary mitigation is required during construction.</p>	<p>Any vegetation clearance works would require a licence from NRW to allow the destruction of roosts and/or disturbance to roosting bats within the woodland.</p> <p>This would require mitigation to be implemented, which would be subject to approval by NRW but is likely to include:</p> <ul style="list-style-type: none"> ● A site-specific tool-box talk should be given to all staff prior to works commencing; ● Replacement roosting features to be installed on-Site (replacement of bat roosts on a 3:1 basis with box installation on retained trees); ● Retention of roosting features where possible (limbs or trunks retained and strapped to nearby trees); ● Ecological supervision of vegetation clearance (including a pre-works check of the tree, section felling and lowering of limbs for inspection by the ecologist); and ● Best practice measures to minimise disturbance such as directional lighting.

Feature	Location and Value	Level of Protection	Assessment	Mitigation
Bats (foraging)			<p>Construction activities are unlikely to affect foraging and commuting bats given the existing high levels of disturbance and lighting within the Site.</p> <p>In the long-term, the proposals will result in a reduction in woodland habitat but will not affect the amount of edge habitat present or water features such as area of reens, whilst connectivity at a landscape scale will be maintained by the retained woodland. Diverting of reens may result in localised reductions in invertebrate abundance but this only affects small areas of the Site and would be temporary.</p> <p>No change in lighting from the Scheme is anticipated. Existing high levels of lighting and existing disturbance is present within the Site (with tower lights in particular appearing to attract insect and therefore providing a key foraging resource).</p> <p>On this basis, foraging bats are therefore unlikely to be significantly affected.</p>	<p>In addition, removal of any low bat potential trees should be undertaken following a soft-felling approach (whereby limbs are carefully removed, lowered to the ground and left overnight).</p> <p>In the long-term, loss in woodland habitat should be compensated for by management of the retained woodland to ensure that this continues to offer roosting, foraging and commuting opportunities for bats.</p> <p>The Scheme does not include any lighting for this phase, however, directional lighting should be used during the construction phase as mentioned above.</p>
Dormice	Within the woodland and scrub habitat.	<p>Dormice are fully protected under the Conservation of Habitats and Species Regulations 2017 and the WCA.</p> <p>Dormice are listed under Section 7 Species of Principal Importance under the Environment (Wales) Act 2016.</p> <p>They are listed on the Newport Local Biodiversity Action Plan.</p>	<p>The Site contains suitable habitat to support this species and dormouse nests have been confirmed within the survey boundary (as being present throughout the woodland).</p> <p>Vegetation clearance within the Site may impact on dormice by causing disturbance, displacement, killing or injury in the absence of mitigation, as well as damage or destruction of a breeding site or resting place (nests).</p> <p>In the long-term, the Scheme will result in a reduction of suitable nesting and foraging habitat for dormice.</p> <p>No fragmentation or habitat severance impacts are anticipated as the Scheme will retain a linear corridor of woodland. A plan identifying confirmed dormouse nests in relation to the site is provided in Appendix I.</p>	<p>Any vegetation clearance works would require a licence from NRW to allow the removal of dormouse habitat and the potential to disturb this species.</p> <p>A Dormouse Mitigation Plan has been prepared (Report Ref: 367590-WTD-CAR-2649, Mott MacDonald Ltd 2018) which includes:</p> <ul style="list-style-type: none"> • A site-specific tool-box talk should be given to all staff prior to works commencing; • Ecological supervision of vegetation clearance (including a pre-works check); • Sensitive timing of ecological clearance (two-staged vegetation clearance methodology down to approximately 300mm during the winter period and removal of vegetation to ground level in April (possibly May depending on weather conditions)); • Creation of new dormouse habitat off-site (including strengthening of existing connectivity); • Management of the retained woodland on-Site to increase the carrying capacity; and • Monitoring of the dormouse population for a period of 10 years.
Otter	Along Monks'	Otters are fully protected under the Conservation of		

Feature	Location and Value	Level of Protection	Assessment	Mitigation
	Ditch, along the reens and within the woodland	Habitats and Species Regulations 2017 and the WCA. Otters are listed under Section 7 Species of Principal Importance under the Environment (Wales) Act 2016. They are listed on the Newport Local Biodiversity Action Plan.	The survey area contains habitat known to support otters (Monks' Ditch). However, no evidence of otters has been recorded during surveys. The survey area also contains suitable habitat for water vole and possible evidence has been found in the form of footprints, burrows and feeding stations. No other signs which could confirm presence of this species, such as latrines or sightings of water vole, were recorded during the survey work, but given the evidence and suitability of habitats, this species is precautionarily treated as likely present on-Site.	An update check is recommended 12 weeks prior to the commencement of works on-Site. As potential evidence of water vole has been recorded within the survey boundary and the surrounding 250m and Monks' Ditch provides suitable foraging and commuting habitat for otters, a method statement following a precautionary working approach is recommended which will include: <ul style="list-style-type: none"> • A site-specific tool-box talk should be given to all staff prior to works commencing; • Ecological supervision of works in and around suitable reens or Monks' Ditch; • Use of sensitive lighting; • Clearance of vegetation using hand tools only in certain areas; and • General best practice within the construction zone.
Water vole	Within the reens and their bank side vegetation	Water vole are fully protected under the Conservation of Habitats and Species Regulations 2017 and the WCA. Water vole are listed under Section 7 Species of Principal Importance under the Environment (Wales) Act 2016. They are listed on the Newport Local Biodiversity Action Plan.	If using the watercourse and/or adjacent reens, otter and water vole could be indirectly affected during construction through increased lighting, noise, siltation and pollution. These species may also be at risk should excavations be left uncovered. Given the low level of evidence recorded and the retention of Monks' Ditch, long-term impacts are not anticipated.	In the unlikely event that an active water vole burrow is recorded during the pre-works walkover within the area to be affected by the works, an ecologist should be contacted to advise on suitable avoidance measures or NRW should be consulted and mitigation will be agreed prior to works commencing on-Site. In the unlikely event an active otter holt or couches are identified within the working area, an ecologist should be contacted to advise on avoidance measures or NRW should be consulted to agree whether a licence would be required for disturbance. The method statement for precautionary method of works to protect otter and water vole during construction works is provided in Appendix J.
Badger	Woodland	Fully protected under the Protection of Badgers Act 1992.	The woodland provides suitable foraging and sett creation habitat for badger. Three disused outlier setts, two latrines and an active subsidiary sett along with badger foraging evidence has been recorded during the surveys. There is potential for the badgers to be affected by the Scheme if works fall within 20m of a badger sett. There may also be a risk should excavations be left uncovered. The badger active sett recorded on-Site is	Badgers can leave existing setts and establish new setts very quickly. Therefore, the following recommendations should be applied to prevent any impacts on badger: <ul style="list-style-type: none"> • An update check is recommended 12 weeks prior to the commencement of works on-Site; • The walkover will establish if there is evidence on-Site that the setts recorded are currently active or

Feature	Location and Value	Level of Protection	Assessment	Mitigation
			approximately 3.0km away from the Site and will not be impacted by the works.	<p>inactive as well as to ascertain if any new setts have been created which would affect the proposed works;</p> <ul style="list-style-type: none"> • If evidence of an active badger sett, which is considered to be affected by any works (such as excavation or vegetation clearance within 20m or pile driving within 100m), is recorded during the pre-works walkover, then Natural Resources Wales (NRW) should be contacted to see if a licence will be required; and • General best practice should be followed within the construction zone. <p>The method statement for precautionary method of works to protect badger during construction works is provided in Appendix K.</p>
Great Crested Newts	Within the reens.	<p>Great crested newts are fully protected under the Conservation of Habitats and Species Regulations 2017 and the WCA.</p> <p>Great crested newts are listed under Section 7 Species of Principal Importance under the Environment (Wales) Act 2016.</p>	<p>The survey area contains suitable habitat to support this species group in the form of woodland, reens and tall ruderal vegetation. A single waterbody, approximately 125m away from the northern edge of the woodland, was found to support a low population of great crested newts.</p> <p>It is considered unlikely that this species would be present on-Site, given the distance to the pond, low numbers recorded and presence of suitable habitat in closer proximity to the pond. Nonetheless, great crested newts may be impacted during construction in the unlikely event they are using the woodland or associated habitats as terrestrial habitat (killing, injury or disturbance of individuals).</p> <p>The anticipated woodland loss and habitats affected (including edge habitats and ballast) within 250m of this pond is approximately 0.72ha. Following Natural England guidance (rapid risk assessment tool in the licence method statement), the loss of this suitable habitat is considered likely to trigger need for a licence. A plan identifying the location of the confirmed great crested newt waterbody in relation to the Site is provided in Appendix L.</p>	<p>Given the risk of encountering great crested newts on-Site, vegetation clearance works would require a licence from NRW to allow the removal of suitable terrestrial habitat.</p> <p>This would require mitigation to be implemented, which would be subject to approval by NRW but is likely to include:</p> <ul style="list-style-type: none"> • A site-specific tool-box talk should be given to all staff prior to works commencing; • Supervision of any clearance, dismantling of suitable newt refugia and fingertip search (as needed) prior to works; • Creation of refugia in the form of 20 log piles within the retained woodland and edge habitat; and • Replacement of suitable terrestrial habitat in the form of off-site creation of woodland and open grassland glades (Llanwern On-Site and Off-Site Mitigation and Monitoring Plan (Report Ref: 367590-WTD-CAR-2650, Mott MacDonald Ltd 2018).).
Reptiles	Within the woodland, tall ruderal and scrub habitats.	<p>Reptiles are afforded varying degrees of protection under WCA.</p> <p>All reptiles are listed under Section 7 Species of</p>	<p>The survey area contains suitable habitat to support this species group such as tall ruderal, ephemeral/short perennial vegetation and woodland. Log piles and refugia are also present for hibernating reptiles.</p>	<p>Any vegetation clearance should be undertaken in a phased manner under ecological supervision.</p> <p>Vegetation clearance should be undertaken between April and the end of October, whilst reptiles are active</p>

Feature	Location and Value	Level of Protection	Assessment	Mitigation
		Principal Importance under the Environment (Wales) Act 2016.	Any vegetation clearance in these areas could kill or injure reptiles and could cause an offence. The works will also result in long-term loss of habitat for this species and displacement of individuals to other areas. A plan identifying the locations of reptiles in relation to the Site is provided in Appendix N.	following a reptile sensitive methodology as detailed in Appendix O. A toolbox talk should be provided to all those working on-Site. If evidence of reptiles is found, work should cease until advice has been obtained from the site ecologist. In the long-term, mitigation for habitat lost will be compensated for through: <ul style="list-style-type: none"> • Creation of refugia in the form of 20 log piles within the retained woodland and edge habitat; and • Replacement of suitable terrestrial habitat in the form of off-site creation of woodland and open grassland glades (Llanwern On-Site and Off-Site Mitigation and Monitoring Plan (Report Ref: 367590-WTD-CAR-2650, Mott MacDonald Ltd 2018).).
Invertebrates	Woodland, scrub, reens, ephemeral/ short perennial and tall ruderal habitats.	Beaded chestnut, blood-vein, buff ermine, large wainscot, rustic, September thorn, and small emerald are listed under Section 7 Species of Principal Importance under the Environment (Wales) Act 2016.	Habitats within the survey area such as woodland, reens or OMH are suitable to support common and notable invertebrate species. Nationally scarce invertebrates have been recorded within the survey area including <i>Anobium inexpectatum</i> , <i>Meligethes fulvipes</i> and <i>Hippodamia variegata</i> . The proposals will temporarily result in some loss of OMH, although it is also more OMH will be created following the installation of the new stabling line.	On-Site habitat management will be implemented within Llanwern On-Site and Off-Site Mitigation and Monitoring Plan (Report Ref: 367590-WTD-CAR-2650, Mott MacDonald Ltd 2018) to maintain habitat diversity and enhance habitat quality of retained habitats, which will benefit the invertebrate assemblage as a whole (Report Ref: RHE350.001, Rachel Hacking Ecology, 2018). In particular, the planting strategy will include foodplants known to support notable invertebrates.
Invasive species	Himalayan balsam and Virginia creeper were recorded on-Site.	These plant is listed on Schedule 9 of the WCA in England and Wales.	The surrounding survey area and the Site support invasive species such that any construction work could cause these plants to spread.	Measures to prevent the spread of these species should be implemented through a Construction Environmental Management Plan (CEMP) to ensure good practice is followed during construction. Long-term control should be implemented through an invasive species control or eradication strategy.

5.2.4 Compensatory Land – Habitats

The Technical Note presented in Appendix E describes the habitats present within the compensatory land, the identified potential for constraints and an assessment of potential impacts during proposed off-Site habitat creation. In summary, the habitats present within the compensatory land included:

- Marshy grassland;
- Semi-improved neutral grassland;
- Improved grassland;
- Scattered scrub; and
- Scattered trees.

6 Enhancements

At national level, Chapter 5 of Planning Policy Wales (which relates to conserving and enhancing the natural environment) requires Local Authorities to take measures to promote the conservation of landscape and biodiversity. Further, at a local level, General Development Principle GP5 – Natural Environment, within Newport’s Local Development Plan (adopted 2015) sets out the objectives for the protection and enhancement of the natural environment and specifically state *‘Developers must seek to enhance biodiversity, whatever the current level’*.

It is therefore recommended that, to comply with the above planning policy, the opportunity is taken to incorporate ecological enhancements into the Scheme design. However, based on the current proposals, the following enhancements are considered to be appropriate:

- **Large-scale Off-Site Habitat Creation:** The creation of a large area of woodland planting is proposed to the north of the Site (see Llanwern On-site and Off-site Mitigation Plan (Reference: 367590-WTD-CAR-2650, Mott MacDonald Ltd, 2018). Whilst this is proposed as mitigation for dormice and woodland loss, it will provide a net enhancement to the landscape in terms of habitat and connectivity for species such as bats and birds;
- **New Landscape Planting On-Site:** New landscape planting will incorporate native species or species of wildlife value (i.e. fruit bearing shrubs). New and retained habitats will be subject to ecologically sensitive management (i.e. timing of cutting to ensure flowers or fruits are available to wildlife). Detailed landscape plans are available within the Llanwern On-Site and Off-Site Mitigation and Monitoring Plan (Report Ref: 367590-WTD-CAR-2650, Mott MacDonald Ltd 2018);
- **Habitat Management:** Sensitive timing of on-going management will be incorporated into a management plan which will enhance the remaining habitat on-Site and the replacement habitat off-Site in the long-term. Details of habitat management are available within the Llanwern On-Site and Off-Site Mitigation and Monitoring Plan (Report Ref: 367590-WTD-CAR-2650, Mott MacDonald Ltd 2018);
- **Bat Boxes:** New bat boxes will be installed on trees to provide replacement and enhanced roosting opportunities within the Site;
- **Bird Boxes:** New bird boxes could be installed on trees to provide enhanced nesting opportunities for birds within the Site;
- **Artificial Refugia:** Cut vegetation and trees will be retained to create refugia and log piles within retained woodland and along edge habitats to provide opportunities for reptiles, amphibians and invertebrates;
- **Retention of Deadwood:** Within the woodland, where possible, standing and fallen deadwood should be retained to provide opportunities for saproxylic invertebrates; and
- **Insect Boxes:** Insect boxes can be installed in retained areas of woodland at Site boundaries to provide enhanced nesting opportunities for invertebrates.

7 Conclusions

An Ecological Impact Assessment was undertaken to assess the potential impact on protected and notable habitats and species from the Scheme. The Site is located in an industrial area, with a number of designated sites within 2.0km (including the Gwent Levels SSSIs). The survey area has suitable habitats to support a number of species and the following species have been confirmed on-Site or within close proximity to the Site; breeding birds (including Schedule 1 species), dormice, badgers, water vole, bats (roosting, foraging and commuting), great crested newts, reptiles and invertebrates. Otters have not been recorded within the survey area or the surrounding 250m, however, it is considered that Monks' Ditch is suitable for foraging otters. The invasive plant species Himalayan balsam and Virginia creeper have also been recorded within the Site and the survey extent.

Appropriate recommendations for mitigation have been made in the form of check surveys, method statements, mitigation strategies, safeguard measures, best practice pollution prevention, long-term habitat compensatory planting and on-Site habitat management in order to reduce potential effects on habitats and species.

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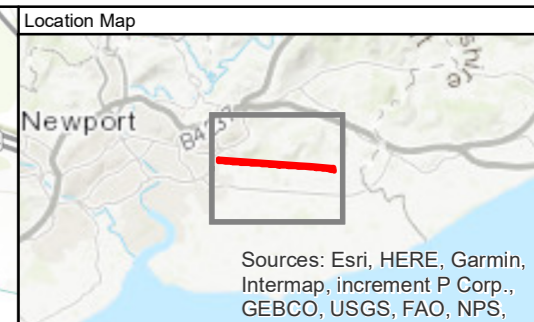
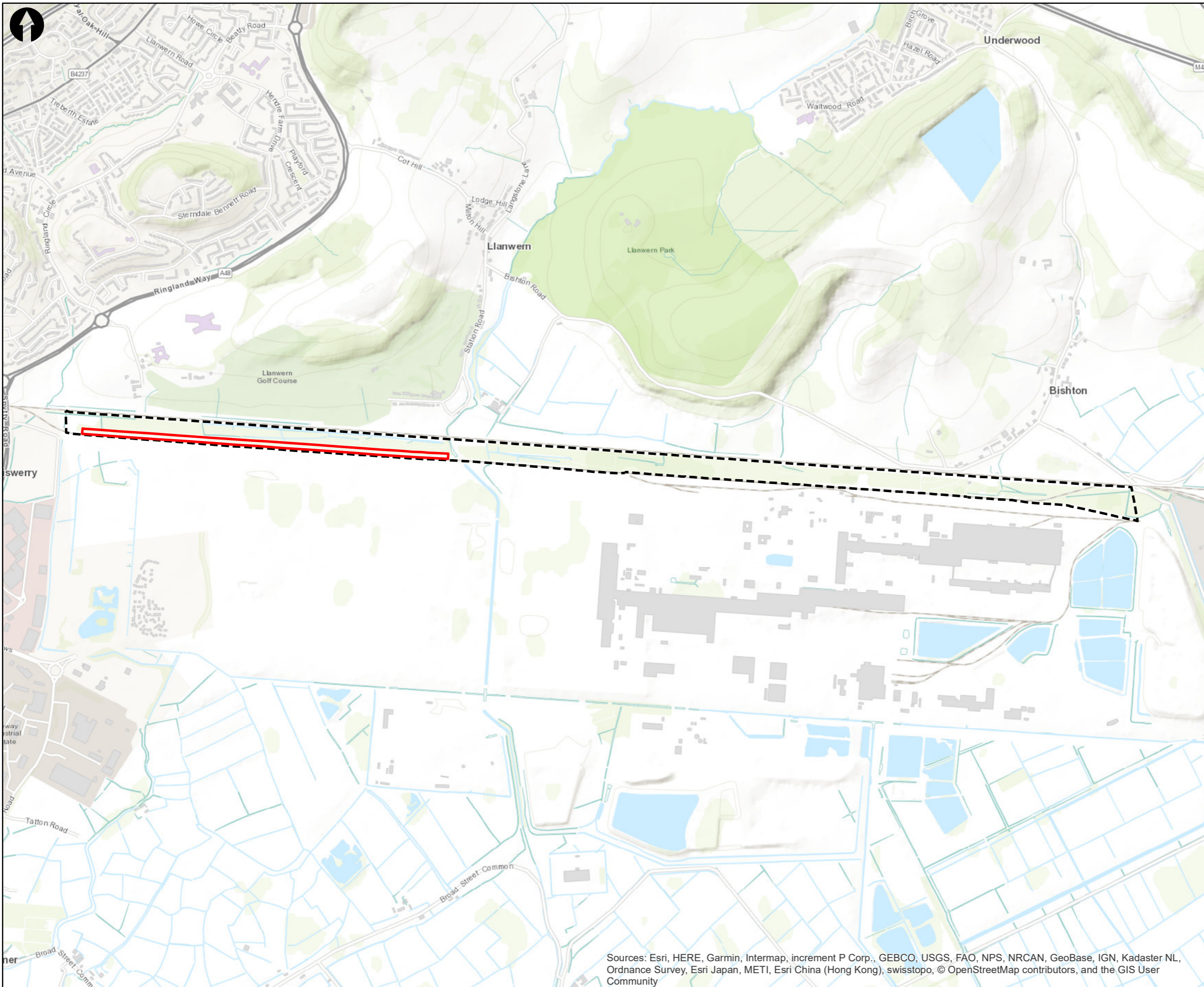
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A. Site Location Plan



Key to Symbols

	Site extent
	Survey area

Notes

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Rev	Date	Drawn	Description	ZCM	XX
P1	24/09/18	TR	For information	ZCM	XX

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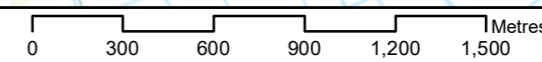
Transport for Wales
 Southgate House
 Wood Street
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 United Kingdom

Title

South Wales Metro - Task Order 26
 Llanwern Site Location Plan

Designed	Z Costas	ZC	Eng. Check	Z Costas	ZCM
Drawn	T Ruff	TR	Coordination	L Woolley	LKW
GIS Check	G O'Donovan	GO	Approved	XX	XX
Scale at A3	Status	Rev	Security		
1:25,000	INF	P1	STD		

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community



B. Species Specific Legislation

The following information in this appendix relates to species assessed within this document as being potentially affected by the proposed works and is a summary version of the full legislative text only. The relevant acts referred to in this appendix should be referred to for the full legislative text.

Breeding Birds

All breeding birds are protected under the Wildlife and Countryside Act (WCA) 1981 (as amended) which prohibits the intentional killing, injuring or taking of any wild bird (and) the taking, damaging or destroying eggs or of the nest (whilst being built or in use). Schedule 1 bird species are afforded greater protection under the WCA. It is an offence to disturb Schedule 1 birds or the dependants in the vicinity of their nest site.

Badgers

Badgers and their setts are protected under the Protection of Badgers Act 1992. This makes it an offence to:

- Directly or indirectly kill, injure or take badgers;
- Cruelly ill-treat a badger;
- Dig for badger;
- Intentionally or recklessly damage or destroy a badger sett, or obstruct access to it;
- Cause a dog to enter a badger sett; and
- Disturb a badger when it is occupying a sett.

Otters

Otter are a European Protected species and are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and the Conservation of Habitats and Species Regulations 2017. It is an offence to:

- Intentionally or deliberately kill;
- Injure or take an otter;
- Intentionally or deliberately damage;
- Destroy or obstruct access to any structure or place used for shelter or protection by an otter; and
- To intentionally or deliberately disturb an otter while it is occupying a structure or place which it uses for that purpose.

Water Vole

Water vole are a European Protected species and are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and the Conservation of Habitats and Species Regulations 2017. It is an offence to:

- Intentionally capture, kill or injure water voles;
- Damage, destroy or block access to their places of shelter or protection (on purpose or by not taking enough care);

- Disturb them in a place of shelter or protection (on purpose or by not taking enough care); and
- Possess, sell, control or transport live or dead water voles or parts of them (not water voles bred in captivity).

Bats

All bat species are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitat and Species Regulations 2017. This means it is illegal to intentionally or deliberately kill, injure, disturb or capture these species or damage, destroy or obstruct access to any structure, breeding or resting place used by them.

Reptiles

Reptiles have varying degrees of protection under the Wildlife and Countryside Act 1981 (as amended). The four wide spread species of reptiles that are protected under Schedule 5 are common lizard (*Zootoca vivipara*), slow-worm (*Anguis fragilis*), grass snake (*Natrix natrix*) and adder (*Vipera berus*). This means it is prohibited to intentionally kill, injure or trade these species.

Great Crested Newt

Great crested newts (GCN) are fully protected under the Conservation of Habitat and Species Regulations 2017 and the WCA. This means that is an offence to intentionally or recklessly kill, injure or take GCN. In addition, the following are also in breach of the legislation: To possess or control any live or dead specimen or anything derived from a GCN; to intentionally or recklessly damage, destroy or obstruct access to any structure or place used as shelter or protection by a GCN; to intentionally or recklessly disturb a GCN while it is occupying a structure or place, which it uses for that purpose. The legislation applies to all life stages of GCNs.

Invertebrates

Beaded chestnut, blood-vein, buff ermine, large wainscot, rustic, September thorn, Slender Ground-hopper and small emerald are listed under Section 7 Species of Principal Importance under the Environment (Wales) Act 2016.

C. Email Correspondence

From: Costas-Michael, Zoe M [<mailto:Zoe.Costas-Michael@mottmac.com>]
Sent: 15 March 2018 13:32
To: Smith, Rachel <Rachel.Smith@cyfoethnaturiolcymru.gov.uk>
Subject: RE: Llanwern Rail Facilities - Bat Trees

Hi Rachel,

Please can you give me a call to discuss the below?

Best wishes,

Zoë Costas-Michael

MSc BSc ACIEEM

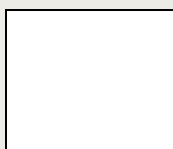
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From: Costas-Michael, Zoe M
Sent: 15 February 2018 15:39
To: 'Smith, Rachel' <Rachel.Smith@cyfoethnaturiolcymru.gov.uk>
Subject: Llanwern Rail Facilities - Bat Trees

Hi Rachel,

As discussed in the meeting in December, we have a number of trees with the potential to support a bat roost throughout the woodland at Llanwern.

We are hoping to send out tree climbers next month and also undertake dusk emergence/dawn re-entry surveys later in the season on those trees with features to support a bat roost. As there many trees with bat potential we were hoping to agree the following scope for those trees containing ground level features:

- Endoscopy of trees with ground level features a minimum of three times for high potential trees between May and July at least two weeks apart; and
- Endoscopy of trees with ground level features a minimum of two times for moderate potential trees between May and July at least two weeks apart.

We currently have five confirmed roosts, five high potential trees and 11 moderate trees that contain PRF's at ground level.

If like to discuss this please feel free to call me on the number below or on my mobile – 07713193125.

Thanks,

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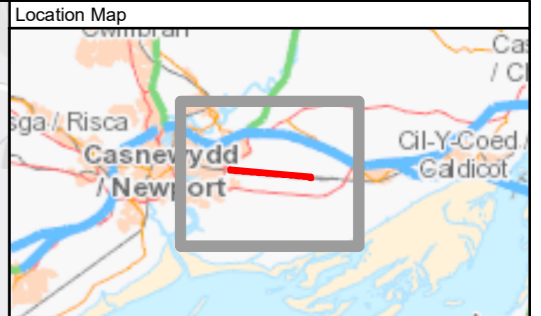
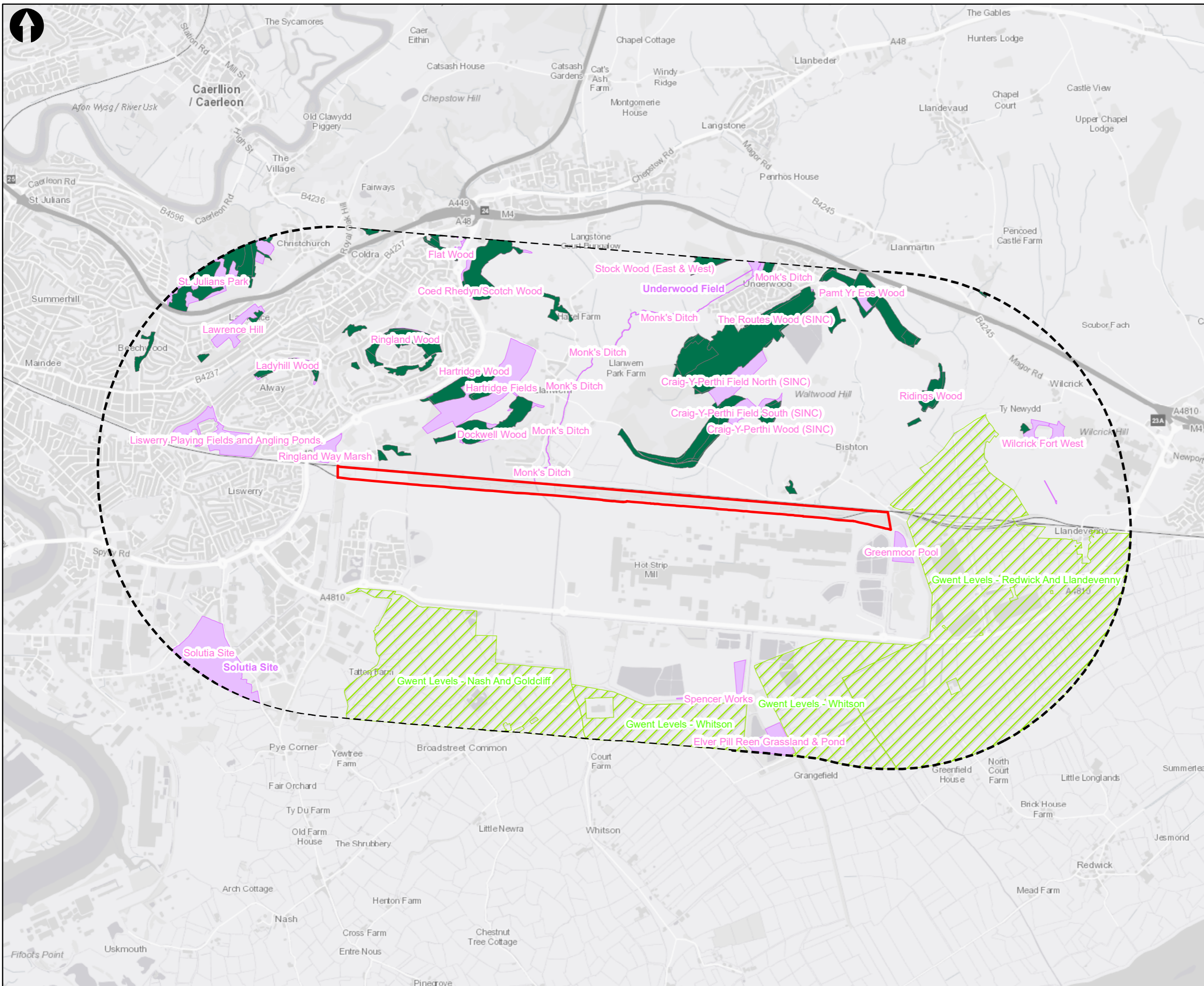
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D. Designated Sites Plan



Key to Symbols

- Survey area
- Site buffer (2km)
- Site of Special Scientific Interest (SSSI)
- Site of Importance for Nature Conservation (SINC)
- Ancient woodland

Notes

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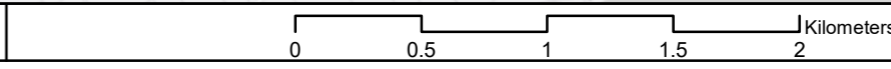
Transport for Wales
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Title

South Wales Metro - Task Order 26
 Designated Sites Drawing

Designed	A Bone	AB	Eng Check	Z Costas	ZCM
Drawn	A Bone	CE	Coordination	Z Costas	ZCM
GIS Check	C Houliker	CH	Approved	C Probert	ECP
Scale at A3	Status	Rev	Security		
1:30,000	INF	P1	STD		

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Drawing Number
367590-MMD-26-XX-DR-C-0252

E. Compensatory Land Technical Note and Phase 1 Habitat Plan

Project:	Llanwern Rail Facilities		
Our reference:	367590-WTD-CAR-2659	Your reference:	
Prepared by:	Z Costas-Michael	Date:	26/09/2018
Approved by:	E C Probert	Checked by:	L Woolley
Subject:	Compensatory Land: Ecological Assessment and Recommendations		

1 Introduction

1.1 Background and Site Location

Mott MacDonald Ltd have been commissioned by Transport for Wales, on behalf of Welsh Government to undertake a baseline ecological assessment of land to the north of the Llanwern Steelworks site. This site is proposed for compensatory woodland planting for the Llanwern Rail Facilities scheme near to the village of Llanwern, South Wales (Ordnance Survey Grid Reference ST 36907 87302).

The purpose of this technical note is to document the baseline conditions of the land and identify any ecological constraints to inform the planting scheme and the viability of the area as a 'compensation site' (to which it is referred throughout the remainder of the note).

The compensation site covers an area of approximately 20.0ha and is located 0.8km north of the Llanwern Steelworks at OS Grid Reference ST 38496 88269 adjacent to the existing Tata Steel owned reservoir. The Llanwern Rail Facilities scheme is split into 5 phases and for Phase 1 the loss of woodland is anticipated to be a quantum of an approximately of 2.9ha.

A compensation ratio of 2:1 was agreed with Natural Resources Wales, and on that basis it is proposed to compensate for this loss with approximately 5.8ha of new woodland planting (some on site and some off-site; see Llanwern On-site and Off-site Long-term Management Plan and Llanwern On-site and Off-site Mitigation Plan, Report Ref: 367-590-WTD-CAR-2649 and 367-590-WTD-CAR-2648, Mott MacDonald 2018 for more details). The proposed compensation site is indicated as the red lined area within the site location plan provided in Figure 1 below:

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Figure 1: Compensation Site Location Plan

Source: DoBH, OS, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA | DigitalGlobe, Microsoft

2 Methodology

2.1 Field Survey

An initial field survey was undertaken by an experienced ecologist on the 13 September 2018. All habitats within the site, where accessible, were identified and mapped in compliance with the 'Handbook for Phase 1 Habitat Survey: a technique for environmental audit' (Joint Nature Conservation Committee guidelines (JNCC), 2010). Dominant plant species were noted, as were any protected, uncommon or invasive species listed in Schedule 9 of the Wildlife and Countryside Act (WCA)1981. An assessment was also undertaken of the likely presence or absence of protected and notable species within the Zone of Influence (Zoi) of the proposed works (i.e. areas within or adjacent to the site boundary that may be impacted by the proposed works). This was based on the known distribution of species, habitat suitability and/or direct evidence such as field signs or observations. The methodologies and assessment criteria used were based on current published guidance.

2.1.1 Identification of Waterbodies



The relevant 1:25,000 scale Ordnance Survey (OS) sheet and aerial photography were searched to check for waterbodies within 250m of the site boundary as recommended in the Great Crested Newt (GCN) Conservation Handbook (Langton *et al.*, 2001).



3 Survey Results

3.1 Habitats

The Extended Phase 1 Habitat Map is provided in Appendix A with associated target notes in Appendix B. Target notes are referred to as TN1, TN2 etc. in Table 1 below.

Table 1: Habitats as described in the Handbook for Phase 1 Habitat Survey (JNCC, 2010)

Habitats	Descriptions	Photo
Marshy Grassland	<p>The majority of the site is marshy grassland which extends across the hillside to the south-west.</p> <p>The habitat is dominated by hard rush (<i>Juncus inflexus</i>) with frequent creeping thistle (<i>Cirsium arvense</i>). Grass species present include crested dog's tail (<i>Cynpsurus cristatus</i>), perennial rye-grass (<i>Lolium perenne</i>), Yorkshire fog (<i>Holcus lanatus</i>) and red fescue (<i>Festuca rubra</i>). Occasional quaking grass (<i>Briza media</i>) was also recorded.</p> <p>As the site slopes to the south, a larger diversity and coverage of rush species were recorded including soft rush (<i>Juncus effusus</i>) and compact rush (<i>Juncus conglomeratus</i>).</p> <p>Glaucous sedge (<i>Carex flacca</i>) and false fox sedge (<i>Carex vulpina</i>) were occasionally recorded within the grassland.</p> <p>Other ground flora recorded on site include agrimony (<i>Agrimonia eupatoria</i>), tormentil (<i>Potentilla erecta</i>), meadow buttercup (<i>Ranunculus acris</i>), white clover (<i>Trifolium repens</i>) and stinging nettle (<i>Urtica dioica</i>).</p>	
Semi-improved Grassland (Neutral)	<p>To the south west of the reservoir lies an area of semi-improved grassland.</p> <p>The habitat is dominated by crested dog's tail, with abundant creeping thistle. Red fescue, Yorkshire fog and false-oat grass (<i>Arrhenatherum elatius</i>) were also recorded. Broad-leaved dock (<i>Rumex obtusifolius</i>) was abundant throughout the grassland.</p> <p>Occasional species recorded includes autumn hawkbit (<i>Leontodon autumnalis</i>), mouse-ear hawkweed (<i>Pilosella officinarum</i>), common daisy (<i>Bellis perennis</i>), cock's foot (<i>Dactylis glomerata</i>), red clover (<i>Trifolium pretense</i>), creeping buttercup (<i>Ranunculus repens</i>) and occasionally small patches of hard rush.</p> <p>Along the edge of the grassland, near the fenceline for the reservoir, the species diversity increased to include agrimony, common centuary (<i>Centrurium erthraea</i>), common mouse-ear, quaking grass, dove's-foot cranesbill (<i>Geranium molle</i>) and lesser trefoil (<i>Trifolium dubium</i>).</p> <p>Scattered scrub and trees were recorded to the west of the grassland which comprised native species such as hazel (<i>Corylus avellana</i>), hawthorn (<i>Crataegus monogyna</i>), oak (<i>Quercus robur</i>), silver birch (<i>Betula pendula</i>) and dog rose (<i>Rosa canina</i>).</p>	

Habitats	Descriptions	Photo
Improved Grassland	To the east of the reservoir, there is an area of improved grassland grazed by sheep. It largely comprises perennial rye-grass, crested dog's tail and red fescue. Creeping thistle, greater plantain (<i>Plantago major</i>), knotgrass (<i>Polygonum aviculare</i>), nettle, common daisy, mouse-ear hawkweed and common dandelion (<i>Taraxacum officinale</i> agg.) were also recorded in this habitat.	
Species Poor Hedgerow	To the south of the reservoir lies a species-poor hedgerow. The hedgerow was heavily managed and comprised hawthorn (<i>Crataegus monogyna</i>) and bramble.	
Earth Bank	An earth bank was recorded in the semi-improved grassland, largely colonised by tall ruderal vegetation. Species recorded on the earth bank include great willowherb (<i>Epilobium hirsutum</i>), nettle, ground ivy (<i>Glechoma hederacea</i>), creeping thistle, cock's-foot, Yorkshire fog and low growing bramble.	
Fence	A number of fences were recorded along field margins to separate livestock currently using the fields.	N/A

Source: Mott Macdonald Ltd

On the basis of the above results, the majority of habitats within the site are considered to be of negligible to low ecological value, comprising a limited range of common and widespread species. Nonetheless, the marshy grassland and the semi-improved grassland have been assessed against local Site of Importance for Nature Conservation (SINC) criteria (see Table 2 below).

Outside of the compensation site, woodland is present to the north and west of the reservoir which connects to further areas of woodland and hedgerows to the south and wider landscape. The adjacent woodland was surveyed from the site boundary and was noted to mostly comprise native species such as oak, silver birch (*Betula pendula*), ash (*Fraxinus excelsior*), beech (*Fagus sylvatica*) as well as sycamore (*Acer pseudoplatanus*). The visible understorey comprises hazel, hawthorn and holly (*Ilex aquifolium*) with ground flora present including woodruff (*Galium odoratum*), dog's mercury (*Mercurialis perennis*), ivy (*Hedera helix*) and lord's-and-ladies (*Arum maculatum*). This adjacent habitat is an ancient semi-natural woodland referred to as 'The Routes Wood' which is designated as a SINC (see Appendix A).

3.2 Identification of Waterbodies

The desk study identified the reservoir within 250m of the compensation site. The reservoir is a concrete structure approximately 300m in width which is used as a water source by Tata Steel Llanwern works to the south.

3.3 Species

Evidence of any protected or notable species was noted during the survey, along with an assessment of the suitability of the site to support such species and whether these would pose a constraint to proposed works. This is summarised below.

3.3.1 Breeding Birds

Gull species were recorded flying over the site during the species survey. The marshy grassland provides suitable habitat for ground nesting birds whilst the scattered scrub and trees also provide suitable nesting opportunities for birds. The adjacent woodland and reservoir also provide suitable habitat for breeding and overwintering birds.

3.3.2 Bats

No evidence of bats was observed during the survey. However, the grasslands are considered to provide suitable foraging and commuting habitats for bats. Scattered trees on site were noted to contain potential roost features (PRFs) such as knot holes and lifted bark, although these were not individually assessed for their roost suitability. The adjacent woodland also provides roosting, foraging and commuting habitat for bats.

3.3.3 Badgers

No evidence of badger was observed during the survey. The grasslands are considered suitable foraging habitat for badger. The adjacent woodland is also suitable for sett creation and foraging badgers.

3.3.4 Great Crested Newt

No evidence of great crested newt was observed during the survey. There is suitable terrestrial habitat for great crested newts in the form of semi-improved and marshy grassland. The stream is flowing and is deemed unsuitable to support great crested newts. The reservoir lacks any aquatic vegetation and has a high presence of water fowl. Therefore, it is considered that there are no suitable waterbodies within 250m of the site to support great crested newt and therefore this species is not considered to represent a constraint to the proposals.

3.3.5 Reptiles

No evidence of reptiles was observed during the survey. There is suitable habitat within the grasslands to support common reptile species.

3.3.6 Invertebrates

Large white butterfly (*Pieris brassicae*) and grasshoppers were recorded within the marshy grassland. The semi-improved and marshy grassland provide suitable habitat for common invertebrate species.

4 Assessment of Ecological Constraints and Recommendations

The planting included in the Llanwern On-site and Off-site Long-term Management Plan and Llanwern On-site and Off-site Mitigation Plan (Report Ref: 367-590-WTD-CAR-2649 and 367-590-WTD-CAR-2648, Mott MacDonald 2018) would link the hedgerows and woodland south to The Routes Wood SINC providing connectivity to the wider landscape and a larger footprint of woodland in the local area (once established).

On the basis of the survey results, the below table identifies potential ecological constraints to the proposed planting from the current habitats and species that could potentially be using the site along with appropriate recommendations:

Table 2: Assessment of Constraints and Recommendations

Ecological Features	Assessment	Recommendations
Marshy Grassland	<p>The species present have been compared to the Guidelines for Selection of Wildlife Sites in South Wales (Gwent Wildlife Trust, 2004). According to the guidance, a marshy grassland should be considered species-rich if 12 or more of the species listed in this document are recorded on site. A total of four of these species were recorded within the marshy grassland, including; quaking grass, tormentil, compact rush and glaucous sedge.</p> <p>The grassland is therefore not considered to be of SINC quality whilst based on the overall species assemblage and structure, this grassland is not considered to be of particular ecological value at a local level.</p>	N/A
Semi-improved Grassland (Neutral)	<p>The species present have been compared to the Guidelines for Selection of Wildlife Sites in South Wales (Gwent Wildlife Trust, 2004). According to the guidance, a semi-improved neutral grassland should be considered species-rich if eight or more species or more of the species listed in this document are recorded on site. A total of four of these species were recorded on site, including, red clover, agrimony, quaking grass and mouse-ear hawkweed.</p> <p>The grassland is therefore not considered to be of SINC quality whilst based on the overall species assemblage and structure, this grassland is not considered to be of particular ecological value at a local level.</p>	N/A

Ecological Features	Assessment	Recommendations
Improved Grassland	The improved grassland is of low ecological value with limited grasses and few common herb species.	N/A
Other Habitats	The remaining habitats within the site comprise species which are common and widespread at a local level and therefore do not pose a constraint.	
Breeding Birds	The marshy grassland may be suitable to support ground nesting birds. Planting within this habitat may disturb or destroy nests.	<p>All planting works should be undertaken outside the nesting season. This is widely considered to be from March to August inclusive, but can vary depending on the species and / or seasonal conditions.</p> <p>It is unlikely that planting will be undertaken outside of the above time period due to the constraints of the planting season.</p> <p>In the unlikely event that planting is undertaken within the nesting period, pre-clearance check must be undertaken by an experienced ecologist to identify if any birds are nesting within or close to the vegetation due to be disturbed. If a bird nest is found, it must be left in-situ and protected from works. No works can be undertaken in that area until the young birds have fledged from the nest site, which may take up to 6 weeks depending on the species.</p> <p>All planting should be restricted where possible to daylight hours to prevent disturbance of roosting and nesting birds at dusk and dawn.</p> <p>A site-specific toolbox talk should be given to all site staff prior to works commencing.</p> <p>If evidence of breeding birds is found, work should cease until advice has been obtained from the site ecologist.</p>
Bats	The grassland is likely to provide habitat for foraging and commuting bats. Scattered trees may also provide roosting opportunities. Planting will increase the available habitat for roosting bats in futures years whilst still retaining suitable for foraging and commuting bats.	Retained trees should be protected in accordance with BS5837:2012.
Badgers	There is suitable habitat in the form of semi-improved grassland for foraging badgers. Planting within this habitat may extend the area available for sett creation whilst still retaining suitable for foraging badgers.	A site-specific toolbox talk should be given to all site staff prior to works commencing.
Reptiles	The semi-improved and marshy grasslands provide suitable habitat for reptiles. Reptiles may be killed or injured during planting works within the site.	<p>A site-specific toolbox talk should be given to all site staff prior to works commencing.</p> <p>Planting works are likely to be undertaken in the winter period. Any hibernacula suitable for reptiles should be avoided. If hibernacula cannot be avoided, it should be dismantled by hand by a supervising ecologist and re-instated along the edge of the new planting area. Any reptiles will be carefully moved by the supervising ecologist outside of the planting zone.</p> <p>Any clearance of vegetation to allow for planting should be conducted in a phased manner under the supervision of an experienced ecologist.</p> <p>If evidence of reptiles is found, work should cease until advice has been obtained from the site ecologist.</p>
Invertebrates	The semi-improved and marshy grasslands provide suitable habitat for common and widespread invertebrates. No food plants for protected or notable invertebrates were recorded during the survey	N/A

Ecological Features	Assessment	Recommendations
and the surrounding habitat in the form of Craig-y-Perthi Field South SINC and Craig-y-Perthi Field North SINC provides greater plant species diversity for this species group.		

Source: Mott MacDonald Ltd

5 Conclusions

A Phase 1 survey was undertaken to assess the baseline condition of the land to the north of the Llanwern Steelworks site for its suitability for use as compensatory land for the Llanwern Rail Facilities scheme.

No significant ecological constraints to the proposed planting works have been identified. Marshy grassland, semi-improved grassland, improved grassland, scattered trees, scattered scrub and an earth bank were recorded on site. The grasslands on site failed to meet the criteria for SINC selection according to current guidance (South Wales Wildlife Sites Partnership, 2004) whilst remaining habitats are considered of low ecological value. The site provides habitat for breeding birds, foraging and commuting bats, foraging badgers, reptiles and common invertebrates. Recommendations are provided in Section 4 to avoid impacting on these species during planting works whilst new planting will provide continued or enhanced opportunities for many of these species in the long-term.

6 References

Gwent Wildlife Trust (2004). Guidelines for Selection of Wildlife Sites in South Wales. South Wales Wildlife Sites Partnership. Available URL:

<http://www.sewbrec.org.uk/content/attachments/SouthWalesWildlifeSitesCompleteDoc.pdf>

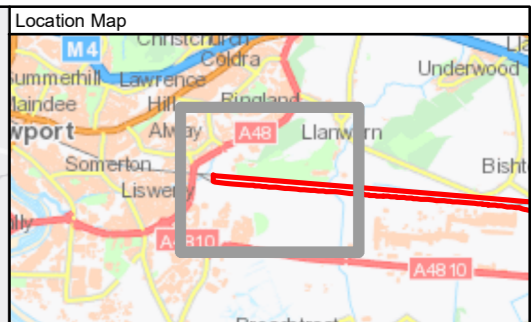
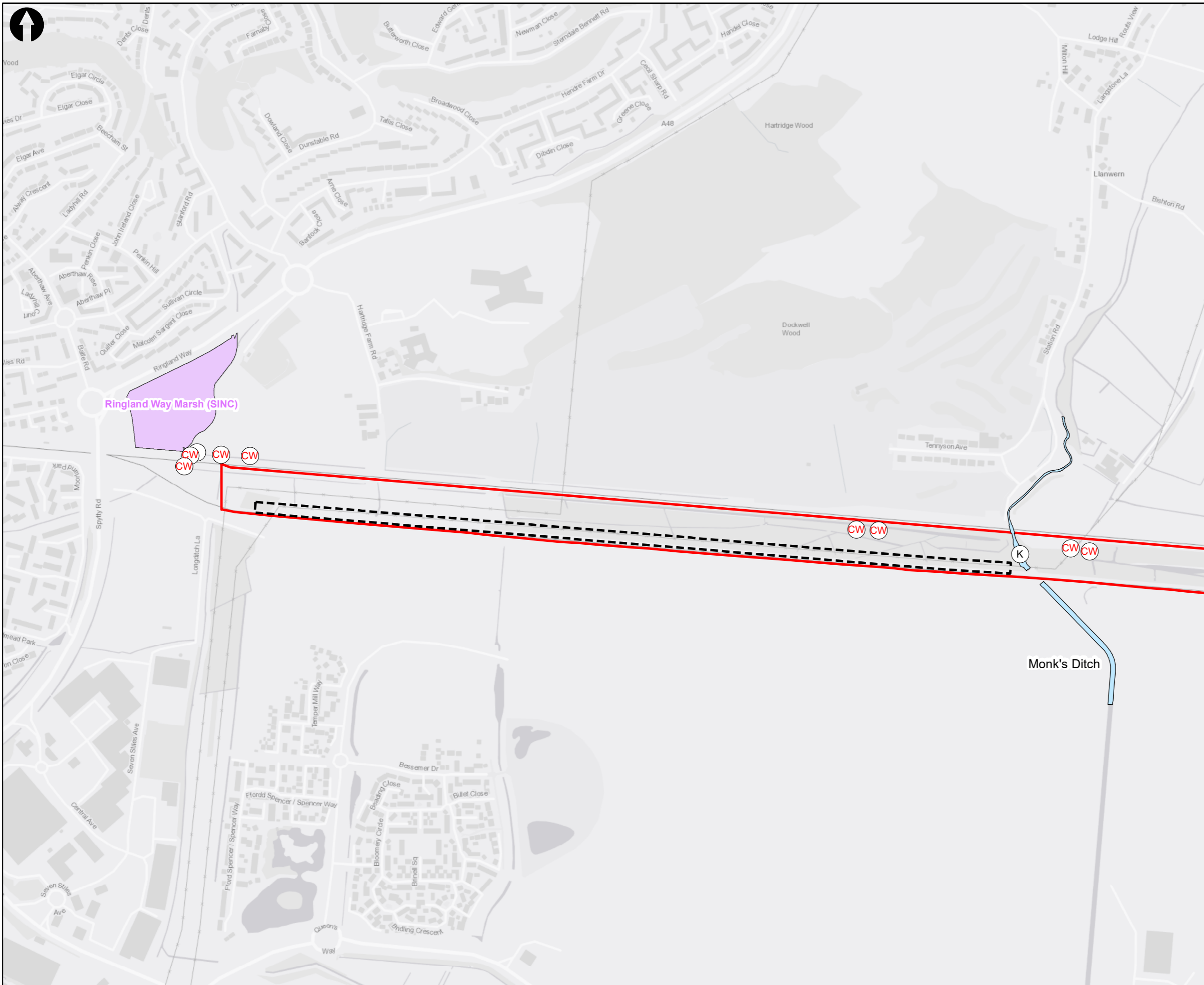
Joint Nature Conservation Council (JNCC) (2010). *Handbook for Phase 1 habitat survey – a technique for environmental audit*. Peterborough: JNCC Publications;

Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001). *Great Crested Newt Conservation Handbook*, Froglife, Halesworth.

Mott MacDonald Ltd (2018). Llanwern On-site and Off-site Long-term Management Plan (Report Ref: 367-590-WTD-CAR-2649)

Mott MacDonald Ltd (2018). Llanwern On-site and Off-site Mitigation Plan (Report Ref: 367-590-WTD-CAR-2648)

F. Schedule 1 Species Location Plan



Key to Symbols

- Site extent
- Survey area
- Site of Importance for Nature Conservation (SINC)
- K Kingfisher
- CW Cetti's Warbler

Waterbody

- Monk's Ditch

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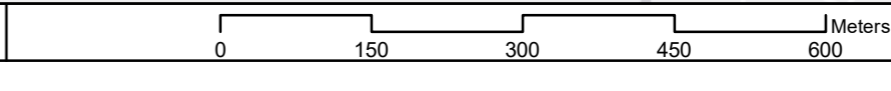
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Title

South Wales Metro - Task Order 26
Llanwern Bird Species & SINC's
Schedule 1 Location Plan

Designed	G Starr	GS	Eng Check	Z Costas	ZCM
Drawn	G O'Donovan	GO	Coordination	L Woolley	LKW
GIS Check	M Hayward	MH	Approved	C Probert	CP
Scale at A3	Status	Rev	Security		
1:7,500	INF	P1	STD		



G. Breeding Birds Method Statement



Llanwern Rail Facilities - Phase 1 Planning

Breeding Birds Method Statement

September 2018

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Llanwern Rail Facilities - Phase 1 Planning

Breeding Birds Method Statement

September 2018

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	24/09/18	Z Costas-Michael	C Williams	E C Probert	Draft issue – for TFW only
B	28/09/18	Z Costas-Michael	C Williams	E C Probert	Pre-Application Consultation

Document reference: 367590-WTD-CAR-2660

Information class: Standard

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A.		

1 Introduction

1.1 Project Description

Mott MacDonald (MM) has been commissioned by Transport for Wales (TfW), on behalf of Welsh Government, to prepare and submit a planning application, seeking full planning permission for the design and construction of a 1.6km long Major Events Stabling Line (MESL) on land adjacent to the existing Tata Steelworks Service Lines in Llanwern, South Wales. This is Phase 1 of the Llanwern Rail Facilities Programme.

The MESL will be used for stabling of rolling stock for major events in the area, to enable flexibility for future train requirements, and proving of trains prior to use on the rail network. The MESL will be electrified in a future phase of work. This proposed 1.6km length of MESL to the west of Monks' Ditch was formerly known as Option 6a.

The wider Llanwern Rail Facilities Programme will include an extension of the MESL by circa 2.4km east (to achieve a total length of circa 4km), electrification of the MESL, a new Llanwern railway station and passenger line (including Park & Ride and footbridge), and connections to the South Wales Main Line (Relief Lines). The further phases of the project will be the subject of a subsequent planning application.

- The key parameters for the Scheme are listed below:
- Whole Site area is 3.1 hectares. This land is contained within the red line boundary shown on the Site Location Plan (Drawing number 367590-MMD-48-XX-DR-C-0001); and
- The Site length is approximately 1.6km long and 19m wide.

1.2 Scope of Works

The General Arrangement drawings (Drawing numbers 367590-MMD-48-XX-DR-C-0002 to 367590-MMD-48-XX-DR-C-0005) demonstrate the project scope which includes the design and construction of the following:

- A single track stabling line (MESL) circa 1.6km long;
- Associated earthworks and landscaping; and
- Drainage and other engineering works.

In order to obtain full planning permission for Phase 1, we have carried out the outline design and technical assessment of the above scope, as well as multiple assessments in terms of ecology, environment, heritage and archaeology.

1.3 Site Location

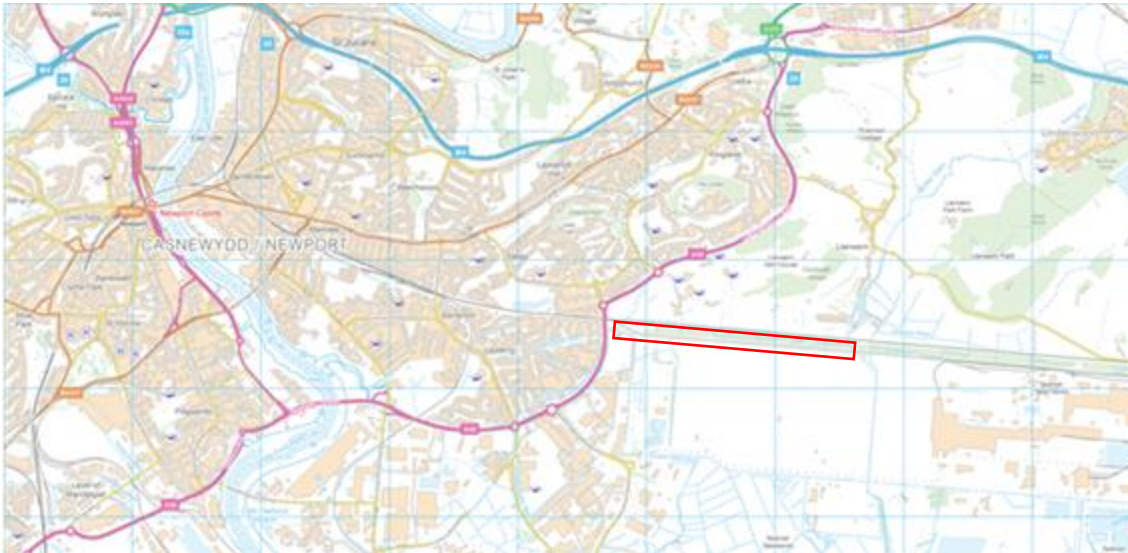
The proposed rail development Site is located approximately 8 miles east from the centre of Newport, South Wales (Figure 1.1).

The Site is aligned roughly west – east and bordered by the existing South Wales Mainline to the north and the Tata Steelworks to the south. Along the southern boundary of the steelworks site runs the A4810 which links the M4 from junction 23A at Magor with the A48 at Liswerry (a predominantly residential suburb on the south-eastern side of Newport). The Site is more widely bordered by the M4 which runs approximately two and a half miles to the north and the Severn

Estuary which lays approximately three miles to the south. The Gwent Levels to the south is a significant area of wetlands.

The existing South Wales Mainline passes north of the proposed site and provides opportunity for transport links for both passengers and freight.

Figure 1.1: Proposed Location Plan



Source: OS Open Data

1.4 Scope of the Report

This report sets out an ecological method statement for the protection of breeding birds during the construction at the site. The objectives of this report are to:

- Detail the assessment of the likely presence of breeding birds within the site;
- Identify the proposed works which could impact breeding birds;
- Set out an appropriate protocol to be followed by all contractors to ensure breeding birds are properly considered; and
- Provide appropriate site-specific mitigation safeguards and working methodology to protect breeding birds during all works.

2 Ecology Context

2.1 Ecology

Common species of bird typically nest between March and August (inclusive). Some species will have multiple broods during this time, with each fledging after approximately 6 weeks.

The types of habitat found within the survey boundary which are likely to support breeding birds include:

- Woodland/ woodland edge;
- Scrub;
- Reens; and
- Buildings.

Whilst natural habitats are the preferred nesting locations, it should be noted that it is common for birds to utilise vehicles and machinery that have been left idle on site.

2.1.1 Schedule 1 Species

Cetti's warbler (*Cettia cetti*) and kingfisher (*Alcedo atthis*) have been recorded as possibly and probably breeding respectively within the survey area. Cetti's warbler have also been recorded just outside of the survey area to the west as probably breeding at Ringland Way Marsh Site of Importance for Nature Conservation (SINC).

Cetti's warbler typically breeds between April and July and can have multiple broods within this period. The typical fledging time for young is estimated to be approximately 14 to 16 days (BTO, 2018 & RSPB, 2018). This species is typically associated with dense marshy vegetation such as reedbeds and other marginal vegetation close to waterbodies.

Kingfisher typically breeds between the end of March and July and can have multiple broods within this period. The typical fledging time for young is estimated to be approximately 25 days (10-12 days later when foraging is poor) (BTO, 2018 & RSPB, 2018). This species is typically associated with river systems and marshes.

2.2 Identification

Photographs below give examples of birds' nests that could be encountered during the vegetation clearance works:

Photo 1: Example birds nest found within the survey boundary



Source: Mott MacDonald Ltd

Photo 2: Example birds nest found within the survey boundary



Source: Mott MacDonald Ltd

2.3 Identifying an active nest

The ecologist will look for the following signs to identify if a nest is active or inactive:

- Fresh material, moss can remain green especially in nests lined with mud but other vegetation will rot over time;
- Do the ends of any twigs look fresh, overtime these will dry out;
- Fresh feathers; and
- Old evidence of broken shells and droppings.

Examples of nests an ecologist would be searching for can be found in the Toolbox talk in Appendix A.

3 Legislation

3.1 Legislation

All birds, their nests and eggs are legally protected under the Wildlife and Countryside Act 1981 (as amended) during the breeding season (considered to be March to August inclusive).

Whereby it is an offence to intentionally or recklessly:

- Kill, injure or take any wild bird;
- Take, damage or destroy the nest of any wild bird whilst it is in use or being built; or
- Take or destroy the egg of any wild bird.

Under the Wildlife and Countryside Act (WCA), a wild bird is defined as any bird of a species that is resident within the UK or is a visitor to the European Territory of any Member State in a wild state.

For birds listed on Schedule 1 of the WCA, it is also an offence to intentionally or recklessly:

- Disturb a species listed on Schedule 1 that is at, on or near an 'active' nest.

If works are intended near a nest of a Schedule 1 species a licence must be obtained from the relevant statutory body (Natural Resources Wales).

If any of the aforementioned offences are committed, then penalties for breaking the law can include large fines and / or possible imprisonment and seizure of equipment.

4 Ecological Baseline

4.1 Desktop Survey Results

A desk study was undertaken to identify key species and habitats near and adjacent to the survey boundary (South East Wales Biodiversity Records Centre (SEWBRc), 2017). The results are presented in the following sections.

4.1.1 Statutory Designated Sites

There is one statutory designated site, the River Usk (Lower Usk) / Afon Wysg (Wysg Isaf), that is noted for having a good range of breeding birds associated with riverine habitats (Countryside Council for Wales, 1996). Details of which are provided below in Table 1.

Table 1: Statutory Designated Site

Name	Status	Details	Distance and Direction
River Usk (Lower Usk)/ Afon Wysg (Wysg Isaf)	SSSI ¹	<p>The River Usk (Lower Usk) is a rare example of a large mesotrophic lowland river which has not been subject to significant modification by man. Of particular significance to the river's morphology and biology are the extensive deposits of fluvio-glacial and alluvial material in the Usk valley, between Abergavenny and Newport.</p> <p>The river shows a clear downstream succession in plant communities due in part to the rapid transition from mesotrophic to nutrient rich in its lower reaches and increasing salinity as it nears its confluence with the Severn Estuary.</p> <p>Whilst not a special feature of the site, there is a good range of breeding birds associated with the riverine habitats.</p> <p>The SSSI incorporates adjacent areas of riparian habitat which directly support the special interest of the river. These include woodlands dominated by alder (<i>Alnus glutinosa</i>) and willow (<i>Salix spp.</i>, marshy grassland, stands of tall herbs, swamp and fen vegetation, salt-marsh and coastal grassland.</p>	1.8km W

4.1.2 Non-Statutory Designated Sites

There are twenty-six non-statutory designated sites within 2.0km of the site, four of which note the presence of Cetti's warbler, these are detailed in Table 2 below:

Table 2: Non-Statutory Designated Sites (Referencing Cetti's Warbler)

Name	Status	Details	Distance and Direction
Ringland Way Marsh	SINC	Reed, swamp and marsh, with wet grassland areas; supports bird species including Cetti's warbler and reed bunting (a Species of Principal Importance).	Adjacent – W of the survey boundary
Greenmoor Pool	SINC	Formerly standing water which now supports reed swamp (a priority habitat), which itself	Adjacent – E of the survey boundary

¹ Site of Special Scientific Interest (SSSI)

Name	Status	Details	Distance and Direction
		supports bird populations including Cetti's warbler.	
Solutia Site	SINC	A series of improved and semi-improved grasslands with traditional ditches and ponds; site supports a range of species including nesting birds such as Cetti's warbler, and invertebrates including hairy dragonfly.	1.5km S
Elver Pill Reen, Grassland & Pond	SINC	Lagoon with mosaic of swamp and marshy and dry semi-improved neutral grassland; supports Cetti's warblers.	1.9km S

4.1.3 Biological Records

4.1.3.1 SEWBRc Data

A number of Schedule 1 bird species records were returned from within 2.0km of the site, many of which appear to be associated with open wetland habitats in the local area such as the Gwent Levels. Those considered of relevance to the site (given the habitats present) are listed in Table 3 below along with the number of records present and closest record for each species:

Table 3: Relevant Schedule 1 Bird Records within 2.0km of the Site

Species	Scientific Name	Number of records	Closest Record	
			Distance	Direction from the Site
Barn Owl	<i>Tyto alba</i>	1	1.1km	N
Cetti's Warbler	<i>Cettia cetti</i>	7	0.1km	NW
Kingfisher	<i>Alcedo atthis</i>	2	1.2km	SW

Source: SEWBRc

In addition, a number of records of 'priority species' (those listed as species of principal importance under Section 7 of the Environment (Wales) Act 2016) were returned from within 2.0km of the site:

- House sparrow (*Passer domesticus*);
- Dunnock (*Prunella modularis*);
- Song thrush (*Turdus philomelos*);
- Lapwing (*Vanellus vanellus*);
- bullfinch (*Pyrrhula pyrrhula*);
- Lesser spotted woodpecker (*Dendrocopos minor*);
- Grasshopper warbler (*Locustella naevia*);
- Black headed gull (*Chroicocephalus ridibundus*);
- Kestrel (*Falco tinnunculus*);
- Cuckoo (*Cuculus canorus*);
- Linnet (*Linaria cannabina*); and
- Starling (*Sturnus vulgaris*).

4.2 Breeding Bird Survey

A total of 42 species were recorded during the breeding bird surveys. Records of species for which there are statutory instruments governing their protection and a duty to conserve (herein referred to as notable species) include the following (note that some species are cited in more than one statutory and conservation categories):

- Two² species listed on Annex I of the Birds Directive or Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) or those recognised by the Rare Breeding Birds Panel (RBBP) were identified on site;
- Six species listed on the Newport Local Biodiversity Action Plan (LBAP); and
- Six species of principal importance;

'Birds of Conservation Concern', a measure to convey concern and help set priorities for conservation action (Eaton *et al.*, 2015), were recorded and include:

- Six Red Listed (BoCC) species;
- Ten Amber Listed (BoCC) species; and
- Twenty-six green Listed (BoCC) species.

4.2.1 Breeding Status

The breeding status of species and the status of protected and/or notable species summarised in Table 4 below:

Table 4: Notable species recorded during the surveys

Species	Breeding Evidence	Likely Territories			
		Sch 1	Section 7	LBAP	
Cetti's warbler	Possible	X		X	Yes – outside of the survey area adjacent to Ringland Way Marsh SINC
Kingfisher	Probable	X			Yes – recorded on two occasions at Monks' Ditch (including a pair)
Song Thrush	Probable		X	X	Yes – males recorded singing on two or more occasions in the same areas
Dunnock	Probable		X	X	Yes - males recorded singing on two or more occasions in the same areas
Bullfinch	Confirmed		X	X	Yes – males recorded in suitable habitat on two or more occasions in the same areas (also recorded carrying food)
Linnet	Possible		X	X	No – only recorded on a single occasion within the survey area

4.2.2 Schedule 1 Species

Cetti's warbler have been recorded as possibly breeding on site with a likely territory held to the west of the site, outside the survey area. Ringland Way Marsh SINC is designated due to reedswamp and marsh, with wet grassland areas which supports Cetti's warbler as per Table 2.

² Kingfisher was recorded incidentally during other surveys by ecologists.

The territories held likely incorporate the SINC habitats as this is typical habitat of breeding Cetti's warbler.

4.2.2.1 Kingfisher

Kingfisher have been recorded as probably breeding on site with a pair recorded at Monks Ditch. The banks of the watercourse provide suitable nesting habitats for this species and as such their presence on site cannot be ruled out.

5 Proposed Safeguards

5.1 Kingfisher Pre-Works Survey

Works near to Monks' Ditch should be targeted for clearance outside of the breeding bird period to avoid any potential impacts on kingfisher.

Prior to any works in close proximity to Monks' Ditch, an experienced ornithologist should survey the banks prior to any works commencing on site. This pre-works survey will determine activity on site and if this species is confirmed breeding on site. If kingfisher are found to be nesting within the banks of Monks' Ditch, a buffer would be required around active nesting burrows to avoid potential disturbance. This is to be agreed as part of consultation with the local authority and a suitably qualified ecologist.

It is anticipated that no direct works will be undertaken to Monks' Ditch itself.

5.2 Vegetation Clearance Methodology

Prior to any woody vegetation clearance that is required during the breeding season (March to August inclusive), a nesting bird check should be undertaken by a suitably qualified ecologist within 48 hours of the works commencing.

To check if a nest is active the following method will be employed:

- The ecologist will attend site prior to any contractors entering the area, when the area should be quieter. A search will be undertaken for nests using binoculars. Any potentially active nest or areas of dense vegetation where nests could be present should be watched (as well as the surrounding area) for any bird activity which may indicate nesting, including:
 - Birds carrying nest material, food or faecal sacs and note direction of flight;
 - Birds repeatedly singing from song posts, one of these is usually close to nest;
 - Birds on sentry duty, this is often near the nest;
 - Birds showing agitated behaviour and repeated calling;
 - Males accompanying females; males of some species accompany the female back to nest; and
 - Begging calls of chicks.
- Survey duration will depend on the area being checked. Checking individual trees could take less than 10 minutes whilst watching dense vegetation would require observing bird activity for at least half an hour. This will be judged by the ecologist on site; and
- In densely vegetated areas which cannot be fully inspected, ecological supervision of phased clearance will be undertaken, whereby accessible areas are checked, a cut is undertaken and then the next area is checked (and so on) until either the area is cleared or birds are found and cordoned off.

The ecologist will follow the methodology listed above to identify any active birds nests within of any proposed clearance works:

- If any Schedule 1 species or their nests are located on site, a buffer zone will be agreed as part of consultation with the local authority and with a suitably qualified ecologist; and

- If active nests of other, non-Schedule 1 species are recorded, a 5.0m buffer will be set up around the nest. No works will be undertaken within this buffer until the nest is has been confirmed inactive by an ecologist (after young have fledged).

5.2.1 General Construction Safeguards

In addition to the specific measures outlined above, general construction safeguards can be implemented to avoid the risk of birds using vehicles and other machinery. These are as follows:

- Avoid leaving vehicles and machines parked near boundary fences, walls and close to vegetation;
- Any gaps in excess of 22mm in diameter may be sufficient for birds to enter. Where possible, vehicles and other machinery that are idle can have any holes and ledges temporarily blocked with soft packaging materials;
- As set out above, daily checks of vehicles and other machinery, for nests should be undertaken before any vehicles or machines are started; and
- Any stockpiles on site should be netted to avoid bird species using gaps within the stockpiles.

6 References

British Trust for Ornithology (BTO) website. Available URL: <https://www.bto.org/>

Royal Society for the Protection of Birds (RSPB) website. Available URL:
<https://www.rspb.org.uk/>

South East Wales Biodiversity Records Centre (SEWBReC) (2017) *Biodiversity Information Search: Llanwern*

Appendices

A. Toolbox Talk

14

A. Toolbox Talk

TOOLBOX TALK: BREEDING BIRDS

More than 400 species of bird are regularly recorded in the UK. Different species have different preferences for nesting habitat.

Woodland, scrub, hedgerows and buildings are all potential nesting opportunities for breeding birds. Many birds also nest on the ground within short or tall vegetation, such as arable fields.

Evidence suggests that the site of proposed works may support breeding birds. Vegetation clearance between March and August inclusive can damage active bird nests.

LEGISLATION

Under UK law (*Wildlife and Countryside Act, 1981*) it is an offence to:

- intentionally kill, injure or take any wild bird;
- to take, damage or destroy the nest (whilst being built or in use) or eggs of any wild bird;
- To possess a wild bird (dead or alive) or their eggs.

Penalties for breaking the law can include **large fines, imprisonment** and the **seizure of equipment**.

ESSENTIAL PRE-WORKS CHECK

It is essential that prior to any works involving clearance or disturbance of vegetation a check for birds nests must be undertaken. **A CHECK FOR BIRDS NESTS WILL NEED TO BE UNDERTAKEN IMMEDIATELY BEFORE THE COMMENCEMENT OF WORKS AND ON EVERY DAY THAT WORKS ARE TO TAKE PLACE.**

THINK....

- Are there many birds active around the area to be affected?
- How are they behaving – behaviour that indicates breeding activity includes:
- Birds carrying nesting material (twigs, leaves, hair)
- Birds regularly flying to and from the same spot
- Birds repeatedly calling or behaving in an agitated/alarmed way
- Juvenile birds being fed by adult

If you are unsure, contact the Project Environmental Representative.



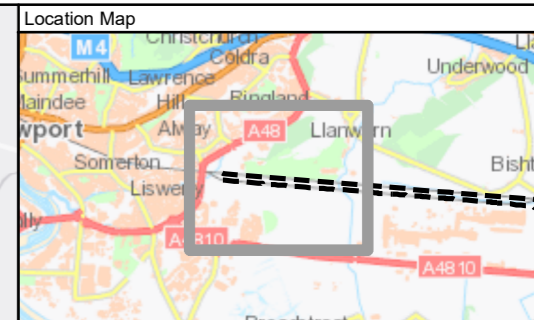
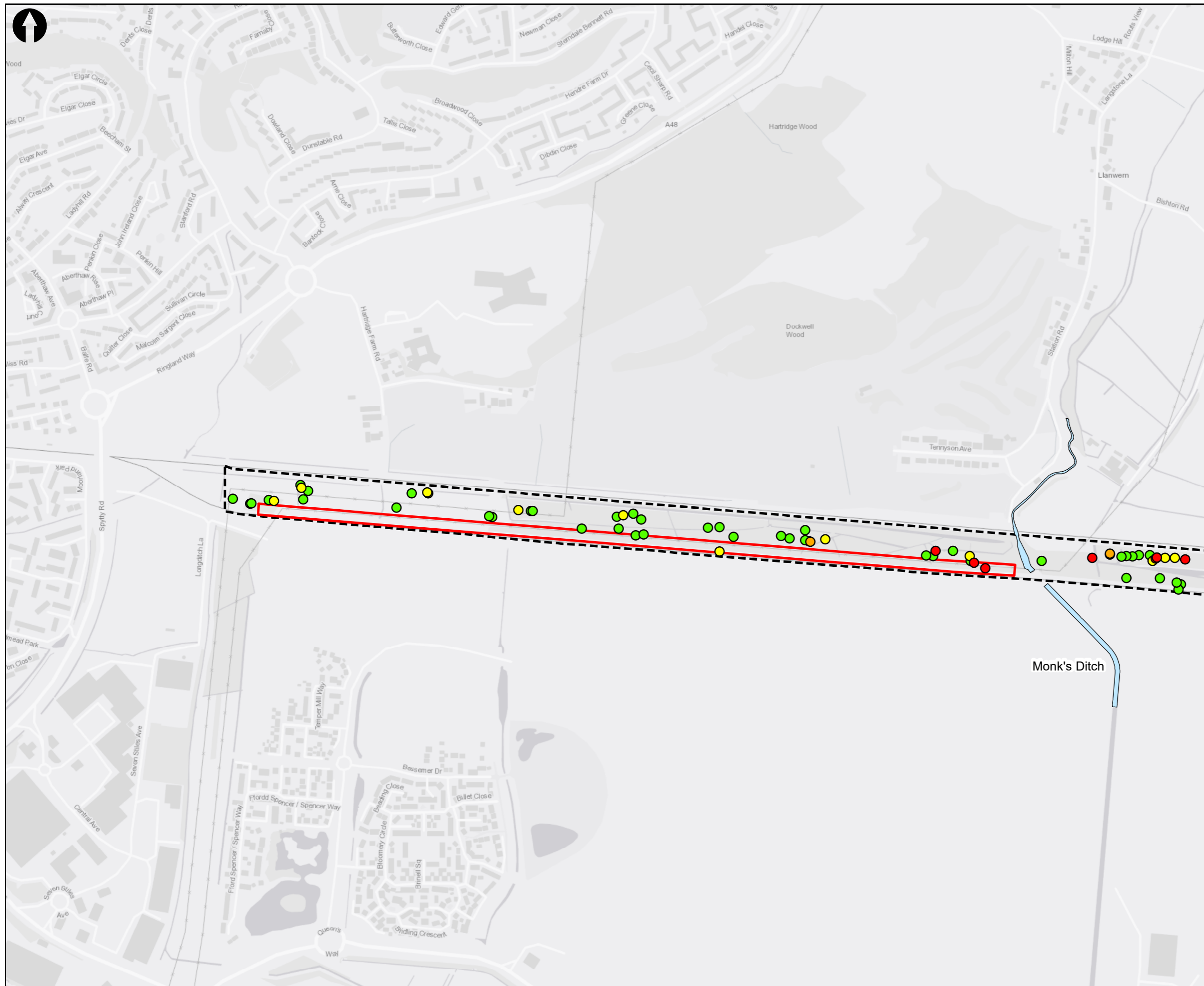
**If you suspect there is a
bird's nest present
within the works area,
STOP ALL INVASIVE
WORKS and contact the
Project Environmental
Representative
IMMEDIATELY.**

**DO NO RISK BREAKING
THE LAW.**





H. Bat Tree Survey Results Plan



Key to Symbols

- Site extent
- Survey area

Waterbody

- Monk's Ditch

Bat potential

- Confirmed roost
- High
- Moderate
- Low

Notes

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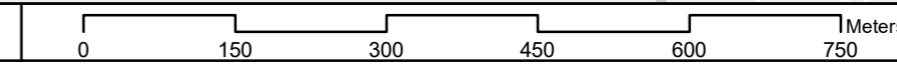
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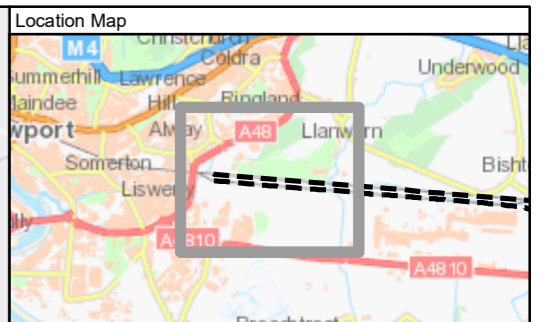
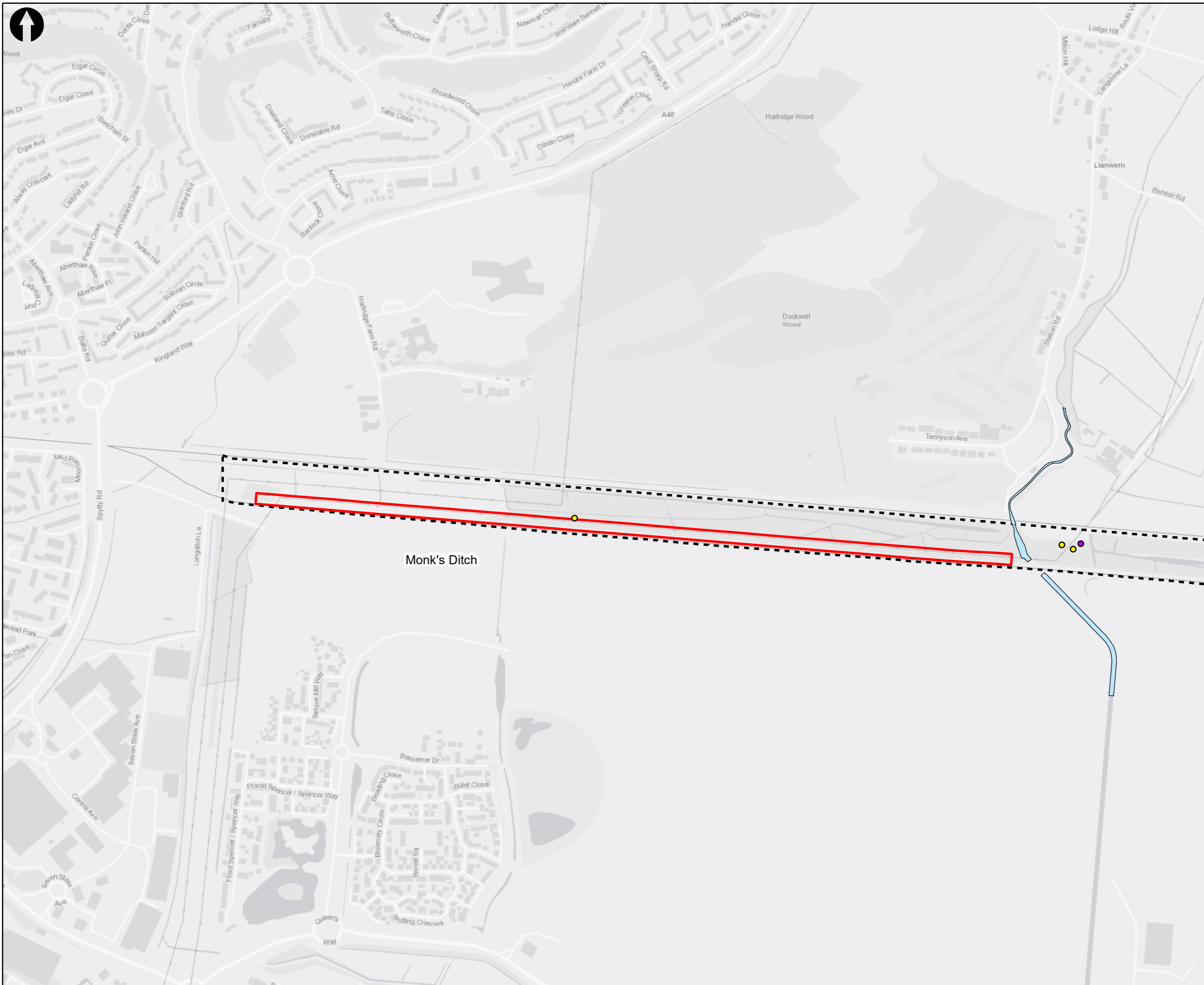
Title

South Wales Metro - Task Order 26
Llanwern Bat Tree Location Plan

Designed	Z Costas	ZCM	Eng Check	Z Costas	ZCM
Drawn	T Ruff	TR	Coordination	L Woolley	LKW
GIS Check	G O'Donovan	GO	Approved	C Probert	CP
Scale at A3	Status	Rev	Security		
1:7,500	INF	P1	STD		



I. Dormouse Nest Location Plan



Key to Symbols

- Site extent
- Survey area
- Confirmed dormouse hibernation nest
- Confirmed dormouse summer nest
- Suspected dormouse summer nest
- Monk's Ditch

Notes

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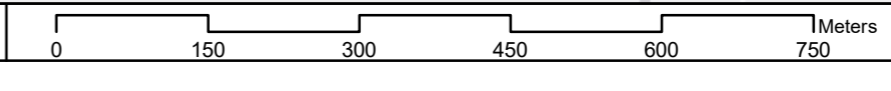
Transport for Wales
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Title

South Wales Metro - Task Order 26
Llanwern Dormouse Nest Location Plan

Designed	Z Costas	ZCM	Eng Check	Z Costas	ZCM
Drawn	T Ruff	TR	Coordination	L Woolley	LKW
GIS Check	G O'Donovan	GO	Approved	C Probert	CP
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Drawing Number
367590-MMD-26-XX-DR-C-0505

J. Otter and Water Vole Method Statement



Llanwern Rail Facilities - Phase 1 Planning

Otter and Water Vole Method Statement

September 2018

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Llanwern Rail Facilities - Phase 1 Planning

Otter and Water Vole Method Statement

September 2018

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	24/09/18	Z Costas-Michael	C Williams	E C Probert	Draft Issue – For TfW Review Only
B	29/09/18	Z Costas-Michael	C Williams	E C Probert	Pre-Application Consultation Issue

Document reference: 367590-WTD-CAR-2662

Information class: Standard

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1 Introduction

1.1 Project Description

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The wider Llanwern Rail Facilities Programme will include an extension of the MESL by circa 2.4km east (to achieve a total length of circa 4km), electrification of the MESL, a new Llanwern railway station and passenger line (including Park & Ride and footbridge), and connections to the South Wales Main Line (Relief Lines). The further phases of the project will be the subject of a subsequent planning application.

- The key parameters for the Scheme are listed below:
- Whole Site area is 3.1 hectares. This land is contained within the red line boundary shown on the Site Location Plan (Drawing number 367590-MMD-48-XX-DR-C-0001); and
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The General Arrangement drawings (Drawing numbers 367590-MMD-48-XX-DR-C-0002 to 367590-MMD-48-XX-DR-C-0005) demonstrate the project scope which includes the design and construction of the following:

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- Drainage and other engineering works.

In order to obtain full planning permission for Phase 1, we have carried out the outline design and technical assessment of the above scope, as well as multiple assessments in terms of ecology, environment, heritage and archaeology.

1.3 Site Location

The proposed rail development Site is located approximately 8 miles east from the centre of Newport, South Wales (Figure 1.1).

The Site is aligned roughly west – east and bordered by the existing South Wales Mainline to the north and the Tata Steelworks to the south. Along the southern boundary of the steelworks site runs the A4810 which links the M4 from junction 23A at Magor with the A48 at Liswerry (a predominantly residential suburb on the south-eastern side of Newport). The Site is more widely bordered by the M4 which runs approximately two and a half miles to the north and the Severn

Estuary which lays approximately three miles to the south. The Gwent Levels to the south is a significant area of wetlands.

The existing South Wales Mainline passes north of the proposed site and provides opportunity for transport links for both passengers and freight.

Figure 1.1: Proposed Location Plan



Source: OS Open Data

1.4 Scope of the Report

This report sets out an ecological method statement for the protection of otters and water voles during the construction works at the site. The objectives of this report are to:

- Detail the assessment of the likely presence of otters and water voles within the site;
- Identify the proposed works which could impact otters and water voles;
- Set out an appropriate protocol to be followed by all contractors to ensure ecology is considered; and
- Provide appropriate site-specific mitigation safeguards and working methodology to protect otters and water voles during all works.

2 Ecology Context

2.1 Otter

Otters are members of the Mustelidae family which also includes badger (*Meles meles*), stoat (*Mustela erminea*) and polecat (*Mustela putorius*). There are thirteen species of otter worldwide although only one, the Eurasian otter (*Lutra lutra*), is native to Britain. Otters suffered a drastic decline in the 1950s primarily due to agricultural use of organochlorine pesticides polluting river systems, which in turn reduced breeding success. Increased traffic has also impacted otter populations with an average of 60% of recorded otter deaths noted as road casualties (Woodroffe, 1994). Reintroduction programmes in the 1980s and 90s were very successful with catchments in Wales now considered to be reaching their carrying capacity for otters (Strachan, 2015).

2.1.1 Habitat Preference and Identification

Otters are semi-aquatic mammals and generally prefer riparian habitat, however, canals, lakes and coastal areas are also used (Parry *et al.* 2011) and they are known to travel overland between catchment areas and along river banks. Otters are solitary and territorial with large home ranges, generally depending on food availability. They require 1.0kg to 1.5kg of food per day, preferring eel (whose flesh is high in fat content and easy to catch), other fish and amphibians. However, they are opportunistic predators and will occasionally take crayfish, water vole, bats and waterfowl.

Otters are a crepuscular species which are most active at dawn and dusk, and so are rarely seen in the day. As such, it is often a search for otter field signs including spraints, anal jelly, footprints, slides, feeding remains and resting sites that establishes the presence of an otter population. Examples of evidence to look out for on site is detailed below:

- Otters (Photo 1) – rarely seen during the day and are often confused with mink. In comparison otters are larger and a lighter brown colour. Otters generally swim lower in the water so that only the ears, face and snout can be seen above the water. Spraints (Photo 2) - blackish colouration, contains visible fish bones and scales and is described as smelling faintly similar to jasmine tea. This is often found on elevated places such as stones, bridges, fallen trees and where watercourses converge);
- Footprints (Photo 3) – 5 toes with gap in front of a long heel;
- Resting sites (Photo 4) - holts, dens and couches; and
- Slides – depressions in vegetation where otters access water from the bank-side.

Photo 1: Eurasian otter



Source: Mott MacDonald Ltd.

Photo 2: Otter spraint



Source: Mott MacDonald Ltd.

Photo 3: Otter footprint



Source: Mott MacDonald Ltd.

Photo 4: Otter holt



Source: Mott MacDonald Ltd.

2.2 Water vole

Water voles are semi-aquatic rodents of the sub family Arvicolinae, along with all other voles, lemmings and muskrats. Their populations in England, Scotland and Wales are at the western edge of their natural range and have declined dramatically over the last century, in particular over the last 30 years. The species has been lost from almost 90% of the sites where it occurred in the last century, as a result of habitat loss and fragmentation, and predation by the introduced mink as this spreads across the UK. The remaining populations are often fragmented, which threatens their long-term survival.

2.2.1 Habitat Preference and Identification

Water voles are generally found in slow-flowing, narrow watercourses about 1.0m in depth which do not fluctuate throughout the year. They are normally found along mud or clay banks, with plenty of bank side emergent vegetation needed for burrowing, feeding and coverage.

Water voles live in colonies, usually stretched out along the watercourse as a series of territories. They live in a system of burrows in waterside banks and utilise only a narrow strip of land along the water's edge (Photo 5). The burrows are dug by the voles biting the earth with its incisors and pushing the soil behind with its feet. The burrows comprise many entrances above and below the water, with interconnecting tunnels, food storage and nesting chambers. Above ground, their activity is largely confined to runs in dense vegetation within two metres of the water's edge. Discrete latrine sites along the runs and water's edge mark territory boundaries (Photo 6).

Water voles do not hibernate, but they do spend long periods within their nest chambers in the winter and there may be little sign of above ground activity. Although predominantly diurnal, males in particular, become more nocturnal in winter.

Photo 5: Water vole burrow



Source: Mott MacDonald Ltd

Photo 6: Water vole latrines



Source: Mott MacDonald Ltd

3 Legislation

3.1.1 Otter

Otters are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017. The Conservation of Habitats and Species Regulations 2017 implements the European Union's 'Habitats Directive' (Council Directive 92/43/EEC (a) on the Conservation of Natural Habitats and of Wild Fauna and Flora) in Great Britain.

The Act and Regulations make it an offence to:

- Intentionally or deliberately kill, injure or take an otter;
- Intentionally or deliberately damage, destroy or obstruct access to any structure or place used for shelter or protection by an otter;
- Intentionally or deliberately disturb an otter while it is occupying a structure or place which it uses for that shelter or protection;
- Deliberately disturb an otter in such a way as to be likely to significantly affect the local distribution or abundance of otters or the ability of any significant group of otters to survive, breed, rear or nurture their young;
- Possess or control (live or dead animal, part or derivative); and
- Sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative).

3.1.2 Water vole

Water vole are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

The Act makes it an offence to:

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

4 Ecological Baseline

4.1 Desktop Survey Results

There are twenty-seven records of otters within 2.0km with the nearest located approximately 0.4km away from the survey area (South East Wales Biodiversity Record Centre, 2017).

Otter surveys were undertaken within the footprint of the M4 Corridor around Newport scheme in 2014 and 2015. Otter presence was noted in Monks' Ditch, immediately south of the site. A single reed to the south-east of the site, approximately 1.5km away also confirmed otter presence (Arup, 2014; RPS, 2015).

4.2 Otter and Water Vole Survey Results

A total of sixty-five waterbodies were surveyed by Mott MacDonald Ltd in 2017 and 2018 for otter.

No evidence of otter was observed during the surveys or using the camera traps. However, Monks' Ditch is a designated SINC for otters. On this basis, whilst it is considered highly unlikely that any holts, couches or other resting places for otter are present on site, it remains possible that otters could make occasional use of the section of Monks' Ditch for foraging or commuting.

A total of sixty-five waterbodies were surveyed in 2017 and 2018 for water vole. No evidence of water vole was observed during the surveys. Potential evidence of water vole was found including burrows, two potential feeding stations and footprints. No other signs which could confirm presence of this species, such as latrines or sightings of water vole, were recorded during the survey work.

According to the Water Vole Mitigation Handbook (Dean *et al.*, 2016) presence of water vole droppings is the only field sign that can be reliably used on its own. However, due to the multiple examples of potential signs found within the site (and within 250.0m of the site), the known population of water voles in the area and the suitability of the habitat to support this species (especially to the north of the site), it is considered appropriate to treat the evidence as indicating likely presence of water voles on a precautionary basis for the purposes of the assessment and recommendations.

5 Proposed Safeguards

The following safeguards are to be followed when undertaking construction works:

5.1 Update Check

Otter and water voles are mobile animals and can move into new territories. As otter have been recorded close to the site and water voles have potentially been recorded on the site, a pre-works walkover should be undertaken approximately 12 weeks prior to any works being undertaken. The walkover will establish if there is any new evidence on site of otter or water vole which may be affected by the works, in order to inform the avoidance and mitigation measures required.

In the unlikely event that an active water vole burrow is recorded during the pre-works walkover within the area to be affected by the works, an ecologist should be contacted to advise on suitable avoidance measures or NRW should be consulted and mitigation will be agreed prior to works commencing on site.

In the unlikely event an active otter holt or couches are identified within the working area, an ecologist should be contacted to advise on avoidance measures or NRW should be consulted to agree whether a licence would be required for disturbance.

5.2 General Construction Safeguards

The following measures are proposed:

- Prior to the start of all works, a tool box talk (Appendix A) will be provided to the contractors by a qualified ecologist. The briefing will raise awareness of the potential use of the site by otters and water vole, their respective legislative protection, and will provide a mechanism for the understanding and reporting of any significant sightings;
- Prior to any works being undertaken, a suitably qualified ecologist will undertake an update check survey as described in Section 5.1;
- Dependant on the results of the update check, the site ecologist may require the use of hand tools only in sensitive areas;
- All works within 30.0m of Monks' Ditch will be supervised by a qualified ecologist;
- There will be a slow start up of equipment to gradually increase levels of noise and vibrations onsite, as sudden noises can be more disturbing;
- Some equipment can be used with hoods, doors or sleeves to reduce noise levels, these should be used wherever possible and particularly at night;
- To avoid entrapment or harm to otters and/or water vole, excavations should be covered when works are not taking place. Where deep excavations are made, a mammal ladder should be installed to allow otters and/or water vole a means of escape from the trench;
- Any temporarily exposed open pipes should be capped to ensure that otters and/or water vole cannot enter them;
- Additional measures should be implemented to negate possible impacts to otters or water voles including standard good practice, such as storage of materials and liquids away from watercourses and prevention measures to avoid accidental spillages etc.;
- Otters are a crepuscular species which are mainly active during dawn and dusk. As such, if night work is essential this should avoid unnecessary disturbance by ensuring that the height

of lighting columns are as low as possible. Lighting hoods, cowls and shields should be utilised to focus light into the working areas and away from the surrounding environment and particularly away from watercourses;

- Where possible, choose the machines and routes for works carefully so as to minimise sediment run-off which might negatively impact upon otter and/ or water vole habitat. The use of temporary culverts may help to avoid sediment entering a watercourse; and
- No watercourses will be blocked and no works are to be undertaken to Monks' Ditch itself.

In addition, no heavy machinery or ground works should be undertaken in the vicinity of other mammal burrows such as fox or rabbit without having implemented control measures to ensure the animals are not present to avoid committing an offence under the Wild Mammals (Protection) Act 1996.

6 References

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Appendices

A. Toolbox Talk

12

A. Toolbox Talk

TOOLBOX TALK: **Otters**

Otters will use a variety of habitats for shelter and protection including under tree roots, boulders or old rabbit burrows. These can be 10's of meters from a watercourse.

Evidence suggests that otters may be present within the vicinity of the proposed work.

LEGISLATION

Under UK law (*Wildlife and Countryside Act 1981 and Conservation of Habitats and Species Regulations 2017*) it is an offence to:

- Intentionally kill, take or injure an otter;
- Possess or control an otter;
- Intentionally or recklessly cause damage, destruction or obstruct access to any structure or place used by an otter for shelter or protection;
- Intentionally or recklessly disturb an otter.

Penalties for breaking the law can include **large fines**, **imprisonment** and the **seizure of equipment**.

WHAT TO DO IF YOU SEE AN OTTER

If at any time during the works an otter is seen, all works should stop (when safe to do so) and the Ecologist must be contacted immediately. If there is any doubt contact them.

When calling, leaving a message is insufficient - you must speak directly to an ecologist. They will then be able to advise on a legal and appropriate course of action.



If there is any suspicion that otters are present within the works area, STOP ALL WORKS and contact your Project Environmental Representative IMMEDIATELY on:

DO NOT RISK BREAKING THE LAW

TOOLBOX TALK: Water Vole

The water vole is sometimes confused with a rat but are generally smaller, with a blunter nose, rounder body and less obvious short round ears. Water voles are found in slow moving rivers streams ditches and around lakes, reed-beds, marshes and ponds.

Water voles can establish their burrows several meters from a water course and can be easily confused with rat burrows.

Evidence suggests that water voles may be present within the vicinity of the proposed works.

LEGISLATION

Under UK law (Wildlife and Countryside Act, 1981) it is an offence to:

- intentionally or recklessly cause damage, destruction or obscure access to any structure or place used by a water vole for shelter or protection;
- intentionally or recklessly disturb a water vole while occupying such a place; or,
- intentionally kill or injure a water vole.

Penalties for breaking the law can include **large fines**, **imprisonment** and the **seizure of equipment**.

If at any time during the works a water vole or possible water vole burrow is seen, all works likely to cause damage or destruction to a burrow must stop and the Ecologist must be contacted immediately.

Call _____. Leaving a message is insufficient - you must speak directly to an Ecologist. The Ecologist will then be able to advise on a legal and appropriate course of action.

Examples of Water Vole Burrows



If there is any suspicion that water voles are present within the works area, STOP ALL WORKS and contact the site Ecologist IMMEDIATELY on:

**DO NOT RISK
BREAKING THE LAW.**

K. Badger Method Statement



Llanwern Rail Facilities - Phase 1 Planning

Badger Method Statement

September 2018

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Llanwern Rail Facilities - Phase 1 Planning

Badger Method Statement

September 2018

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	24/09/18	Z Costas-Michael	C Williams	E C Probert	Draft Issue – For TfW Review Only
B	28/09/18	Z Costas-Michael	C Williams	E C Probert	Pre-Application Consultation Issue

Document reference: 367590-WTD-CAR-2661

Information class: Standard

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1 Introduction

1.1 Project Description

Mott MacDonald (MM) has been commissioned by Transport for Wales (TfW), on behalf of Welsh Government, to prepare and submit a planning application, seeking full planning permission for the design and construction of a 1.6km long Major Events Stabling Line (MESL) on land adjacent to the existing Tata Steelworks Service Lines in Llanwern, South Wales. This is Phase 1 of the Llanwern Rail Facilities Programme.

The MESL will be used for stabling of rolling stock for major events in the area, to enable flexibility for future train requirements, and proving of trains prior to use on the rail network. The MESL will be electrified in a future phase of work. This proposed 1.6km length of MESL to the west of Monks' Ditch was formerly known as Option 6a.

The wider Llanwern Rail Facilities Programme will include an extension of the MESL by circa 2.4km east (to achieve a total length of circa 4km), electrification of the MESL, a new Llanwern railway station and passenger line (including Park & Ride and footbridge), and connections to the South Wales Main Line (Relief Lines). The further phases of the project will be the subject of a subsequent planning application.

- The key parameters for the Scheme are listed below:
- Whole Site area is 3.1 hectares. This land is contained within the red line boundary shown on the Site Location Plan (Drawing number 367590-MMD-48-XX-DR-C-0001); and
- The Site length is approximately 1.6km long and 19m wide.

1.2 Scope of Works

The General Arrangement drawings (Drawing numbers 367590-MMD-48-XX-DR-C-0002 to 367590-MMD-48-XX-DR-C-0005) demonstrate the project scope which includes the design and construction of the following:

- A single track stabling line (MESL) circa 1.6km long;
- Associated earthworks and landscaping; and
- Drainage and other engineering works.

In order to obtain full planning permission for Phase 1, we have carried out the outline design and technical assessment of the above scope, as well as multiple assessments in terms of ecology, environment, heritage and archaeology.

1.3 Site Location

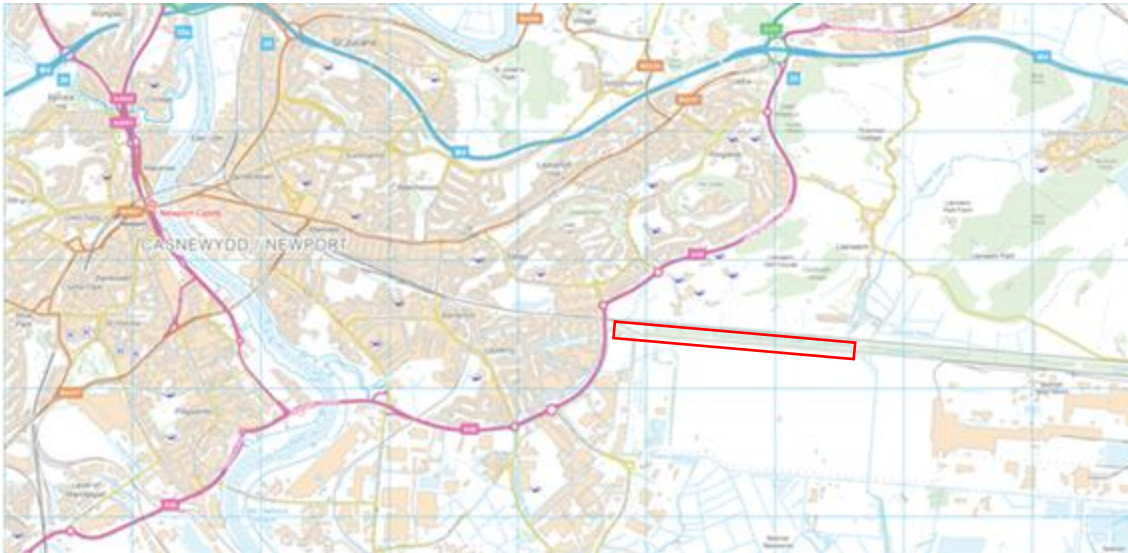
The proposed rail development Site is located approximately 8 miles east from the centre of Newport, South Wales (Figure 1.1).

The Site is aligned roughly west – east and bordered by the existing South Wales Mainline to the north and the Tata Steelworks to the south. Along the southern boundary of the steelworks site runs the A4810 which links the M4 from junction 23A at Magor with the A48 at Liswerry (a predominantly residential suburb on the south-eastern side of Newport). The Site is more widely bordered by the M4 which runs approximately two and a half miles to the north and the Severn

Estuary which lays approximately three miles to the south. The Gwent Levels to the south is a significant area of wetlands.

The existing South Wales Mainline passes north of the proposed site and provides opportunity for transport links for both passengers and freight.

Figure 1.1: Proposed Location Plan



Source: OS Open Data

1.4 Scope of the Report

This report sets out an ecological method statement for the protection of badgers during the construction at the site. The objectives of this report are to:

- Detail the assessment of the likely presence of badgers within the site;
- Identify the proposed works which could impact badgers;
- Set out an appropriate protocol to be followed by all contractors to ensure ecology is considered; and
- Provide appropriate site-specific mitigation safeguards and working methodology to protect badgers during all works.

2 Ecology Context

The Eurasian badger, a member of the family Mustelidae, is widely distributed throughout the United Kingdom. Habitat has become more fragmented over time for badgers, which are moving into any suitable habitat available and adapting to urban environments.

2.1 Identification

Badgers can grow up to one metre in length, they are short and stocky with loosely fitting skin. Their fur is black and white, with the appearance of a grey colour on the body. Their heads are white with two iconic black stripes from their snouts along their eyes and to their ears (Photo 1).

Photo 1: Badger in the daylight



Source: Mott MacDonald Ltd

They have powerful, muscular necks and forelegs, as well as strong claws which help in digging their burrows known as setts. They live in family and social groups known as clans¹, and have territories demarcated by latrines and through scent marking.

2.2 Setts

A sett is described as any structure or place that shows signs that indicate it is currently being used by badgers. This means any tunnels or chambers and the areas immediately surrounding the entranceways are all part of the sett. Other structures badgers may use for shelter include spaces among rocks and boulders; under garden sheds; under raised buildings; among hay bales; and under hedges.

Each clan holds a main sett which is continuously occupied and used for breeding. The main nesting chamber within the sett is usually 5.0m to 10.0m from the tunnel entrance and 3.0m below the surface.

¹ Clans can range from 2 – 20 adult badgers (though 6 is more usual)

In addition to the main sett, clans may have a number of other setts with different uses including:

- Annex setts – usually less than 150.0m from the main sett and generally connected by well-worn paths;
- Subsidiary setts – over 150.0m from the main sett, it is unlikely to be in constant use; and
- Outlier setts – these are usually one or two entrance holes that are used sporadically.

Where badger setts are discovered, their activity level can be assessed and classified as below:

- Active setts – generally large spoil heaps found outside, recently excavated, with well-worn paths present between entrances and leading away into the surrounding habitat, the area is generally clear of vegetation;
- Partially / seasonally active setts – generally only one or two entrance holes with spoil heaps outside, fresh spoil may not have been added recently. The sett is not in constant use, however it may have been used earlier in the season or during the previous season. Generally, the area is clear of vegetation, though a small amount of leaf litter / debris may have collected in the entrance ways. Paths leading to the entranceways are less well-worn and cobwebs may be present across the entrances (indicating that it has not been used recently). This sett will not be part of the main sett; and
- Disused setts – these are setts that have not been used for at least one season. Generally, they have large amounts of leaf litter / debris collected in the entranceway and vegetation is likely to have grown up around it. There will be no obvious paths leading to and from the entrances and is likely to have weathered and become vegetated.

3 Legislation

Badgers are protected in the UK under the Protection of Badgers Act 1992, which makes it an offence to:

- Wilfully capture, kill or injure (or attempt to capture, kill or injure) a badger;
- Intentionally or recklessly damage, destroy or block access to their setts; and
- Disturb badgers in setts.

Penalties for breaking the law can include large fines, imprisonment and the seizure of equipment.

Some burrows and disused badger setts found along railway embankments such as those within the site may be linked to foxes and rabbits. These, along with all wild species of mammal are protected under the Wild Mammals (Protection) Act 1996. Whereby it is an offence to:

- Mutilate, kick, beat, nail, or otherwise impale, stab, burn, stone, crush, drown, drag or asphyxiate any wild mammal with the intent to inflict unnecessary suffering.

4 Ecological Baseline

4.1 Desktop Survey Results

One record of a badger sett was returned from the data search. The record is 1.9km away from the survey area and was submitted in 2013 (SEWBRc, 2017).

During 2014, protected species surveys were undertaken to inform the M4 Corridor proposal. Two main setts were recorded within Tata Steel land during these walkovers, with a further annex sett identified close to one of the main setts. During the 2015 surveys, only one of the main setts was observed, this appeared to be disused and was recorded to have debris present, the other two setts were not observed due to dense scrub and reedbed (Welsh Government, 2016).

4.2 Badger Survey Results

During surveys in 2017, a confirmed disused outlier sett was observed within the survey area. A second disused, collapsed outlier sett was also observed, along with signs of foraging and badger dung. No evidence of recently active badgers was recorded during this survey.

Additional badger evidence was observed during spring and summer 2018 which comprised two latrines, a disused outlier sett and an active subsidiary sett. Camera trapping surveys also recorded badgers in six locations across the survey area.

Badgers may use the linear features of the railway line as pathways and territorial boundaries, this would account for the lack of badger paths observed through the woodland. Due to the time of year the initial badger survey was undertaken, it is possible that badgers were less active and therefore would not be actively occupying their territorial extent. During 2018, badgers were recorded using the survey area.

Based on the evidence recorded on survey, badgers are using the site to forage and also for sett creation. Badger setts cannot be ruled out within inaccessible locations of dense scrub. The active sett is located approximately 1.5km away from the site boundary.

5 Proposed Safeguards

5.1 Update Check

As badgers can leave existing setts and establish new setts very quickly, the following recommendations should be applied to prevent any impacts on badger:

- An update check is recommended 12 weeks prior to the commencement of works on site;
- The walkover will establish if there is evidence on site that the setts recorded are currently active or inactive as well as to ascertain if any new setts have been created which would affect the proposed works; and
- If evidence of an active badger sett, which is considered to be affected by any works (such as excavation or vegetation clearance within 20.0m or pile driving within 100.0m), is recorded during the pre-works walkover, then Natural Resources Wales (NRW) should be contacted to see if a licence will be required.

5.2 General Construction Safeguards

Badgers can become stressed easily, particularly sows (females) during the pregnancy and rearing periods. Any works in the form of vegetation clearance, digging, pile driving and other high-level noise and vibration works may cause disturbance to badgers in their setts. The following measures are recommended for initial vegetation clearance works within the site:

- Toolbox talks are recommended to be given to all site staff, by a qualified ecologist, prior to any works being undertaken (Appendix A);
- Where vegetation clearance is required, a suitably qualified ecologist should supervise works;
- Where excavation is required, it should be kept a minimum of 20.0m from any sett as tunnels of setts may extend up to 20.0m. Excavation works and use of heavy machinery could result in damage and possible collapse of a sett;
- Any excavation should be fenced off and / or covered to avoid animals becoming trapped. A mammal ladder should be placed in any excavation left open to allow any animals that may become trapped to escape;
 - All excavations should be checked each morning to ensure no badgers or other animals have become trapped overnight; and
 - If a badger is found within an excavation, then a qualified ecologist should be contacted immediately for advice.
- Soil storage – consideration should be given to where spoil is stored, if likely to be stored for a long period of time then badger proof fencing should be considered;
- Where works cannot be restricted to daylight hours and where lighting is required, hoods should be used and lights directed at works and away from any setts;
- Chemicals, including fuel for equipment and machinery, should not be used within 20.0m of any sett. Chemicals should be stored following best practice guidelines; and
- No equipment should be stored within suitable badger habitat.

If badgers and / or their setts are found to be present within the work area at any time during the works, it will be necessary for all activity to cease until further advice is sought from the qualified

ecologist. Appropriate action can then be taken. NRW may be contacted depending on the circumstances.

6 References

Mott MacDonald (2018) TO026 Llanwern Station – Badger Survey Report (Report Reference: 367590-WTD-CAR-2624)

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Appendices

A. Toolbox Talk

11

A. Toolbox Talk

TOOLBOX TALK: **Badgers**

Badgers live in underground setts made up of tunnels and chambers visible as single, or groups, of holes. These holes are at least 25 cm wide and 20 cm high. (An entrance to a sett is illustrated overleaf). Badgers are nocturnal animals so you are unlikely to see them during the day.

Evidence suggests that badgers may be present within the vicinity of the proposed work. Even if a badger sett has not been discovered onsite, there is potential for badgers to establish a sett during the works and/or for a sett to already be present but undetected under dense scrub or vegetation.



LEGISLATION

Under UK law (*Protection of Badgers Act 1992*), it is an offence to wilfully kill, injure, take or possess a badger, or attempt to do so, and to intentionally or recklessly damage, destroy or obstruct access to a badger sett, or to disturb a badger while it is occupying a sett. Penalties for breaking the law can include **large fines**, **imprisonment** and the **seizure of equipment**.

Disturbance of a badger occupying a sett (potentially via noise or vibration) can lead to prosecution.

WHAT TO DO IF YOU FIND A BADGER SETT

If at any time during the works a potential badger sett is discovered within 30m of the proposed works, all works should halt (when safe to do so) and the Ecologist or Environment Team must be contacted immediately. If there is any doubt contact the Ecologist or Environment Team.

Call _____ and ask for an Ecologist. Leaving a message is insufficient - you must speak directly to the Ecologist or a member of the environment Team. They will then be able to advise on legal and most appropriate course of action.

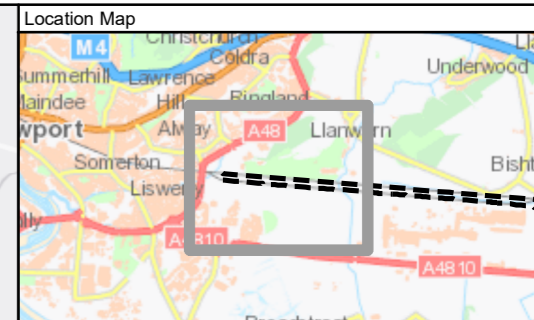
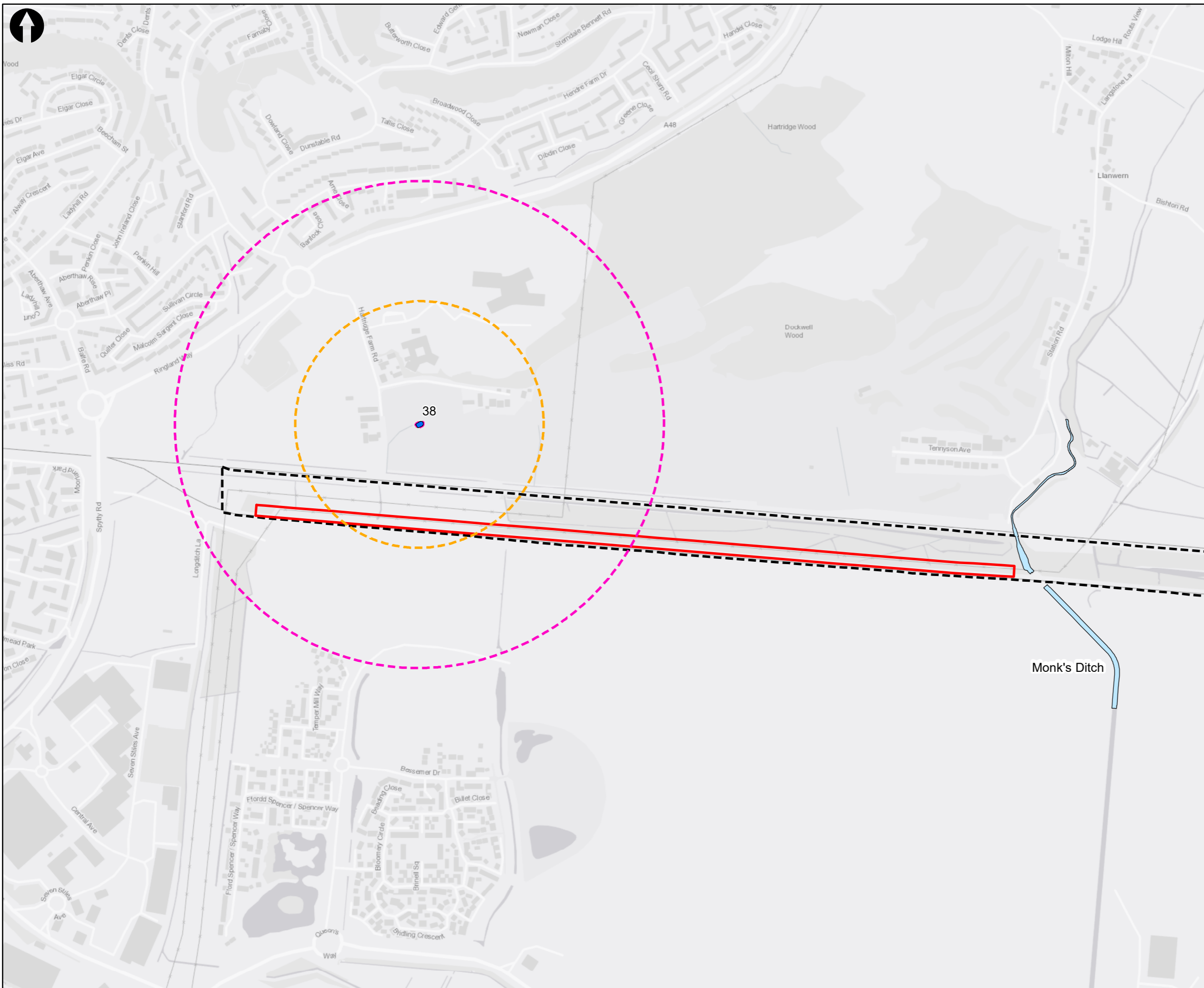
If there is any suspicion that badgers are present within 30m of the site, STOP ALL WORKS and contact the site Ecologist IMMEDIATELY on

DO NOT RISK BREAKING THE LAW

Badger Sett Entrances



L. Great Crested Newt Pond Location Plan



Key to Symbols

- Site extent
- Survey area
- Waterbody**
- Monk's Ditch
- 38 Known breeding pond & pond number
- Buffer zones**
- 250m buffer
- 500m buffer

Notes

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Rev	Date	Drawn	Description	ZCM	CP
P1	28/09/18	TR	For information	ZCM	CP

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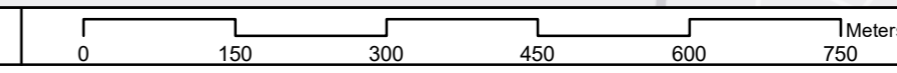
Transport for Wales
 Southgate House
 Wood Street
 Cardiff, CF10 1EW
 United Kingdom

Title

South Wales Metro - Task Order 26
 Llanwern Great Crested Newt Pond
 Location Plan

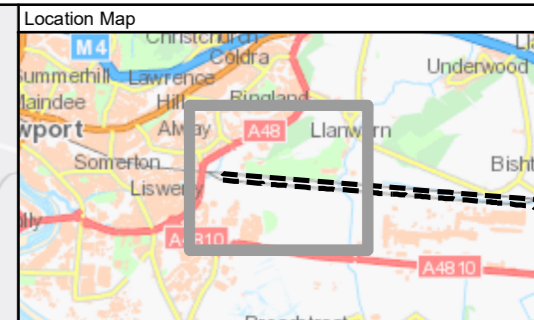
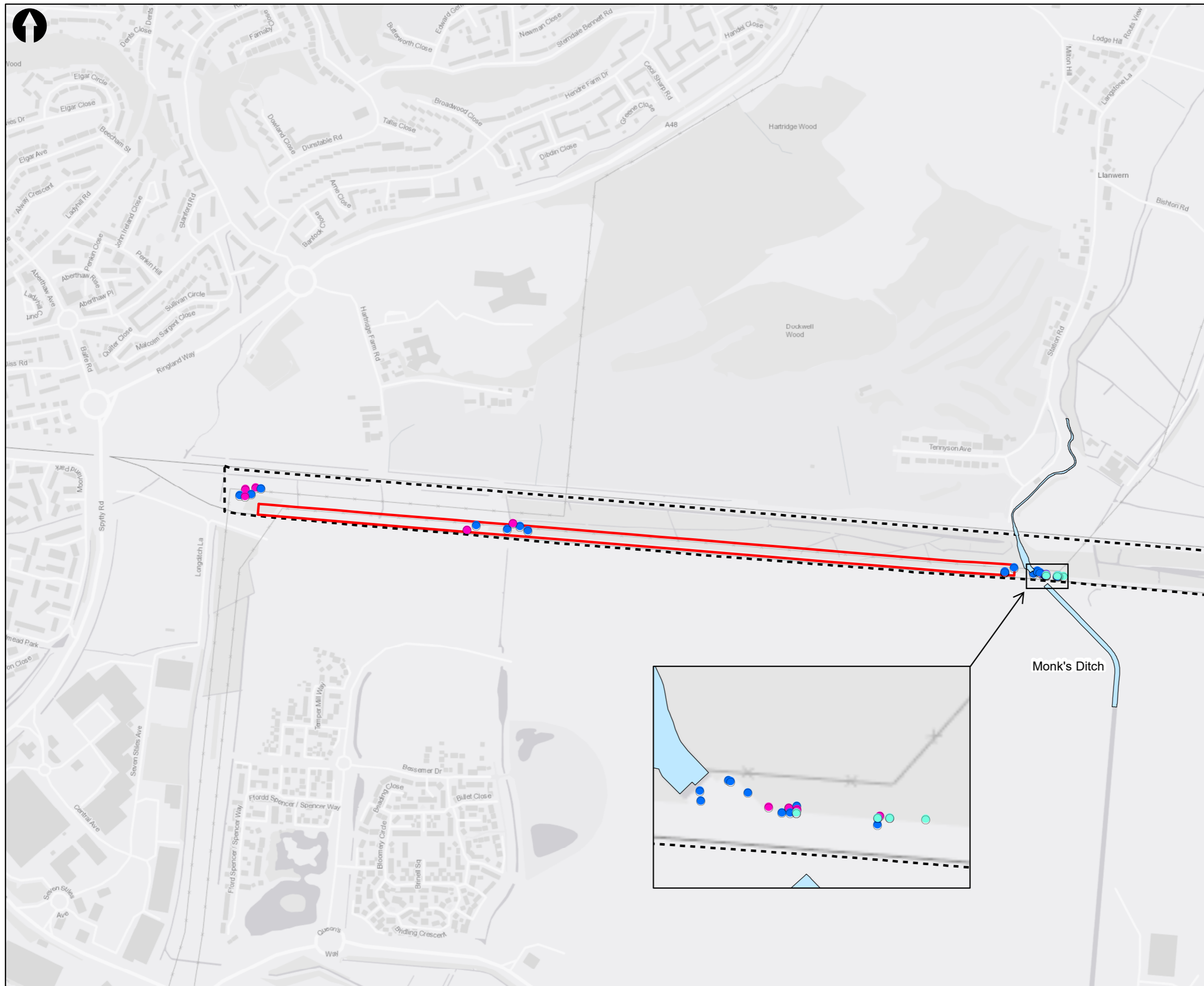
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Drawn	T Ruff	TR	Coordination	L Woolley	LKW
GIS Check	G O'Donovan	GO	Approved	C Probert	CP
Scale at A3	Status	Rev	Security		
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Drawing Number
367590-MMD-26-XX-DR-C-0508

M. Reptile Location Plan



Key to Symbols

- Site extent
- Survey area
- Monk's Ditch
- Adult slow-worm
- Juvenile slow-worm
- Adult grass snake
- Juvenile grass snake

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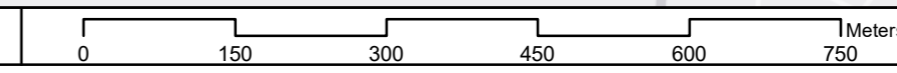
Transport for Wales
Southgate House
Wood Street
Cardiff, CF10 1EW
United Kingdom

Title

South Wales Metro - Task Order 26
Llanwern Reptile Location Plan

Designed	Z Costas	ZCM	Eng Check	Z Costas	ZCM
Drawn	T Ruff	TR	Coordination	L Woolley	LKW
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Drawing Number
367590-MMD-26-XX-DR-C-0506

N. Reptile Method Statement



Llanwern Rail Facilities - Phase 1 Planning

Reptile Method Statement

September 2018

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Llanwern Rail Facilities - Phase 1 Planning

Reptile Method Statement

September 2018

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	24/09/18	Z Costas-Michal	C Williams	E C Probert	Draft Issue - for TFW only
B	28/09/18	Z Costas-Michal	C Williams	E C Probert	Pre-Application Consultation Issue

Document reference: 367590-WTD-CAR-2663

Information class: Standard

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1 Introduction

1.1 Project Description

Mott MacDonald (MM) has been commissioned by Transport for Wales (TfW), on behalf of Welsh Government, to prepare and submit a planning application, seeking full planning permission for the design and construction of a 1.6km long Major Events Stabling Line (MESL) on land adjacent to the existing Tata Steelworks Service Lines in Llanwern, South Wales. This is Phase 1 of the Llanwern Rail Facilities Programme.

The MESL will be used for stabling of rolling stock for major events in the area, to enable flexibility for future train requirements, and proving of trains prior to use on the rail network. The MESL will be electrified in a future phase of work. This proposed 1.6km length of MESL to the west of Monks' Ditch was formerly known as Option 6a.

The wider Llanwern Rail Facilities Programme will include an extension of the MESL by circa 2.4km east (to achieve a total length of circa 4km), electrification of the MESL, a new Llanwern railway station and passenger line (including Park & Ride and footbridge), and connections to the South Wales Main Line (Relief Lines). The further phases of the project will be the subject of a subsequent planning application.

- The key parameters for the Scheme are listed below:
- Whole Site area is 3.1 hectares. This land is contained within the red line boundary shown on the Site Location Plan (Drawing number 367590-MMD-48-XX-DR-C-0001); and
- The Site length is approximately 1.6km long and 19m wide.

1.2 Scope of Works

The General Arrangement drawings (Drawing numbers 367590-MMD-48-XX-DR-C-0002 to 367590-MMD-48-XX-DR-C-0005) demonstrate the project scope which includes the design and construction of the following:

- A single track stabling line (MESL) circa 1.6km long;
- Associated earthworks and landscaping; and
- Drainage and other engineering works.

In order to obtain full planning permission for Phase 1, we have carried out the outline design and technical assessment of the above scope, as well as multiple assessments in terms of ecology, environment, heritage and archaeology.

1.3 Site Location

The proposed rail development Site is located approximately 8 miles east from the centre of Newport, South Wales (Figure 1.1).

The Site is aligned roughly west – east and bordered by the existing South Wales Mainline to the north and the Tata Steelworks to the south. Along the southern boundary of the steelworks site runs the A4810 which links the M4 from junction 23A at Magor with the A48 at Liswerry (a predominantly residential suburb on the south-eastern side of Newport). The Site is more widely bordered by the M4 which runs approximately two and a half miles to the north and the Severn

Estuary which lays approximately three miles to the south. The Gwent Levels to the south is a significant area of wetlands.

The existing South Wales Mainline passes north of the proposed site and provides opportunity for transport links for both passengers and freight.

Figure 1.1: Proposed Location Plan



Source: OS Open Data

1.4 Scope of the Report

This report sets out an ecological method statement for the protection of reptiles during the construction works at the site. The objectives of this report are to:

- Detail the assessment of the likely presence of reptiles within the site;
- Identify the proposed works which could impact reptiles;
- Set out an appropriate protocol to be followed by all contractors to ensure ecology is considered; and
- Provide appropriate site-specific mitigation safeguards and working methodology to protect reptiles during all works.

2 Ecology Context

2.1 Ecology Context

Generally, reptiles are active during the day from March to early October. They hibernate through the winter season from October to March, and mating takes place between April and July with young born between June and October (Edgar *et al.*, 2010). Reptiles are ectothermic which means they rely on the external environment to maintain their body temperatures. As such, they have variable body temperatures and it influences many aspects of reptilian biology, including habitat requirements (Edgar *et al.*, 2010). They are usually active when temperatures are above 10°C, when there is no precipitation and if the wind strength is negligible to moderate. They will usually move into colder microclimates if temperatures exceed 20°C and will find shelter if there is precipitation and/or if the wind strength is too high (Froglife, 1999).

All six species of British reptile have been identified as being of conservation concern due to the decline in the amount of suitable habitat. Identification of the four common British reptiles, their habitat requirements and activity details including their dispersal distances are detailed below. Within the site, slow-worms and grass snakes are known to be present.

Sand lizards and smooth snakes have been discounted due to lack of suitable habitat within the location and distance from known populations (Edgar *et al.*, 2010) and are no longer considered in this method statement.

2.2 Identification

2.2.1 Slow-worms (*Anguis fragilis*)

Slow worms are actually lizards, but have a snake-like appearance, as they have no legs and are clad in smooth shiny scales (Photo 1) and typically grow up to 400mm in length. Males are various shades of grey or brown with occasional blue spots. Females are brown or copper in colour with dark brown flanks and a dark vertebral stripe. Young slow-worms are light silver or gold in colour with darker more defined flanks and vertebral stripe. They can be found on heathland, lower altitude moorland, most types of grassland (especially chalk grassland and rough grassland with bramble scrub), woodland glades and rides, hedgerows and disused quarries (Edgar *et al.*, 2010). They can also be found on embankments including railway, road and canal (Edgar *et al.*, 2010). They are mainly diurnal but can forage after dark on warm evenings. They primarily live underground, underneath objects, within vegetation litter and grassland tussocks. They do not move long distances and territories are likely to only extend to several hundred square metres. They hibernate in communities and often undertake annual migration movements, but the distances are smaller compared to snake migration distances (Edgar *et al.*, 2010).

2.2.2 Grass Snakes (*Natrix natrix*)

Adult grass snakes are usually between 700mm and 1,000mm long. Olive green, brown or grey body, with black bars down the sides. Usually has a yellow or white “collar” behind the head (Photo 2). Often associated with wetlands, but can also be found in heathland, grasslands, open woodlands, farmland, gardens and allotments. Can also be found on brownfield sites including railway corridors, disused quarries, along road and canal corridors. Are often not reliant on a single site providing the necessary habitat for hibernation, feeding and egg-laying. Warm, humid, decomposing organic material is required for egg-laying. Largely diurnal although they

are known to be active at night during warm periods, especially in and around ponds. Individuals disperse from hibernation sites relatively rapidly and may move over several kilometres during the active season. May migrate through relatively poor-quality habitat to reach favoured egg-laying, foraging or hibernation areas (Edgar *et al.*, 2010).

Photo 1: Slow-worm



Source: Mott MacDonald Ltd

Photo 2: Grass snake



Source: Mott MacDonald Ltd

2.2.3 Common Lizards (*Zootoca vivipara*)

Common lizards typically grow up to 130mm long and are various shades of brown with small bars or spots (Photo 3). Young lizards are black or dark copper in colour. They can be found in a range of different habitats, including grassland, woodland edges, brownfield sites, heaths and dunes (English Nature, 2004). Often seen on linear features including railway embankments and stone walls (English Nature, 2004). They are diurnal and travel only up to a few tens of metres as lizards often share the same basking areas and hiding places. Most dispersal is through the movements of juveniles, with rapid colonisation of new habitat (Edgar *et al.*, 2010).

2.2.4 Adders (*Vipera berus*)

Adders can grow up to 550mm long and are usually grey, rust or sandy-coloured, with a dark coloured zig-zag stripe all the way along their body (Photo 4). Found on heaths, moors, meadows, woodland glades and urban fringe sites. Mainly a diurnal species but may also be active at night during very hot weather. They often use separate spring breeding and summer foraging areas as they prefer wetter habitats for the summer, which can be up-to two kilometres apart. They return to traditional hibernation sites in late summer which are often where the females give birth (Edgar *et al.*, 2010).

Photo 3: Common lizard



Source: Mott MacDonald Ltd.

Photo 4: Adders



Source: Mott MacDonald Ltd

3 Legislation

3.1 Legislation

Under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), only parts of sub-section 9(1) and all of sub-section 9(5) apply to the more common species slow worm, common lizard, adder and grass snake and make it illegal to:

- Deliberately or intentionally kill, capture or injure; and
- Sell, barter, exchange, transporting for sale or advertising to sell or to buy them.

Section 9 of the Act states that activities which could result in the death or injury of the more common species are not licensable and rely on the defence that any such outcome is the incidental result of a lawful operation and could not reasonably have been avoided.

4 Ecological Baseline

4.1 Desktop Survey Results

Two records of reptiles were identified within 2.0km of the survey area (South East Wales Biodiversity Records Centre). These included; one record of two individual grass snakes submitted in 2016 approximately 1.2km away from site and one record of a common lizard approximately 1.7km away from the survey area.

A review of the M4 Corridor around Newport data has identified the presence of both adult and juvenile grass snakes to the south of the survey area.

4.2 Reptile Survey Results

Presence/likely absence surveys confirmed that slow-worms and grass snakes are using the survey area. A peak count of 2 adult grass snakes were recorded along with 10 adult slow-worms. Grass snakes were therefore originally assigned as having a 'low population class' and slow-worms as a 'good population class' according to Froglife (1999) Advice Sheet 10. It is considered that slow-worm and grass snake populations within the site are breeding as sub-adults and juveniles were recorded.

According to the Guidelines for the Selection of Wildlife Sites in South Wales (Gwent Wildlife Trust, 2004), any site supporting a good population of any reptile species should be considered for selection. This guidance also states that recording several individuals of a species on half or more of the survey occasions should be taken to indicate the presence of a 'good' population. Recording of several individuals on every survey occasion (or nearly every occasion) may be indicative of an exceptional population. As life stage (e.g. adult or juvenile) is not accounted for in this guidance, following a precautionary approach, the population estimate for grass snake may be elevated to 'good'.

5 Proposed Safeguards

5.1 Proposed Safeguards

5.1.1 Prior to Works

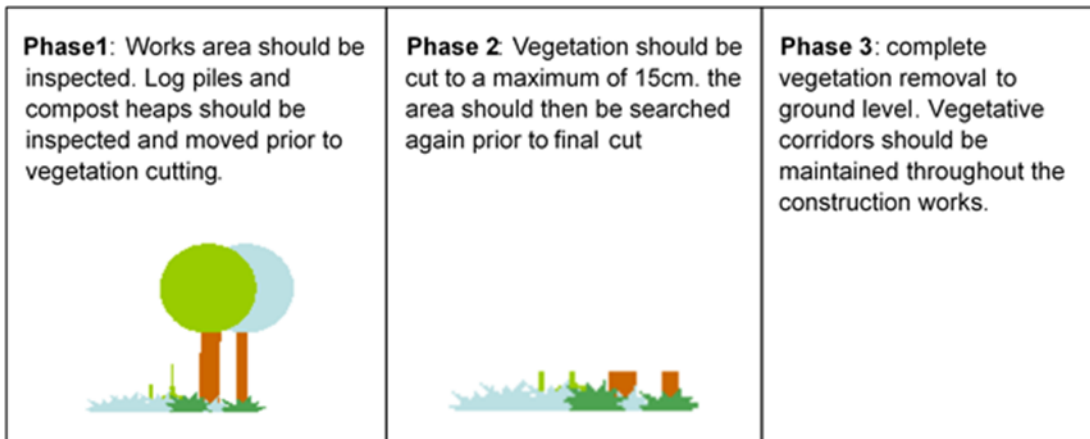
Prior to the start of all works, a tool box talk (Appendix A) will be provided to the contractors by a qualified ecologist. The briefing will raise awareness of the potential use of the site by reptiles, their legislative protection, and will provide a mechanism for the understanding and reporting of any significant sightings.

5.1.2 Sensitive Vegetation Clearance Methodology

Vegetation clearance should be undertaken between April and the end of October, whilst reptiles are active, following the below sensitive vegetation clearance methodology:

- An ecologist will be present on site during the vegetation clearance works;
- All areas to be affected will be finger-tip searched by the ecologist;
- No clearance works are to occur until areas have been confirmed clear of any reptiles;
- After any areas of suitable terrestrial habitat are searched, if vegetation is longer than 150mm then the vegetation will be reduced in height using hand held tools on a two-stage cut basis (Figure 2).
 - Areas to be affected by the proposed works will be cut to 150mm initially, hand searched by the on-site ecologist; and
 - Then cut to ground level.

Figure 2: Visual Interpretation of Vegetation Clearance Methodology



Source: Mott MacDonald Ltd.

- If any reptiles are found during the works they should be removed by hand to areas away from the working area, such as scrub or retained tall ruderal habitat that will not be affected by the works;
- All arisings from cut vegetation are to be removed using a rake or blower outside of the works area; and

- Should cleared vegetation start to regrow before the proposed works are undertaken, then this will need to be maintained at ground level. Any further vegetation clearance required will be undertaken in line with the above detailed methodology.

5.1.3 Sensitive Hibernacula/ Refugia Clearance Methodology

- Where areas of potential refugia/ hibernacula are identified (including but not limited to log piles) and *cannot be avoided*, these will be dismantled by hand by the on-site ecologist; and
- The on-site ecologist will advise on a suitable area for which the hibernacula/ refugia can be re-instated or hibernacula will be moved outside the works area.

5.1.4 Sensitive Ground Clearance Methodology

- Once any vegetation and refugia have been sensitively cleared, the topsoil should be stripped during suitable weather conditions. This should be performed by careful use of an excavator with a toothed bucket under the supervision of a licensed ecologist; and
- Once it has been deemed clear of reptiles, the ground should be compacted down to render it unsuitable for reptiles to use as a refuge or resting place.

5.1.5 Good Practice Procedures

- No equipment will be stored in suitable reptile habitat as identified by the site ecologist. This will reduce the risk of stored equipment being used as refugia by reptiles. Should this be required it is recommended that these are situated within the designated work compound;
- All stored stone and subsoil materials that need to be stored overnight will be compacted down to render it unsuitable for reptiles to use as a refuge or resting place;
- Any excavations should be covered over on the same day wherever possible; and
- As a preventive measure for any excavations, suitable mammal ladders will be left overnight to aid the dispersal of amphibians, reptiles and mammals. In the morning visual checks of these areas will be undertaken for the presence of any reptiles, amphibians or mammals. If any animal is found, the on-site ecologist will be contacted.

6 References

Edgar, P., Foster, J. and Baker, J. (2010). Reptile Habitat Management Handbook. Amphibian and Reptile Conservation, Bournemouth.

English Nature (2004). Reptiles: guidelines for developers.

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

South East Wales Biodiversity Records Centre (SEWBReC) (2017) *Biodiversity Information Search: Llanwern*

Appendices

A. Toolbox Talk

12

A. Toolbox Talk

TOOLBOX TALK: COMMON REPTILES

Britain supports 4 species of common reptile which are found throughout a number of habitat types sometimes in large numbers within grassland, scrub and woodland. Evidence suggests that there is potential for common species of reptile to be present within the site of proposed works.

LEGISLATION

All native reptiles in Britain are protected under UK law (*Wildlife and Countryside Act 1981*).

This protection makes it **illegal to intentionally kill or injure any native species of common reptile.**

As there is potential for reptiles to be within the site of proposed works, causing injury and or death to any reptile onsite could be identified as intentional by a UK court.

Penalties for breaking the law can include **large fines, imprisonment and the seizure of equipment.**

WHAT TO DO IF YOU SEE A REPTILE

If a reptile is seen, any works likely to cause injury/death (such as excavation, movement of machinery, cutting of vegetation etc.) must stop **when safe to do so** and the ecologist or environmental co-ordinator contacted to determine the best course of action.

When calling, leaving a message is insufficient - you must speak directly to an ecologist or environmental co-ordinator. They will then be able to advise you on the appropriate course of action.

At no time should you purposefully approach or attempt to handle a reptile.

Reptiles are fragile and incorrect handling can cause injury/death. **In addition, the UK supports a venomous species (the Adder), a bite from which is life threatening and is likely to require the administration of anti-venom at a hospital.**



**If a
reptile has been
seen on site, STOP ALL
WORKS LIKELY TO
CAUSE INJURY/DEATH
TO REPTILES and contact
the ecologist,
IMMEDIATELY on**

**DO NOT RISK BREAKING
THE LAW**

M

M

MOTT
MACDONALD

COMMON LIZARD



SLOWWORM



M

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**MOTT
MACDONALD**

GRASS SNAKE



M

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**MOTT
MACDONALD**

ADDER



C. Off Site Technical Note

Project:	Llanwern Rail Facilities		
Our reference:	367590-WTD-CAR-2659	Your reference:	
Prepared by:	Z Costas-Michael	Date:	26/09/2018
Approved by:	E C Probert	Checked by:	L Woolley
Subject:	Compensatory Land: Ecological Assessment and Recommendations		

1 Introduction

1.1 Background and Site Location

Mott MacDonald Ltd have been commissioned by Transport for Wales, on behalf of Welsh Government to undertake a baseline ecological assessment of land to the north of the Llanwern Steelworks site. This site is proposed for compensatory woodland planting for the Llanwern Rail Facilities scheme near to the village of Llanwern, South Wales (Ordnance Survey Grid Reference ST 36907 87302).

The purpose of this technical note is to document the baseline conditions of the land and identify any ecological constraints to inform the planting scheme and the viability of the area as a 'compensation site' (to which it is referred throughout the remainder of the note).

The compensation site covers an area of approximately 20.0ha and is located 0.8km north of the Llanwern Steelworks at OS Grid Reference ST 38496 88269 adjacent to the existing Tata Steel owned reservoir. The Llanwern Rail Facilities scheme is split into 5 phases and for Phase 1 the loss of woodland is anticipated to be a quantum of an approximately of 2.8ha.

A compensation ratio of 2:1 was agreed with Natural Resources Wales, and on that basis it is proposed to compensate for this loss with approximately 5.6ha of new woodland planting (some on site and some off-site; see Llanwern On-site and Off-site Long-term Management Plan and Llanwern On-site and Off-site Mitigation Plan, Report Ref: 367-590-WTD-CAR-2649 and 367-590-WTD-CAR-2648, Mott MacDonald 2018 for more details). The proposed compensation site is indicated as the red lined area within the site location plan provided in Figure 1 below:

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Figure 1: Compensation Site Location Plan

Source: DoBH, OS, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA | DigitalGlobe, Microsoft

2 Methodology

2.1 Field Survey

An initial field survey was undertaken by an experienced ecologist on the 13 September 2018. All habitats within the site, where accessible, were identified and mapped in compliance with the 'Handbook for Phase 1 Habitat Survey: a technique for environmental audit' (Joint Nature Conservation Committee guidelines (JNCC), 2010). Dominant plant species were noted, as were any protected, uncommon or invasive species listed in Schedule 9 of the Wildlife and Countryside Act (WCA)1981. An assessment was also undertaken of the likely presence or absence of protected and notable species within the Zone of Influence (Zoi) of the proposed works (i.e. areas within or adjacent to the site boundary that may be impacted by the proposed works). This was based on the known distribution of species, habitat suitability and/or direct evidence such as field signs or observations. The methodologies and assessment criteria used were based on current published guidance.

2.1.1 Identification of Waterbodies



The relevant 1:25,000 scale Ordnance Survey (OS) sheet and aerial photography were searched to check for waterbodies within 250m of the site boundary as recommended in the Great Crested Newt (GCN) Conservation Handbook (Langton *et al.*, 2001).

3 Survey Results

3.1 Habitats

The Extended Phase 1 Habitat Map is provided in Appendix A with associated target notes in Appendix B. Target notes are referred to as TN1, TN2 etc. in Table 1 below.

Table 1: Habitats as described in the Handbook for Phase 1 Habitat Survey (JNCC, 2010)

Habitats	Descriptions	Photo
Marshy Grassland	<p>The majority of the site is marshy grassland which extends across the hillside to the south-west.</p> <p>The habitat is dominated by hard rush (<i>Juncus inflexus</i>) with frequent creeping thistle (<i>Cirsium arvense</i>). Grass species present include crested dog's tail (<i>Cynpsurus cristatus</i>), perennial rye-grass (<i>Lolium perenne</i>), Yorkshire fog (<i>Holcus lanatus</i>) and red fescue (<i>Festuca rubra</i>). Occasional quaking grass (<i>Briza media</i>) was also recorded.</p> <p>As the site slopes to the south, a larger diversity and coverage of rush species were recorded including soft rush (<i>Juncus effusus</i>) and compact rush (<i>Juncus conglomeratus</i>).</p> <p>Glaucous sedge (<i>Carex flacca</i>) and false fox sedge (<i>Carex vulpina</i>) were occasionally recorded within the grassland.</p> <p>Other ground flora recorded on site include agrimony (<i>Agrimonia eupatoria</i>), tormentil (<i>Potentilla erecta</i>), meadow buttercup (<i>Ranunculus acris</i>), white clover (<i>Trifolium repens</i>) and stinging nettle (<i>Urtica dioica</i>).</p>	
Semi-improved Grassland (Neutral)	<p>To the south west of the reservoir lies an area of semi-improved grassland.</p> <p>The habitat is dominated by crested dog's tail, with abundant creeping thistle. Red fescue, Yorkshire fog and false-oat grass (<i>Arrhenatherum elatius</i>) were also recorded. Broad-leaved dock (<i>Rumex obtusifolius</i>) was abundant throughout the grassland.</p> <p>Occasional species recorded includes autumn hawkbit (<i>Leontodon autumnalis</i>), mouse-ear hawkweed (<i>Pilosella officinarum</i>), common daisy (<i>Bellis perennis</i>), cock's foot (<i>Dactylis glomerata</i>), red clover (<i>Trifolium pratense</i>), creeping buttercup (<i>Ranunculus repens</i>) and occasionally small patches of hard rush.</p> <p>Along the edge of the grassland, near the fenceline for the reservoir, the species diversity increased to include agrimony, common centuary (<i>Centrurium erthraea</i>), common mouse-ear, quaking grass, dove's-foot cranesbill (<i>Geranium molle</i>) and lesser trefoil (<i>Trifolium dubium</i>).</p> <p>Scattered scrub and trees were recorded to the west of the grassland which comprised native species such as hazel (<i>Corylus avellana</i>), hawthorn (<i>Crataegus monogyna</i>), oak (<i>Quercus robur</i>), silver birch (<i>Betula pendula</i>) and dog rose (<i>Rosa canina</i>).</p>	

Habitats	Descriptions	Photo
Improved Grassland	To the east of the reservoir, there is an area of improved grassland grazed by sheep. It largely comprises perennial rye-grass, crested dog's tail and red fescue. Creeping thistle, greater plantain (<i>Plantago major</i>), knotgrass (<i>Polygonum aviculare</i>), nettle, common daisy, mouse-ear hawkweed and common dandelion (<i>Taraxacum officinale</i> agg.) were also recorded in this habitat.	
Species Poor Hedgerow	To the south of the reservoir lies a species-poor hedgerow. The hedgerow was heavily managed and comprised hawthorn (<i>Crataegus monogyna</i>) and bramble.	
Earth Bank	An earth bank was recorded in the semi-improved grassland, largely colonised by tall ruderal vegetation. Species recorded on the earth bank include great willowherb (<i>Epilobium hirsutum</i>), nettle, ground ivy (<i>Glechoma hederacea</i>), creeping thistle, cock's-foot, Yorkshire fog and low growing bramble.	
Fence	A number of fences were recorded along field margins to separate livestock currently using the fields.	N/A

Source: Mott Macdonald Ltd

On the basis of the above results, the majority of habitats within the site are considered to be of negligible to low ecological value, comprising a limited range of common and widespread species. Nonetheless, the marshy grassland and the semi-improved grassland have been assessed against local Site of Importance for Nature Conservation (SINC) criteria (see Table 2 below).

Outside of the compensation site, woodland is present to the north and west of the reservoir which connects to further areas of woodland and hedgerows to the south and wider landscape. The adjacent woodland was surveyed from the site boundary and was noted to mostly comprise native species such as oak, silver birch (*Betula pendula*), ash (*Fraxinus excelsior*), beech (*Fagus sylvatica*) as well as sycamore (*Acer pseudoplatanus*). The visible understorey comprises hazel, hawthorn and holly (*Ilex aquifolium*) with ground flora present including woodruff (*Galium odoratum*), dog's mercury (*Mercurialis perennis*), ivy (*Hedera helix*) and lord's-and-ladies (*Arum maculatum*). This adjacent habitat is an ancient semi-natural woodland referred to as 'The Routes Wood' which is designated as a SINC (see Appendix A).

3.2 Identification of Waterbodies

The desk study identified the reservoir within 250m of the compensation site. The reservoir is a concrete structure approximately 300m in width which is used as a water source by Tata Steel Llanwern works to the south.

3.3 Species

Evidence of any protected or notable species was noted during the survey, along with an assessment of the suitability of the site to support such species and whether these would pose a constraint to proposed works. This is summarised below.

3.3.1 Breeding Birds

Gull species were recorded flying over the site during the species survey. The marshy grassland provides suitable habitat for ground nesting birds whilst the scattered scrub and trees also provide suitable nesting opportunities for birds. The adjacent woodland and reservoir also provide suitable habitat for breeding and overwintering birds.

3.3.2 Bats

No evidence of bats was observed during the survey. However, the grasslands are considered to provide suitable foraging and commuting habitats for bats. Scattered trees on site were noted to contain potential roost features (PRFs) such as knot holes and lifted bark, although these were not individually assessed for their roost suitability. The adjacent woodland also provides roosting, foraging and commuting habitat for bats.

3.3.3 Badgers

No evidence of badger was observed during the survey. The grasslands are considered suitable foraging habitat for badger. The adjacent woodland is also suitable for sett creation and foraging badgers.

3.3.4 Great Crested Newt

No evidence of great crested newt was observed during the survey. There is suitable terrestrial habitat for great crested newts in the form of semi-improved and marshy grassland. The stream is flowing and is deemed unsuitable to support great crested newts. The reservoir lacks any aquatic vegetation and has a high presence of water fowl. Therefore, it is considered that there are no suitable waterbodies within 250m of the site to support great crested newt and therefore this species is not considered to represent a constraint to the proposals.

3.3.5 Reptiles

No evidence of reptiles was observed during the survey. There is suitable habitat within the grasslands to support common reptile species.

3.3.6 Invertebrates

Large white butterfly (*Pieris brassicae*) and grasshoppers were recorded within the marshy grassland. The semi-improved and marshy grassland provide suitable habitat for common invertebrate species.

4 Assessment of Ecological Constraints and Recommendations

The planting included in the Llanwern On-site and Off-site Long-term Management Plan and Llanwern On-site and Off-site Mitigation Plan (Report Ref: 367-590-WTD-CAR-2649 and 367-590-WTD-CAR-2648, Mott MacDonald 2018) would link the hedgerows and woodland south to The Routes Wood SINC providing connectivity to the wider landscape and a larger footprint of woodland in the local area (once established).

On the basis of the survey results, the below table identifies potential ecological constraints to the proposed planting from the current habitats and species that could potentially be using the site along with appropriate recommendations:

Table 2: Assessment of Constraints and Recommendations

Ecological Features	Assessment	Recommendations
Marshy Grassland	<p>The species present have been compared to the Guidelines for Selection of Wildlife Sites in South Wales (Gwent Wildlife Trust, 2004). According to the guidance, a marshy grassland should be considered species-rich if 12 or more of the species listed in this document are recorded on site. A total of four of these species were recorded within the marshy grassland, including; quaking grass, tormentil, compact rush and glaucous sedge.</p> <p>The grassland is therefore not considered to be of SINC quality whilst based on the overall species assemblage and structure, this grassland is not considered to be of particular ecological value at a local level.</p>	N/A
Semi-improved Grassland (Neutral)	<p>The species present have been compared to the Guidelines for Selection of Wildlife Sites in South Wales (Gwent Wildlife Trust, 2004). According to the guidance, a semi-improved neutral grassland should be considered species-rich if eight or more species or more of the species listed in this document are recorded on site. A total of four of these species were recorded on site, including, red clover, agrimony, quaking grass and mouse-ear hawkweed.</p> <p>The grassland is therefore not considered to be of SINC quality whilst based on the overall species assemblage and structure, this grassland is not considered to be of particular ecological value at a local level.</p>	N/A

Ecological Features	Assessment	Recommendations
Improved Grassland	The improved grassland is of low ecological value with limited grasses and few common herb species.	N/A
Other Habitats	The remaining habitats within the site comprise species which are common and widespread at a local level and therefore do not pose a constraint.	
Breeding Birds	The marshy grassland may be suitable to support ground nesting birds. Planting within this habitat may disturb or destroy nests.	<p>All planting works should be undertaken outside the nesting season. This is widely considered to be from March to August inclusive, but can vary depending on the species and / or seasonal conditions.</p> <p>It is unlikely that planting will be undertaken outside of the above time period due to the constraints of the planting season.</p> <p>In the unlikely event that planting is undertaken within the nesting period, pre-clearance check must be undertaken by an experienced ecologist to identify if any birds are nesting within or close to the vegetation due to be disturbed. If a bird nest is found, it must be left in-situ and protected from works. No works can be undertaken in that area until the young birds have fledged from the nest site, which may take up to 6 weeks depending on the species.</p> <p>All planting should be restricted where possible to daylight hours to prevent disturbance of roosting and nesting birds at dusk and dawn.</p> <p>A site-specific toolbox talk should be given to all site staff prior to works commencing.</p> <p>If evidence of breeding birds is found, work should cease until advice has been obtained from the site ecologist.</p>
Bats	The grassland is likely to provide habitat for foraging and commuting bats. Scattered trees may also provide roosting opportunities. Planting will increase the available habitat for roosting bats in futures years whilst still retaining suitable for foraging and commuting bats.	Retained trees should be protected in accordance with BS5837:2012.
Badgers	There is suitable habitat in the form of semi-improved grassland for foraging badgers. Planting within this habitat may extend the area available for sett creation whilst still retaining suitable for foraging badgers.	A site-specific toolbox talk should be given to all site staff prior to works commencing.
Reptiles	The semi-improved and marshy grasslands provide suitable habitat for reptiles. Reptiles may be killed or injured during planting works within the site.	<p>A site-specific toolbox talk should be given to all site staff prior to works commencing.</p> <p>Planting works are likely to be undertaken in the winter period. Any hibernacula suitable for reptiles should be avoided. If hibernacula cannot be avoided, it should be dismantled by hand by a supervising ecologist and re-instated along the edge of the new planting area. Any reptiles will be carefully moved by the supervising ecologist outside of the planting zone.</p> <p>Any clearance of vegetation to allow for planting should be conducted in a phased manner under the supervision of an experienced ecologist.</p> <p>If evidence of reptiles is found, work should cease until advice has been obtained from the site ecologist.</p>
Invertebrates	The semi-improved and marshy grasslands provide suitable habitat for common and widespread invertebrates. No food plants for protected or notable invertebrates were recorded during the survey	N/A

Ecological Features	Assessment	Recommendations
and the surrounding habitat in the form of Craig-y-Perthi Field South SINC and Craig-y-Perthi Field North SINC provides greater plant species diversity for this species group.		

Source: Mott MacDonald Ltd

5 Conclusions

A Phase 1 survey was undertaken to assess the baseline condition of the land to the north of the Llanwern Steelworks site for its suitability for use as compensatory land for the Llanwern Rail Facilities scheme.

No significant ecological constraints to the proposed planting works have been identified. Marshy grassland, semi-improved grassland, improved grassland, scattered trees, scattered scrub and an earth bank were recorded on site. The grasslands on site failed to meet the criteria for SINC selection according to current guidance (South Wales Wildlife Sites Partnership, 2004) whilst remaining habitats are considered of low ecological value. The site provides habitat for breeding birds, foraging and commuting bats, foraging badgers, reptiles and common invertebrates. Recommendations are provided in Section 4 to avoid impacting on these species during planting works whilst new planting will provide continued or enhanced opportunities for many of these species in the long-term.

6 References

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D. Method Statements

D.1 Breeding Birds Method Statement (Document number:367590-WTD-CAR-2660)



Llanwern Rail Facilities - Phase 1 Planning

Breeding Birds Method Statement

September 2018

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Llanwern Rail Facilities - Phase 1 Planning

Breeding Birds Method Statement

September 2018

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	24/09/18	Z Costas-Michael	C Williams	E C Probert	Draft issue – for TFW only
B	28/09/18	Z Costas-Michael	C Williams	E C Probert	Pre-Application Consultation

Document reference: 367590-WTD-CAR-2660

Information class: Standard

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A.		

1 Introduction

1.1 Project Description

Mott MacDonald (MM) has been commissioned by Transport for Wales (TfW), on behalf of Welsh Government, to prepare and submit a planning application, seeking full planning permission for the design and construction of a 1.6km long Major Events Stabling Line (MESL) on land adjacent to the existing Tata Steelworks Service Lines in Llanwern, South Wales. This is Phase 1 of the Llanwern Rail Facilities Programme.

The MESL will be used for stabling of rolling stock for major events in the area, to enable flexibility for future train requirements, and proving of trains prior to use on the rail network. The MESL will be electrified in a future phase of work. This proposed 1.6km length of MESL to the west of Monks' Ditch was formerly known as Option 6a.

The wider Llanwern Rail Facilities Programme will include an extension of the MESL by circa 2.4km east (to achieve a total length of circa 4km), electrification of the MESL, a new Llanwern railway station and passenger line (including Park & Ride and footbridge), and connections to the South Wales Main Line (Relief Lines). The further phases of the project will be the subject of a subsequent planning application.

- The key parameters for the Scheme are listed below:
- Whole Site area is 3.1 hectares. This land is contained within the red line boundary shown on the Site Location Plan (Drawing number 367590-MMD-48-XX-DR-C-0001); and
- The Site length is approximately 1.6km long and 19m wide.

1.2 Scope of Works

The General Arrangement drawings (Drawing numbers 367590-MMD-48-XX-DR-C-0002 to 367590-MMD-48-XX-DR-C-0005) demonstrate the project scope which includes the design and construction of the following:

- A single track stabling line (MESL) circa 1.6km long;
- Associated earthworks and landscaping; and
- Drainage and other engineering works.

In order to obtain full planning permission for Phase 1, we have carried out the outline design and technical assessment of the above scope, as well as multiple assessments in terms of ecology, environment, heritage and archaeology.

1.3 Site Location

The proposed rail development Site is located approximately 8 miles east from the centre of Newport, South Wales (Figure 1.1).

The Site is aligned roughly west – east and bordered by the existing South Wales Mainline to the north and the Tata Steelworks to the south. Along the southern boundary of the steelworks site runs the A4810 which links the M4 from junction 23A at Magor with the A48 at Liswerry (a predominantly residential suburb on the south-eastern side of Newport). The Site is more widely bordered by the M4 which runs approximately two and a half miles to the north and the Severn

Estuary which lays approximately three miles to the south. The Gwent Levels to the south is a significant area of wetlands.

The existing South Wales Mainline passes north of the proposed site and provides opportunity for transport links for both passengers and freight.

Figure 1.1: Proposed Location Plan



Source: OS Open Data

1.4 Scope of the Report

This report sets out an ecological method statement for the protection of breeding birds during the construction at the site. The objectives of this report are to:

- Detail the assessment of the likely presence of breeding birds within the site;
- Identify the proposed works which could impact breeding birds;
- Set out an appropriate protocol to be followed by all contractors to ensure breeding birds are properly considered; and
- Provide appropriate site-specific mitigation safeguards and working methodology to protect breeding birds during all works.

2 Ecology Context

2.1 Ecology

Common species of bird typically nest between March and August (inclusive). Some species will have multiple broods during this time, with each fledging after approximately 6 weeks.

The types of habitat found within the survey boundary which are likely to support breeding birds include:

- Woodland/ woodland edge;
- Scrub;
- Reens; and
- Buildings.

Whilst natural habitats are the preferred nesting locations, it should be noted that it is common for birds to utilise vehicles and machinery that have been left idle on site.

2.1.1 Schedule 1 Species

Cetti's warbler (*Cettia cetti*) and kingfisher (*Alcedo atthis*) have been recorded as possibly and probably breeding respectively within the survey area. Cetti's warbler have also been recorded just outside of the survey area to the west as probably breeding at Ringland Way Marsh Site of Importance for Nature Conservation (SINC).

Cetti's warbler typically breeds between April and July and can have multiple broods within this period. The typical fledging time for young is estimated to be approximately 14 to 16 days (BTO, 2018 & RSPB, 2018). This species is typically associated with dense marshy vegetation such as reedbeds and other marginal vegetation close to waterbodies.

Kingfisher typically breeds between the end of March and July and can have multiple broods within this period. The typical fledging time for young is estimated to be approximately 25 days (10-12 days later when foraging is poor) (BTO, 2018 & RSPB, 2018). This species is typically associated with river systems and marshes.

2.2 Identification

Photographs below give examples of birds' nests that could be encountered during the vegetation clearance works:

Photo 1: Example birds nest found within the survey boundary



Source: Mott MacDonald Ltd

Photo 2: Example birds nest found within the survey boundary



Source: Mott MacDonald Ltd

2.3 Identifying an active nest

The ecologist will look for the following signs to identify if a nest is active or inactive:

- Fresh material, moss can remain green especially in nests lined with mud but other vegetation will rot over time;
- Do the ends of any twigs look fresh, overtime these will dry out;
- Fresh feathers; and
- Old evidence of broken shells and droppings.

Examples of nests an ecologist would be searching for can be found in the Toolbox talk in Appendix A.

3 Legislation

3.1 Legislation

All birds, their nests and eggs are legally protected under the Wildlife and Countryside Act 1981 (as amended) during the breeding season (considered to be March to August inclusive).

Whereby it is an offence to intentionally or recklessly:

- Kill, injure or take any wild bird;
- Take, damage or destroy the nest of any wild bird whilst it is in use or being built; or
- Take or destroy the egg of any wild bird.

Under the Wildlife and Countryside Act (WCA), a wild bird is defined as any bird of a species that is resident within the UK or is a visitor to the European Territory of any Member State in a wild state.

For birds listed on Schedule 1 of the WCA, it is also an offence to intentionally or recklessly:

- Disturb a species listed on Schedule 1 that is at, on or near an 'active' nest.

If works are intended near a nest of a Schedule 1 species a licence must be obtained from the relevant statutory body (Natural Resources Wales).

If any of the aforementioned offences are committed, then penalties for breaking the law can include large fines and / or possible imprisonment and seizure of equipment.

4 Ecological Baseline

4.1 Desktop Survey Results

A desk study was undertaken to identify key species and habitats near and adjacent to the survey boundary (South East Wales Biodiversity Records Centre (SEWBRc), 2017). The results are presented in the following sections.

4.1.1 Statutory Designated Sites

There is one statutory designated site, the River Usk (Lower Usk) / Afon Wysg (Wysg Isaf), that is noted for having a good range of breeding birds associated with riverine habitats (Countryside Council for Wales, 1996). Details of which are provided below in Table 1.

Table 1: Statutory Designated Site

Name	Status	Details	Distance and Direction
River Usk (Lower Usk)/ Afon Wysg (Wysg Isaf)	SSSI ¹	<p>The River Usk (Lower Usk) is a rare example of a large mesotrophic lowland river which has not been subject to significant modification by man. Of particular significance to the river's morphology and biology are the extensive deposits of fluvio-glacial and alluvial material in the Usk valley, between Abergavenny and Newport.</p> <p>The river shows a clear downstream succession in plant communities due in part to the rapid transition from mesotrophic to nutrient rich in its lower reaches and increasing salinity as it nears its confluence with the Severn Estuary.</p> <p>Whilst not a special feature of the site, there is a good range of breeding birds associated with the riverine habitats.</p> <p>The SSSI incorporates adjacent areas of riparian habitat which directly support the special interest of the river. These include woodlands dominated by alder (<i>Alnus glutinosa</i>) and willow (<i>Salix spp.</i>, marshy grassland, stands of tall herbs, swamp and fen vegetation, salt-marsh and coastal grassland.</p>	1.8km W

4.1.2 Non-Statutory Designated Sites

There are twenty-six non-statutory designated sites within 2.0km of the site, four of which note the presence of Cetti's warbler, these are detailed in Table 2 below:

Table 2: Non-Statutory Designated Sites (Referencing Cetti's Warbler)

Name	Status	Details	Distance and Direction
Ringland Way Marsh	SINC	Reed, swamp and marsh, with wet grassland areas; supports bird species including Cetti's warbler and reed bunting (a Species of Principal Importance).	Adjacent – W of the survey boundary
Greenmoor Pool	SINC	Formerly standing water which now supports reed swamp (a priority habitat), which itself	Adjacent – E of the survey boundary

¹ Site of Special Scientific Interest (SSSI)

Name	Status	Details	Distance and Direction
		supports bird populations including Cetti's warbler.	
Solutia Site	SINC	A series of improved and semi-improved grasslands with traditional ditches and ponds; site supports a range of species including nesting birds such as Cetti's warbler, and invertebrates including hairy dragonfly.	1.5km S
Elver Pill Reen, Grassland & Pond	SINC	Lagoon with mosaic of swamp and marshy and dry semi-improved neutral grassland; supports Cetti's warblers.	1.9km S

4.1.3 Biological Records

4.1.3.1 SEWBRc Data

A number of Schedule 1 bird species records were returned from within 2.0km of the site, many of which appear to be associated with open wetland habitats in the local area such as the Gwent Levels. Those considered of relevance to the site (given the habitats present) are listed in Table 3 below along with the number of records present and closest record for each species:

Table 3: Relevant Schedule 1 Bird Records within 2.0km of the Site

Species	Scientific Name	Number of records	Closest Record	
			Distance	Direction from the Site
Barn Owl	<i>Tyto alba</i>	1	1.1km	N
Cetti's Warbler	<i>Cettia cetti</i>	7	0.1km	NW
Kingfisher	<i>Alcedo atthis</i>	2	1.2km	SW

Source: SEWBRc

In addition, a number of records of 'priority species' (those listed as species of principal importance under Section 7 of the Environment (Wales) Act 2016) were returned from within 2.0km of the site:

- House sparrow (*Passer domesticus*);
- Dunnock (*Prunella modularis*);
- Song thrush (*Turdus philomelos*);
- Lapwing (*Vanellus vanellus*);
- bullfinch (*Pyrrhula pyrrhula*);
- Lesser spotted woodpecker (*Dendrocopos minor*);
- Grasshopper warbler (*Locustella naevia*);
- Black headed gull (*Chroicocephalus ridibundus*);
- Kestrel (*Falco tinnunculus*);
- Cuckoo (*Cuculus canorus*);
- Linnet (*Linaria cannabina*); and
- Starling (*Sturnus vulgaris*).

4.2 Breeding Bird Survey

A total of 42 species were recorded during the breeding bird surveys. Records of species for which there are statutory instruments governing their protection and a duty to conserve (herein referred to as notable species) include the following (note that some species are cited in more than one statutory and conservation categories):

- Two² species listed on Annex I of the Birds Directive or Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) or those recognised by the Rare Breeding Birds Panel (RBBP) were identified on site;
- Six species listed on the Newport Local Biodiversity Action Plan (LBAP); and
- Six species of principal importance;

'Birds of Conservation Concern', a measure to convey concern and help set priorities for conservation action (Eaton *et al.*, 2015), were recorded and include:

- Six Red Listed (BoCC) species;
- Ten Amber Listed (BoCC) species; and
- Twenty-six green Listed (BoCC) species.

4.2.1 Breeding Status

The breeding status of species and the status of protected and/or notable species summarised in Table 4 below:

Table 4: Notable species recorded during the surveys

Species	Breeding Evidence	Likely Territories			
		Sch 1	Section 7	LBAP	
Cetti's warbler	Possible	X		X	Yes – outside of the survey area adjacent to Ringland Way Marsh SINC
Kingfisher	Probable	X			Yes – recorded on two occasions at Monks' Ditch (including a pair)
Song Thrush	Probable		X	X	Yes – males recorded singing on two or more occasions in the same areas
Dunnock	Probable		X	X	Yes - males recorded singing on two or more occasions in the same areas
Bullfinch	Confirmed		X	X	Yes – males recorded in suitable habitat on two or more occasions in the same areas (also recorded carrying food)
Linnet	Possible		X	X	No – only recorded on a single occasion within the survey area

4.2.2 Schedule 1 Species

Cetti's warbler have been recorded as possibly breeding on site with a likely territory held to the west of the site, outside the survey area. Ringland Way Marsh SINC is designated due to reedswamp and marsh, with wet grassland areas which supports Cetti's warbler as per Table 2.

² Kingfisher was recorded incidentally during other surveys by ecologists.

The territories held likely incorporate the SINC habitats as this is typical habitat of breeding Cetti's warbler.

4.2.2.1 Kingfisher

Kingfisher have been recorded as probably breeding on site with a pair recorded at Monks Ditch. The banks of the watercourse provide suitable nesting habitats for this species and as such their presence on site cannot be ruled out.

5 Proposed Safeguards

5.1 Kingfisher Pre-Works Survey

Works near to Monks' Ditch should be targeted for clearance outside of the breeding bird period to avoid any potential impacts on kingfisher.

Prior to any works in close proximity to Monks' Ditch, an experienced ornithologist should survey the banks prior to any works commencing on site. This pre-works survey will determine activity on site and if this species is confirmed breeding on site. If kingfisher are found to be nesting within the banks of Monks' Ditch, a buffer would be required around active nesting burrows to avoid potential disturbance. This is to be agreed as part of consultation with the local authority and a suitably qualified ecologist.

It is anticipated that no direct works will be undertaken to Monks' Ditch itself.

5.2 Vegetation Clearance Methodology

Prior to any woody vegetation clearance that is required during the breeding season (March to August inclusive), a nesting bird check should be undertaken by a suitably qualified ecologist within 48 hours of the works commencing.

To check if a nest is active the following method will be employed:

- The ecologist will attend site prior to any contractors entering the area, when the area should be quieter. A search will be undertaken for nests using binoculars. Any potentially active nest or areas of dense vegetation where nests could be present should be watched (as well as the surrounding area) for any bird activity which may indicate nesting, including:
 - Birds carrying nest material, food or faecal sacs and note direction of flight;
 - Birds repeatedly singing from song posts, one of these is usually close to nest;
 - Birds on sentry duty, this is often near the nest;
 - Birds showing agitated behaviour and repeated calling;
 - Males accompanying females; males of some species accompany the female back to nest; and
 - Begging calls of chicks.
- Survey duration will depend on the area being checked. Checking individual trees could take less than 10 minutes whilst watching dense vegetation would require observing bird activity for at least half an hour. This will be judged by the ecologist on site; and
- In densely vegetated areas which cannot be fully inspected, ecological supervision of phased clearance will be undertaken, whereby accessible areas are checked, a cut is undertaken and then the next area is checked (and so on) until either the area is cleared or birds are found and cordoned off.

The ecologist will follow the methodology listed above to identify any active birds nests within of any proposed clearance works:

- If any Schedule 1 species or their nests are located on site, a buffer zone will be agreed as part of consultation with the local authority and with a suitably qualified ecologist; and

- If active nests of other, non-Schedule 1 species are recorded, a 5.0m buffer will be set up around the nest. No works will be undertaken within this buffer until the nest is has been confirmed inactive by an ecologist (after young have fledged).

5.2.1 General Construction Safeguards

In addition to the specific measures outlined above, general construction safeguards can be implemented to avoid the risk of birds using vehicles and other machinery. These are as follows:

- Avoid leaving vehicles and machines parked near boundary fences, walls and close to vegetation;
- Any gaps in excess of 22mm in diameter may be sufficient for birds to enter. Where possible, vehicles and other machinery that are idle can have any holes and ledges temporarily blocked with soft packaging materials;
- As set out above, daily checks of vehicles and other machinery, for nests should be undertaken before any vehicles or machines are started; and
- Any stockpiles on site should be netted to avoid bird species using gaps within the stockpiles.

6 References

British Trust for Ornithology (BTO) website. Available URL: <https://www.bto.org/>

Royal Society for the Protection of Birds (RSPB) website. Available URL:
<https://www.rspb.org.uk/>

South East Wales Biodiversity Records Centre (SEWBRc) (2017) *Biodiversity Information Search: Llanwern*

Appendices

A. Toolbox Talk

14

A. Toolbox Talk

TOOLBOX TALK: **BREEDING BIRDS**

More than 400 species of bird are regularly recorded in the UK. Different species have different preferences for nesting habitat.

Woodland, scrub, hedgerows and buildings are all potential nesting opportunities for breeding birds. Many birds also nest on the ground within short or tall vegetation, such as arable fields.

Evidence suggests that the site of proposed works may support breeding birds. Vegetation clearance between March and August inclusive can damage active bird nests.

LEGISLATION

Under UK law (*Wildlife and Countryside Act, 1981*) it is an offence to:

- intentionally kill, injure or take any wild bird;
- to take, damage or destroy the nest (whilst being built or in use) or eggs of any wild bird;
- To possess a wild bird (dead or alive) or their eggs.

Penalties for breaking the law can include **large fines**, **imprisonment** and the **seizure of equipment**.

ESSENTIAL PRE-WORKS CHECK

It is essential that prior to any works involving clearance or disturbance of vegetation a check for birds nests must be undertaken. **A CHECK FOR BIRDS NESTS WILL NEED TO BE UNDERTAKEN IMMEDIATELY BEFORE THE COMMENCEMENT OF WORKS AND ON EVERY DAY THAT WORKS ARE TO TAKE PLACE.**

THINK....

- Are there many birds active around the area to be affected?
- How are they behaving – behaviour that indicates breeding activity includes:
- Birds carrying nesting material (twigs, leaves, hair)
- Birds regularly flying to and from the same spot
- Birds repeatedly calling or behaving in an agitated/alarmed way
- Juvenile birds being fed by adult

If you are unsure, contact the Project Environmental Representative.



**If you suspect there is a
bird's nest present
within the works area,
STOP ALL INVASIVE
WORKS and contact the
Project Environmental
Representative
IMMEDIATELY.**

**DO NO RISK BREAKING
THE LAW.**



D.2 Badger Method Statement (Document number: 367590-WTD-CAR-2661)



Llanwern Rail Facilities - Phase 1 Planning

Badger Method Statement

September 2018

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Llanwern Rail Facilities - Phase 1 Planning

Badger Method Statement

September 2018

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	24/09/18	Z Costas-Michael	C Williams	E C Probert	Draft Issue – For TfW Review Only
B	28/09/18	Z Costas-Michael	C Williams	E C Probert	Pre-Application Consultation Issue

Document reference: 367590-WTD-CAR-2661

Information class: Standard

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1 Introduction

1.1 Project Description

Mott MacDonald (MM) has been commissioned by Transport for Wales (TfW), on behalf of Welsh Government, to prepare and submit a planning application, seeking full planning permission for the design and construction of a 1.6km long Major Events Stabling Line (MESL) on land adjacent to the existing Tata Steelworks Service Lines in Llanwern, South Wales. This is Phase 1 of the Llanwern Rail Facilities Programme.

The MESL will be used for stabling of rolling stock for major events in the area, to enable flexibility for future train requirements, and proving of trains prior to use on the rail network. The MESL will be electrified in a future phase of work. This proposed 1.6km length of MESL to the west of Monks' Ditch was formerly known as Option 6a.

The wider Llanwern Rail Facilities Programme will include an extension of the MESL by circa 2.4km east (to achieve a total length of circa 4km), electrification of the MESL, a new Llanwern railway station and passenger line (including Park & Ride and footbridge), and connections to the South Wales Main Line (Relief Lines). The further phases of the project will be the subject of a subsequent planning application.

- The key parameters for the Scheme are listed below:
- Whole Site area is 3.1 hectares. This land is contained within the red line boundary shown on the Site Location Plan (Drawing number 367590-MMD-48-XX-DR-C-0001); and
- The Site length is approximately 1.6km long and 19m wide.

1.2 Scope of Works

The General Arrangement drawings (Drawing numbers 367590-MMD-48-XX-DR-C-0002 to 367590-MMD-48-XX-DR-C-0005) demonstrate the project scope which includes the design and construction of the following:

- A single track stabling line (MESL) circa 1.6km long;
- Associated earthworks and landscaping; and
- Drainage and other engineering works.

In order to obtain full planning permission for Phase 1, we have carried out the outline design and technical assessment of the above scope, as well as multiple assessments in terms of ecology, environment, heritage and archaeology.

1.3 Site Location

The proposed rail development Site is located approximately 8 miles east from the centre of Newport, South Wales (Figure 1.1).

The Site is aligned roughly west – east and bordered by the existing South Wales Mainline to the north and the Tata Steelworks to the south. Along the southern boundary of the steelworks site runs the A4810 which links the M4 from junction 23A at Magor with the A48 at Liswerry (a predominantly residential suburb on the south-eastern side of Newport). The Site is more widely bordered by the M4 which runs approximately two and a half miles to the north and the Severn

Estuary which lays approximately three miles to the south. The Gwent Levels to the south is a significant area of wetlands.

The existing South Wales Mainline passes north of the proposed site and provides opportunity for transport links for both passengers and freight.

Figure 1.1: Proposed Location Plan



Source: OS Open Data

1.4 Scope of the Report

This report sets out an ecological method statement for the protection of badgers during the construction at the site. The objectives of this report are to:

- Detail the assessment of the likely presence of badgers within the site;
- Identify the proposed works which could impact badgers;
- Set out an appropriate protocol to be followed by all contractors to ensure ecology is considered; and
- Provide appropriate site-specific mitigation safeguards and working methodology to protect badgers during all works.

2 Ecology Context

The Eurasian badger, a member of the family Mustelidae, is widely distributed throughout the United Kingdom. Habitat has become more fragmented over time for badgers, which are moving into any suitable habitat available and adapting to urban environments.

2.1 Identification

Badgers can grow up to one metre in length, they are short and stocky with loosely fitting skin. Their fur is black and white, with the appearance of a grey colour on the body. Their heads are white with two iconic black stripes from their snouts along their eyes and to their ears (Photo 1).

Photo 1: Badger in the daylight



Source: Mott MacDonald Ltd

They have powerful, muscular necks and forelegs, as well as strong claws which help in digging their burrows known as setts. They live in family and social groups known as clans¹, and have territories demarcated by latrines and through scent marking.

2.2 Setts

A sett is described as any structure or place that shows signs that indicate it is currently being used by badgers. This means any tunnels or chambers and the areas immediately surrounding the entranceways are all part of the sett. Other structures badgers may use for shelter include spaces among rocks and boulders; under garden sheds; under raised buildings; among hay bales; and under hedges.

Each clan holds a main sett which is continuously occupied and used for breeding. The main nesting chamber within the sett is usually 5.0m to 10.0m from the tunnel entrance and 3.0m below the surface.

¹ Clans can range from 2 – 20 adult badgers (though 6 is more usual)

In addition to the main sett, clans may have a number of other setts with different uses including:

- Annex setts – usually less than 150.0m from the main sett and generally connected by well-worn paths;
- Subsidiary setts – over 150.0m from the main sett, it is unlikely to be in constant use; and
- Outlier setts – these are usually one or two entrance holes that are used sporadically.

Where badger setts are discovered, their activity level can be assessed and classified as below:

- Active setts – generally large spoil heaps found outside, recently excavated, with well-worn paths present between entrances and leading away into the surrounding habitat, the area is generally clear of vegetation;
- Partially / seasonally active setts – generally only one or two entrance holes with spoil heaps outside, fresh spoil may not have been added recently. The sett is not in constant use, however it may have been used earlier in the season or during the previous season. Generally, the area is clear of vegetation, though a small amount of leaf litter / debris may have collected in the entrance ways. Paths leading to the entranceways are less well-worn and cobwebs may be present across the entrances (indicating that it has not been used recently). This sett will not be part of the main sett; and
- Disused setts – these are setts that have not been used for at least one season. Generally, they have large amounts of leaf litter / debris collected in the entranceway and vegetation is likely to have grown up around it. There will be no obvious paths leading to and from the entrances and is likely to have weathered and become vegetated.

3 Legislation

Badgers are protected in the UK under the Protection of Badgers Act 1992, which makes it an offence to:

- Wilfully capture, kill or injure (or attempt to capture, kill or injure) a badger;
- Intentionally or recklessly damage, destroy or block access to their setts; and
- Disturb badgers in setts.

Penalties for breaking the law can include large fines, imprisonment and the seizure of equipment.

Some burrows and disused badger setts found along railway embankments such as those within the site may be linked to foxes and rabbits. These, along with all wild species of mammal are protected under the Wild Mammals (Protection) Act 1996. Whereby it is an offence to:

- Mutilate, kick, beat, nail, or otherwise impale, stab, burn, stone, crush, drown, drag or asphyxiate any wild mammal with the intent to inflict unnecessary suffering.

4 Ecological Baseline

4.1 Desktop Survey Results

One record of a badger sett was returned from the data search. The record is 1.9km away from the survey area and was submitted in 2013 (SEWBRcC, 2017).

During 2014, protected species surveys were undertaken to inform the M4 Corridor proposal. Two main setts were recorded within Tata Steel land during these walkovers, with a further annex sett identified close to one of the main setts. During the 2015 surveys, only one of the main setts was observed, this appeared to be disused and was recorded to have debris present, the other two setts were not observed due to dense scrub and reedbed (Welsh Government, 2016).

4.2 Badger Survey Results

During surveys in 2017, a confirmed disused outlier sett was observed within the survey area. A second disused, collapsed outlier sett was also observed, along with signs of foraging and badger dung. No evidence of recently active badgers was recorded during this survey.

Additional badger evidence was observed during spring and summer 2018 which comprised two latrines, a disused outlier sett and an active subsidiary sett. Camera trapping surveys also recorded badgers in six locations across the survey area.

Badgers may use the linear features of the railway line as pathways and territorial boundaries, this would account for the lack of badger paths observed through the woodland. Due to the time of year the initial badger survey was undertaken, it is possible that badgers were less active and therefore would not be actively occupying their territorial extent. During 2018, badgers were recorded using the survey area.

Based on the evidence recorded on survey, badgers are using the site to forage and also for sett creation. Badger setts cannot be ruled out within inaccessible locations of dense scrub. The active sett is located approximately 1.5km away from the site boundary.

5 Proposed Safeguards

5.1 Update Check

As badgers can leave existing setts and establish new setts very quickly, the following recommendations should be applied to prevent any impacts on badger:

- An update check is recommended 12 weeks prior to the commencement of works on site;
- The walkover will establish if there is evidence on site that the setts recorded are currently active or inactive as well as to ascertain if any new setts have been created which would affect the proposed works; and
- If evidence of an active badger sett, which is considered to be affected by any works (such as excavation or vegetation clearance within 20.0m or pile driving within 100.0m), is recorded during the pre-works walkover, then Natural Resources Wales (NRW) should be contacted to see if a licence will be required.

5.2 General Construction Safeguards

Badgers can become stressed easily, particularly sows (females) during the pregnancy and rearing periods. Any works in the form of vegetation clearance, digging, pile driving and other high-level noise and vibration works may cause disturbance to badgers in their setts. The following measures are recommended for initial vegetation clearance works within the site:

- Toolbox talks are recommended to be given to all site staff, by a qualified ecologist, prior to any works being undertaken (Appendix A);
- Where vegetation clearance is required, a suitably qualified ecologist should supervise works;
- Where excavation is required, it should be kept a minimum of 20.0m from any sett as tunnels of setts may extend up to 20.0m. Excavation works and use of heavy machinery could result in damage and possible collapse of a sett;
- Any excavation should be fenced off and / or covered to avoid animals becoming trapped. A mammal ladder should be placed in any excavation left open to allow any animals that may become trapped to escape;
 - All excavations should be checked each morning to ensure no badgers or other animals have become trapped overnight; and
 - If a badger is found within an excavation, then a qualified ecologist should be contacted immediately for advice.
- Soil storage – consideration should be given to where spoil is stored, if likely to be stored for a long period of time then badger proof fencing should be considered;
- Where works cannot be restricted to daylight hours and where lighting is required, hoods should be used and lights directed at works and away from any setts;
- Chemicals, including fuel for equipment and machinery, should not be used within 20.0m of any sett. Chemicals should be stored following best practice guidelines; and
- No equipment should be stored within suitable badger habitat.

If badgers and / or their setts are found to be present within the work area at any time during the works, it will be necessary for all activity to cease until further advice is sought from the qualified

ecologist. Appropriate action can then be taken. NRW may be contacted depending on the circumstances.

6 References

Mott MacDonald (2018) TO026 Llanwern Station – Badger Survey Report (Report Reference: 367590-WTD-CAR-2624)

South East Wales Biodiversity Records Centre (SEWBRc) (2017) *Biodiversity Information Search: Llanwern*

Welsh Government (2016) M4 Corridor around Newport: Environmental Statement Volume 1 Chapter 10: Ecology and Nature Conservation. Available URL:
<http://gov.wales/docs/det/policy/160310-m4-es-c10-ecology.pdf>

Appendices

A. Toolbox Talk

11

A. Toolbox Talk

TOOLBOX TALK: **Badgers**

Badgers live in underground setts made up of tunnels and chambers visible as single, or groups, of holes. These holes are at least 25 cm wide and 20 cm high. (An entrance to a sett is illustrated overleaf). Badgers are nocturnal animals so you are unlikely to see them during the day.

Evidence suggests that badgers may be present within the vicinity of the proposed work. Even if a badger sett has not been discovered onsite, there is potential for badgers to establish a sett during the works and/or for a sett to already be present but undetected under dense scrub or vegetation.



LEGISLATION

Under UK law (*Protection of Badgers Act 1992*), it is an offence to wilfully kill, injure, take or possess a badger, or attempt to do so, and to intentionally or recklessly damage, destroy or obstruct access to a badger sett, or to disturb a badger while it is occupying a sett. Penalties for breaking the law can include **large fines**, **imprisonment** and the **seizure of equipment**.

Disturbance of a badger occupying a sett (potentially via noise or vibration) can lead to prosecution.

WHAT TO DO IF YOU FIND A BADGER SETT

If at any time during the works a potential badger sett is discovered within 30m of the proposed works, all works should halt (when safe to do so) and the Ecologist or Environment Team must be contacted immediately. If there is any doubt contact the Ecologist or Environment Team.

Call _____ and ask for an Ecologist. Leaving a message is insufficient - you must speak directly to the Ecologist or a member of the environment Team. They will then be able to advise on legal and most appropriate course of action.

If there is any suspicion that badgers are present within 30m of the site, STOP ALL WORKS and contact the site Ecologist IMMEDIATELY on

DO NOT RISK BREAKING THE LAW

Badger Sett Entrances



D.3 Otter and Water Vole Method Statement (Document number: 367590-WTD-CAR-2662)



Llanwern Rail Facilities - Phase 1 Planning

Otter and Water Vole Method Statement

September 2018

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Llanwern Rail Facilities - Phase 1 Planning

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September 2018

Issue and Revision Record

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A	24/09/18	Z Costas-Michael	C Williams	E C Probert	Draft Issue – For TfW Review Only
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Estuary which lays approximately three miles to the south. The Gwent Levels to the south is a significant area of wetlands.

The existing South Wales Mainline passes north of the proposed site and provides opportunity for transport links for both passengers and freight.

Figure 1.1: Proposed Location Plan



Source: OS Open Data

1.4 Scope of the Report

This report sets out an ecological method statement for the protection of otters and water voles during the construction works at the site. The objectives of this report are to:

- Detail the assessment of the likely presence of otters and water voles within the site;
- Identify the proposed works which could impact otters and water voles;
- Set out an appropriate protocol to be followed by all contractors to ensure ecology is considered; and
- Provide appropriate site-specific mitigation safeguards and working methodology to protect otters and water voles during all works.

2 Ecology Context

2.1 Otter

Otters are members of the Mustelidae family which also includes badger (*Meles meles*), stoat (*Mustela erminea*) and polecat (*Mustela putorius*). There are thirteen species of otter worldwide although only one, the Eurasian otter (*Lutra lutra*), is native to Britain. Otters suffered a drastic decline in the 1950s primarily due to agricultural use of organochlorine pesticides polluting river systems, which in turn reduced breeding success. Increased traffic has also impacted otter populations with an average of 60% of recorded otter deaths noted as road casualties (Woodroffe, 1994). Reintroduction programmes in the 1980s and 90s were very successful with catchments in Wales now considered to be reaching their carrying capacity for otters (Strachan, 2015).

2.1.1 Habitat Preference and Identification

Otters are semi-aquatic mammals and generally prefer riparian habitat, however, canals, lakes and coastal areas are also used (Parry *et al.* 2011) and they are known to travel overland between catchment areas and along river banks. Otters are solitary and territorial with large home ranges, generally depending on food availability. They require 1.0kg to 1.5kg of food per day, preferring eel (whose flesh is high in fat content and easy to catch), other fish and amphibians. However, they are opportunistic predators and will occasionally take crayfish, water vole, bats and waterfowl.

Otters are a crepuscular species which are most active at dawn and dusk, and so are rarely seen in the day. As such, it is often a search for otter field signs including spraints, anal jelly, footprints, slides, feeding remains and resting sites that establishes the presence of an otter population. Examples of evidence to look out for on site is detailed below:

- Otters (Photo 1) – rarely seen during the day and are often confused with mink. In comparison otters are larger and a lighter brown colour. Otters generally swim lower in the water so that only the ears, face and snout can be seen above the water. Spraints (Photo 2) - blackish colouration, contains visible fish bones and scales and is described as smelling faintly similar to jasmine tea. This is often found on elevated places such as stones, bridges, fallen trees and where watercourses converge);
- Footprints (Photo 3) – 5 toes with gap in front of a long heel;
- Resting sites (Photo 4) - holts, dens and couches; and
- Slides – depressions in vegetation where otters access water from the bank-side.

Photo 1: Eurasian otter



Source: Mott MacDonald Ltd.

Photo 2: Otter spraint



Source: Mott MacDonald Ltd.

Photo 3: Otter footprint



Source: Mott MacDonald Ltd.

Photo 4: Otter holt



Source: Mott MacDonald Ltd.

2.2 Water vole

Water voles are semi-aquatic rodents of the sub family Arvicolinae, along with all other voles, lemmings and muskrats. Their populations in England, Scotland and Wales are at the western edge of their natural range and have declined dramatically over the last century, in particular over the last 30 years. The species has been lost from almost 90% of the sites where it occurred in the last century, as a result of habitat loss and fragmentation, and predation by the introduced mink as this spreads across the UK. The remaining populations are often fragmented, which threatens their long-term survival.

2.2.1 Habitat Preference and Identification

Water voles are generally found in slow-flowing, narrow watercourses about 1.0m in depth which do not fluctuate throughout the year. They are normally found along mud or clay banks, with plenty of bank side emergent vegetation needed for burrowing, feeding and coverage.

Water voles live in colonies, usually stretched out along the watercourse as a series of territories. They live in a system of burrows in waterside banks and utilise only a narrow strip of land along the water's edge (Photo 5). The burrows are dug by the voles biting the earth with its incisors and pushing the soil behind with its feet. The burrows comprise many entrances above and below the water, with interconnecting tunnels, food storage and nesting chambers. Above ground, their activity is largely confined to runs in dense vegetation within two metres of the water's edge. Discrete latrine sites along the runs and water's edge mark territory boundaries (Photo 6).

Water voles do not hibernate, but they do spend long periods within their nest chambers in the winter and there may be little sign of above ground activity. Although predominantly diurnal, males in particular, become more nocturnal in winter.

Photo 5: Water vole burrow



Source: Mott MacDonald Ltd

Photo 6: Water vole latrines



Source: Mott MacDonald Ltd

3 Legislation

3.1.1 Otter

Otters are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017. The Conservation of Habitats and Species Regulations 2017 implements the European Union's 'Habitats Directive' (Council Directive 92/43/EEC (a) on the Conservation of Natural Habitats and of Wild Fauna and Flora) in Great Britain.

The Act and Regulations make it an offence to:

- Intentionally or deliberately kill, injure or take an otter;
- Intentionally or deliberately damage, destroy or obstruct access to any structure or place used for shelter or protection by an otter;
- Intentionally or deliberately disturb an otter while it is occupying a structure or place which it uses for that shelter or protection;
- Deliberately disturb an otter in such a way as to be likely to significantly affect the local distribution or abundance of otters or the ability of any significant group of otters to survive, breed, rear or nurture their young;
- Possess or control (live or dead animal, part or derivative); and
- Sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative).

3.1.2 Water vole

Water vole are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

The Act makes it as offence to:

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

4 Ecological Baseline

4.1 Desktop Survey Results

There are twenty-seven records of otters within 2.0km with the nearest located approximately 0.4km away from the survey area (South East Wales Biodiversity Record Centre, 2017).

Otter surveys were undertaken within the footprint of the M4 Corridor around Newport scheme in 2014 and 2015. Otter presence was noted in Monks' Ditch, immediately south of the site. A single reed to the south-east of the site, approximately 1.5km away also confirmed otter presence (Arup, 2014; RPS, 2015).

4.2 Otter and Water Vole Survey Results

A total of sixty-five waterbodies were surveyed by Mott MacDonald Ltd in 2017 and 2018 for otter.

No evidence of otter was observed during the surveys or using the camera traps. However, Monks' Ditch is a designated SINC for otters. On this basis, whilst it is considered highly unlikely that any holts, couches or other resting places for otter are present on site, it remains possible that otters could make occasional use of the section of Monks' Ditch for foraging or commuting.

A total of sixty-five waterbodies were surveyed in 2017 and 2018 for water vole. No evidence of water vole was observed during the surveys. Potential evidence of water vole was found including burrows, two potential feeding stations and footprints. No other signs which could confirm presence of this species, such as latrines or sightings of water vole, were recorded during the survey work.

According to the Water Vole Mitigation Handbook (Dean *et al.*, 2016) presence of water vole droppings is the only field sign that can be reliably used on its own. However, due to the multiple examples of potential signs found within the site (and within 250.0m of the site), the known population of water voles in the area and the suitability of the habitat to support this species (especially to the north of the site), it is considered appropriate to treat the evidence as indicating likely presence of water voles on a precautionary basis for the purposes of the assessment and recommendations.

5 Proposed Safeguards

The following safeguards are to be followed when undertaking construction works:

5.1 Update Check

Otter and water voles are mobile animals and can move into new territories. As otter have been recorded close to the site and water voles have potentially been recorded on the site, a pre-works walkover should be undertaken approximately 12 weeks prior to any works being undertaken. The walkover will establish if there is any new evidence on site of otter or water vole which may be affected by the works, in order to inform the avoidance and mitigation measures required.

In the unlikely event that an active water vole burrow is recorded during the pre-works walkover within the area to be affected by the works, an ecologist should be contacted to advise on suitable avoidance measures or NRW should be consulted and mitigation will be agreed prior to works commencing on site.

In the unlikely event an active otter holt or couches are identified within the working area, an ecologist should be contacted to advise on avoidance measures or NRW should be consulted to agree whether a licence would be required for disturbance.

5.2 General Construction Safeguards

The following measures are proposed:

- Prior to the start of all works, a tool box talk (Appendix A) will be provided to the contractors by a qualified ecologist. The briefing will raise awareness of the potential use of the site by otters and water vole, their respective legislative protection, and will provide a mechanism for the understanding and reporting of any significant sightings;
- Prior to any works being undertaken, a suitably qualified ecologist will undertake an update check survey as described in Section 5.1;
- Dependant on the results of the update check, the site ecologist may require the use of hand tools only in sensitive areas;
- All works within 30.0m of Monks' Ditch will be supervised by a qualified ecologist;
- There will be a slow start up of equipment to gradually increase levels of noise and vibrations onsite, as sudden noises can be more disturbing;
- Some equipment can be used with hoods, doors or sleeves to reduce noise levels, these should be used wherever possible and particularly at night;
- To avoid entrapment or harm to otters and/or water vole, excavations should be covered when works are not taking place. Where deep excavations are made, a mammal ladder should be installed to allow otters and/or water vole a means of escape from the trench;
- Any temporarily exposed open pipes should be capped to ensure that otters and/or water vole cannot enter them;
- Additional measures should be implemented to negate possible impacts to otters or water voles including standard good practice, such as storage of materials and liquids away from watercourses and prevention measures to avoid accidental spillages etc.;
- Otters are a crepuscular species which are mainly active during dawn and dusk. As such, if night work is essential this should avoid unnecessary disturbance by ensuring that the height

of lighting columns are as low as possible. Lighting hoods, cowls and shields should be utilised to focus light into the working areas and away from the surrounding environment and particularly away from watercourses;

- Where possible, choose the machines and routes for works carefully so as to minimise sediment run-off which might negatively impact upon otter and/ or water vole habitat. The use of temporary culverts may help to avoid sediment entering a watercourse; and
- No watercourses will be blocked and no works are to be undertaken to Monks' Ditch itself.

In addition, no heavy machinery or ground works should be undertaken in the vicinity of other mammal burrows such as fox or rabbit without having implemented control measures to ensure the animals are not present to avoid committing an offence under the Wild Mammals (Protection) Act 1996.

6 References

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Dean, M., Strachen, R., Gow, D. & Andrews, R. (2016). The Water Vole Mitigation Handbook. (*The Mammal Society Mitigation Guidance Series*). The Mammal Society, London.

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Strachan, R. (2015). Otter survey of Wales 2009-10. Natural Resources Wales. Available URL:

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Appendices

A. Toolbox Talk

12

A. Toolbox Talk

TOOLBOX TALK: **Otters**

Otters will use a variety of habitats for shelter and protection including under tree roots, boulders or old rabbit burrows. These can be 10's of meters from a watercourse.

Evidence suggests that otters may be present within the vicinity of the proposed work.

LEGISLATION

Under UK law (*Wildlife and Countryside Act 1981 and Conservation of Habitats and Species Regulations 2017*) it is an offence to:

- Intentionally kill, take or injure an otter;
- Possess or control an otter;
- Intentionally or recklessly cause damage, destruction or obstruct access to any structure or place used by an otter for shelter or protection;
- Intentionally or recklessly disturb an otter.

Penalties for breaking the law can include **large fines**, **imprisonment** and the **seizure of equipment**.

WHAT TO DO IF YOU SEE AN OTTER

If at any time during the works an otter is seen, all works should stop (when safe to do so) and the Ecologist must be contacted immediately. If there is any doubt contact them.

When calling, leaving a message is insufficient - you must speak directly to an ecologist. They will then be able to advise on a legal and appropriate course of action.



If there is any suspicion that otters are present within the works area, STOP ALL WORKS and contact your Project Environmental Representative IMMEDIATELY on:

DO NOT RISK BREAKING THE LAW

TOOLBOX TALK: Water Vole

The water vole is sometimes confused with a rat but are generally smaller, with a blunter nose, rounder body and less obvious short round ears. Water voles are found in slow moving rivers streams ditches and around lakes, reed-beds, marshes and ponds.

Water voles can establish their burrows several meters from a water course and can be easily confused with rat burrows.

Evidence suggests that water voles may be present within the vicinity of the proposed works.

LEGISLATION

Under UK law (Wildlife and Countryside Act, 1981) it is an offence to:

- intentionally or recklessly cause damage, destruction or obscure access to any structure or place used by a water vole for shelter or protection;
- intentionally or recklessly disturb a water vole while occupying such a place; or,
- intentionally kill or injure a water vole.

Penalties for breaking the law can include **large fines**, **imprisonment** and the **seizure of equipment**.

If at any time during the works a water vole or possible water vole burrow is seen, all works likely to cause damage or destruction to a burrow must stop and the Ecologist must be contacted immediately.

Call _____. Leaving a message is insufficient - you must speak directly to an Ecologist. The Ecologist will then be able to advise on a legal and appropriate course of action.

Examples of Water Vole Burrows



If there is any suspicion that water voles are present within the works area, STOP ALL WORKS and contact the site Ecologist IMMEDIATELY on:

**DO NOT RISK
BREAKING THE LAW.**

D.4 Reptile Method Statement (Document number: 367590-WTD-CAR-2663)



Llanwern Rail Facilities - Phase 1 Planning

Reptile Method Statement

September 2018

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Llanwern Rail Facilities - Phase 1 Planning

Reptile Method Statement

September 2018

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	24/09/18	Z Costas-Michal	C Williams	E C Probert	Draft Issue - for TFW only
B	28/09/18	Z Costas-Michal	C Williams	E C Probert	Pre-Application Consultation Issue

Document reference: 367590-WTD-CAR-2663

Information class: Standard

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1 Introduction

1.1 Project Description

Mott MacDonald (MM) has been commissioned by Transport for Wales (TfW), on behalf of Welsh Government, to prepare and submit a planning application, seeking full planning permission for the design and construction of a 1.6km long Major Events Stabling Line (MESL) on land adjacent to the existing Tata Steelworks Service Lines in Llanwern, South Wales. This is Phase 1 of the Llanwern Rail Facilities Programme.

The MESL will be used for stabling of rolling stock for major events in the area, to enable flexibility for future train requirements, and proving of trains prior to use on the rail network. The MESL will be electrified in a future phase of work. This proposed 1.6km length of MESL to the west of Monks' Ditch was formerly known as Option 6a.

The wider Llanwern Rail Facilities Programme will include an extension of the MESL by circa 2.4km east (to achieve a total length of circa 4km), electrification of the MESL, a new Llanwern railway station and passenger line (including Park & Ride and footbridge), and connections to the South Wales Main Line (Relief Lines). The further phases of the project will be the subject of a subsequent planning application.

- The key parameters for the Scheme are listed below:
- Whole Site area is 3.1 hectares. This land is contained within the red line boundary shown on the Site Location Plan (Drawing number 367590-MMD-48-XX-DR-C-0001); and
- The Site length is approximately 1.6km long and 19m wide.

1.2 Scope of Works

The General Arrangement drawings (Drawing numbers 367590-MMD-48-XX-DR-C-0002 to 367590-MMD-48-XX-DR-C-0005) demonstrate the project scope which includes the design and construction of the following:

- A single track stabling line (MESL) circa 1.6km long;
- Associated earthworks and landscaping; and
- Drainage and other engineering works.

In order to obtain full planning permission for Phase 1, we have carried out the outline design and technical assessment of the above scope, as well as multiple assessments in terms of ecology, environment, heritage and archaeology.

1.3 Site Location

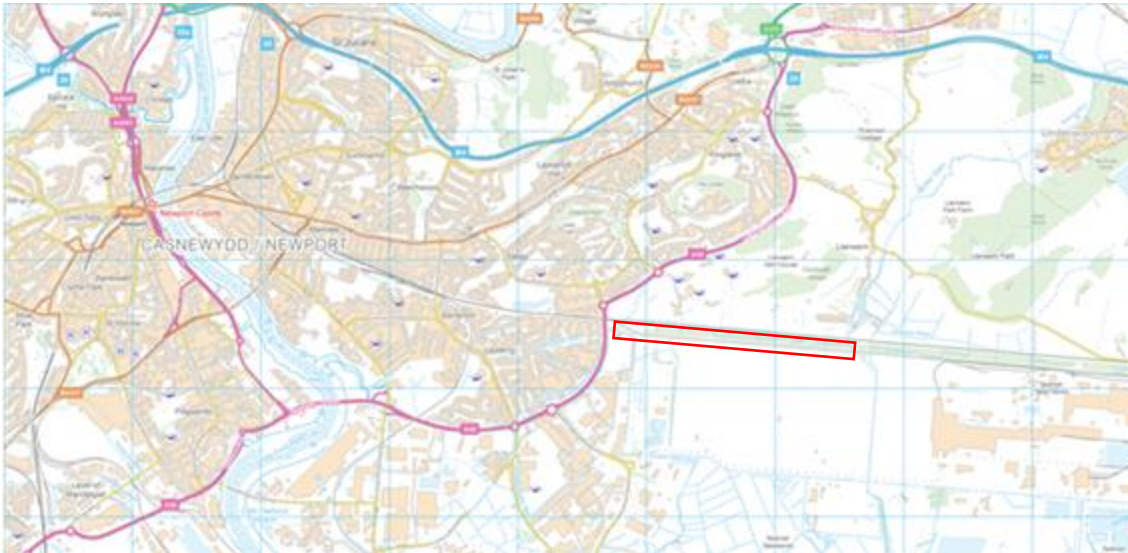
The proposed rail development Site is located approximately 8 miles east from the centre of Newport, South Wales (Figure 1.1).

The Site is aligned roughly west – east and bordered by the existing South Wales Mainline to the north and the Tata Steelworks to the south. Along the southern boundary of the steelworks site runs the A4810 which links the M4 from junction 23A at Magor with the A48 at Liswerry (a predominantly residential suburb on the south-eastern side of Newport). The Site is more widely bordered by the M4 which runs approximately two and a half miles to the north and the Severn

Estuary which lays approximately three miles to the south. The Gwent Levels to the south is a significant area of wetlands.

The existing South Wales Mainline passes north of the proposed site and provides opportunity for transport links for both passengers and freight.

Figure 1.1: Proposed Location Plan



Source: OS Open Data

1.4 Scope of the Report

This report sets out an ecological method statement for the protection of reptiles during the construction works at the site. The objectives of this report are to:

- Detail the assessment of the likely presence of reptiles within the site;
- Identify the proposed works which could impact reptiles;
- Set out an appropriate protocol to be followed by all contractors to ensure ecology is considered; and
- Provide appropriate site-specific mitigation safeguards and working methodology to protect reptiles during all works.

2 Ecology Context

2.1 Ecology Context

Generally, reptiles are active during the day from March to early October. They hibernate through the winter season from October to March, and mating takes place between April and July with young born between June and October (Edgar *et al.*, 2010). Reptiles are ectothermic which means they rely on the external environment to maintain their body temperatures. As such, they have variable body temperatures and it influences many aspects of reptilian biology, including habitat requirements (Edgar *et al.*, 2010). They are usually active when temperatures are above 10°C, when there is no precipitation and if the wind strength is negligible to moderate. They will usually move into colder microclimates if temperatures exceed 20°C and will find shelter if there is precipitation and/or if the wind strength is too high (Froglife, 1999).

All six species of British reptile have been identified as being of conservation concern due to the decline in the amount of suitable habitat. Identification of the four common British reptiles, their habitat requirements and activity details including their dispersal distances are detailed below. Within the site, slow-worms and grass snakes are known to be present.

Sand lizards and smooth snakes have been discounted due to lack of suitable habitat within the location and distance from known populations (Edgar *et al.*, 2010) and are no longer considered in this method statement.

2.2 Identification

2.2.1 Slow-worms (*Anguis fragilis*)

Slow worms are actually lizards, but have a snake-like appearance, as they have no legs and are clad in smooth shiny scales (Photo 1) and typically grow up to 400mm in length. Males are various shades of grey or brown with occasional blue spots. Females are brown or copper in colour with dark brown flanks and a dark vertebral stripe. Young slow-worms are light silver or gold in colour with darker more defined flanks and vertebral stripe. They can be found on heathland, lower altitude moorland, most types of grassland (especially chalk grassland and rough grassland with bramble scrub), woodland glades and rides, hedgerows and disused quarries (Edgar *et al.*, 2010). They can also be found on embankments including railway, road and canal (Edgar *et al.*, 2010). They are mainly diurnal but can forage after dark on warm evenings. They primarily live underground, underneath objects, within vegetation litter and grassland tussocks. They do not move long distances and territories are likely to only extend to several hundred square metres. They hibernate in communities and often undertake annual migration movements, but the distances are smaller compared to snake migration distances (Edgar *et al.*, 2010).

2.2.2 Grass Snakes (*Natrix natrix*)

Adult grass snakes are usually between 700mm and 1,000mm long. Olive green, brown or grey body, with black bars down the sides. Usually has a yellow or white “collar” behind the head (Photo 2). Often associated with wetlands, but can also be found in heathland, grasslands, open woodlands, farmland, gardens and allotments. Can also be found on brownfield sites including railway corridors, disused quarries, along road and canal corridors. Are often not reliant on a single site providing the necessary habitat for hibernation, feeding and egg-laying. Warm, humid, decomposing organic material is required for egg-laying. Largely diurnal although they

are known to be active at night during warm periods, especially in and around ponds. Individuals disperse from hibernation sites relatively rapidly and may move over several kilometres during the active season. May migrate through relatively poor-quality habitat to reach favoured egg-laying, foraging or hibernation areas (Edgar *et al.*, 2010).

Photo 1: Slow-worm



Source: Mott MacDonald Ltd

Photo 2: Grass snake



Source: Mott MacDonald Ltd

2.2.3 Common Lizards (*Zootoca vivipara*)

Common lizards typically grow up to 130mm long and are various shades of brown with small bars or spots (Photo 3). Young lizards are black or dark copper in colour. They can be found in a range of different habitats, including grassland, woodland edges, brownfield sites, heaths and dunes (English Nature, 2004). Often seen on linear features including railway embankments and stone walls (English Nature, 2004). They are diurnal and travel only up to a few tens of metres as lizards often share the same basking areas and hiding places. Most dispersal is through the movements of juveniles, with rapid colonisation of new habitat (Edgar *et al.*, 2010).

2.2.4 Adders (*Vipera berus*)

Adders can grow up to 550mm long and are usually grey, rust or sandy-coloured, with a dark coloured zig-zag stripe all the way along their body (Photo 4). Found on heaths, moors, meadows, woodland glades and urban fringe sites. Mainly a diurnal species but may also be active at night during very hot weather. They often use separate spring breeding and summer foraging areas as they prefer wetter habitats for the summer, which can be up-to two kilometres apart. They return to traditional hibernation sites in late summer which are often where the females give birth (Edgar *et al.*, 2010).

Photo 3: Common lizard



Source: Mott MacDonald Ltd.

Photo 4: Adders



Source: Mott MacDonald Ltd

3 Legislation

3.1 Legislation

Under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), only parts of sub-section 9(1) and all of sub-section 9(5) apply to the more common species slow worm, common lizard, adder and grass snake and make it illegal to:

- Deliberately or intentionally kill, capture or injure; and
- Sell, barter, exchange, transporting for sale or advertising to sell or to buy them.

Section 9 of the Act states that activities which could result in the death or injury of the more common species are not licensable and rely on the defence that any such outcome is the incidental result of a lawful operation and could not reasonably have been avoided.

4 Ecological Baseline

4.1 Desktop Survey Results

Two records of reptiles were identified within 2.0km of the survey area (South East Wales Biodiversity Records Centre). These included; one record of two individual grass snakes submitted in 2016 approximately 1.2km away from site and one record of a common lizard approximately 1.7km away from the survey area.

A review of the M4 Corridor around Newport data has identified the presence of both adult and juvenile grass snakes to the south of the survey area.

4.2 Reptile Survey Results

Presence/likely absence surveys confirmed that slow-worms and grass snakes are using the survey area. A peak count of 2 adult grass snakes were recorded along with 10 adult slow-worms. Grass snakes were therefore originally assigned as having a 'low population class' and slow-worms as a 'good population class' according to Froglife (1999) Advice Sheet 10. It is considered that slow-worm and grass snake populations within the site are breeding as sub-adults and juveniles were recorded.

According to the Guidelines for the Selection of Wildlife Sites in South Wales (Gwent Wildlife Trust, 2004), any site supporting a good population of any reptile species should be considered for selection. This guidance also states that recording several individuals of a species on half or more of the survey occasions should be taken to indicate the presence of a 'good' population. Recording of several individuals on every survey occasion (or nearly every occasion) may be indicative of an exceptional population. As life stage (e.g. adult or juvenile) is not accounted for in this guidance, following a precautionary approach, the population estimate for grass snake may be elevated to 'good'.

5 Proposed Safeguards

5.1 Proposed Safeguards

5.1.1 Prior to Works

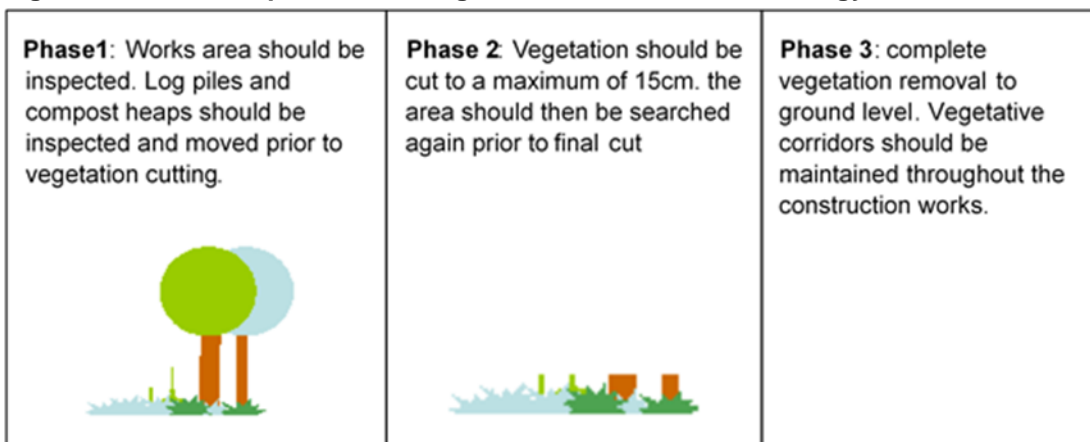
Prior to the start of all works, a tool box talk (Appendix A) will be provided to the contractors by a qualified ecologist. The briefing will raise awareness of the potential use of the site by reptiles, their legislative protection, and will provide a mechanism for the understanding and reporting of any significant sightings.

5.1.2 Sensitive Vegetation Clearance Methodology

Vegetation clearance should be undertaken between April and the end of October, whilst reptiles are active, following the below sensitive vegetation clearance methodology:

- An ecologist will be present on site during the vegetation clearance works;
- All areas to be affected will be finger-tip searched by the ecologist;
- No clearance works are to occur until areas have been confirmed clear of any reptiles;
- After any areas of suitable terrestrial habitat are searched, if vegetation is longer than 150mm then the vegetation will be reduced in height using hand held tools on a two-stage cut basis (Figure 2).
 - Areas to be affected by the proposed works will be cut to 150mm initially, hand searched by the on-site ecologist; and
 - Then cut to ground level.

Figure 2: Visual Interpretation of Vegetation Clearance Methodology



Source: Mott MacDonald Ltd.

- If any reptiles are found during the works they should be removed by hand to areas away from the working area, such as scrub or retained tall ruderal habitat that will not be affected by the works;
- All arisings from cut vegetation are to be removed using a rake or blower outside of the works area; and

- Should cleared vegetation start to regrow before the proposed works are undertaken, then this will need to be maintained at ground level. Any further vegetation clearance required will be undertaken in line with the above detailed methodology.

5.1.3 Sensitive Hibernacula/ Refugia Clearance Methodology

- Where areas of potential refugia/ hibernacula are identified (including but not limited to log piles) and *cannot be avoided*, these will be dismantled by hand by the on-site ecologist; and
- The on-site ecologist will advise on a suitable area for which the hibernacula/ refugia can be re-instated or hibernacula will be moved outside the works area.

5.1.4 Sensitive Ground Clearance Methodology

- Once any vegetation and refugia have been sensitively cleared, the topsoil should be stripped during suitable weather conditions. This should be performed by careful use of an excavator with a toothed bucket under the supervision of a licensed ecologist; and
- Once it has been deemed clear of reptiles, the ground should be compacted down to render it unsuitable for reptiles to use as a refuge or resting place.

5.1.5 Good Practice Procedures

- No equipment will be stored in suitable reptile habitat as identified by the site ecologist. This will reduce the risk of stored equipment being used as refugia by reptiles. Should this be required it is recommended that these are situated within the designated work compound;
- All stored stone and subsoil materials that need to be stored overnight will be compacted down to render it unsuitable for reptiles to use as a refuge or resting place;
- Any excavations should be covered over on the same day wherever possible; and
- As a preventive measure for any excavations, suitable mammal ladders will be left overnight to aid the dispersal of amphibians, reptiles and mammals. In the morning visual checks of these areas will be undertaken for the presence of any reptiles, amphibians or mammals. If any animal is found, the on-site ecologist will be contacted.

6 References

Edgar, P., Foster, J. and Baker, J. (2010). Reptile Habitat Management Handbook. Amphibian and Reptile Conservation, Bournemouth.

English Nature (2004). Reptiles: guidelines for developers.

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

South East Wales Biodiversity Records Centre (SEWBReC) (2017) *Biodiversity Information Search: Llanwern*

Appendices

A. Toolbox Talk

12

A. Toolbox Talk

TOOLBOX TALK: COMMON REPTILES

Britain supports 4 species of common reptile which are found throughout a number of habitat types sometimes in large numbers within grassland, scrub and woodland. Evidence suggests that there is potential for common species of reptile to be present within the site of proposed works.

LEGISLATION

All native reptiles in Britain are protected under UK law (*Wildlife and Countryside Act 1981*).

This protection makes it **illegal to intentionally kill or injure any native species of common reptile.**

As there is potential for reptiles to be within the site of proposed works, causing injury and or death to any reptile onsite could be identified as intentional by a UK court.

Penalties for breaking the law can include **large fines, imprisonment and the seizure of equipment.**

WHAT TO DO IF YOU SEE A REPTILE

If a reptile is seen, any works likely to cause injury/death (such as excavation, movement of machinery, cutting of vegetation etc.) must stop **when safe to do so** and the ecologist or environmental co-ordinator contacted to determine the best course of action.

When calling, leaving a message is insufficient - you must speak directly to an ecologist or environmental co-ordinator. They will then be able to advise you on the appropriate course of action.

At no time should you purposefully approach or attempt to handle a reptile.

Reptiles are fragile and incorrect handling can cause injury/death. **In addition, the UK supports a venomous species (the Adder), a bite from which is life threatening and is likely to require the administration of anti-venom at a hospital.**



**If a
reptile has been
seen on site, STOP ALL
WORKS LIKELY TO
CAUSE INJURY/DEATH
TO REPTILES and contact
the ecologist,
IMMEDIATELY on**

**DO NOT RISK BREAKING
THE LAW**

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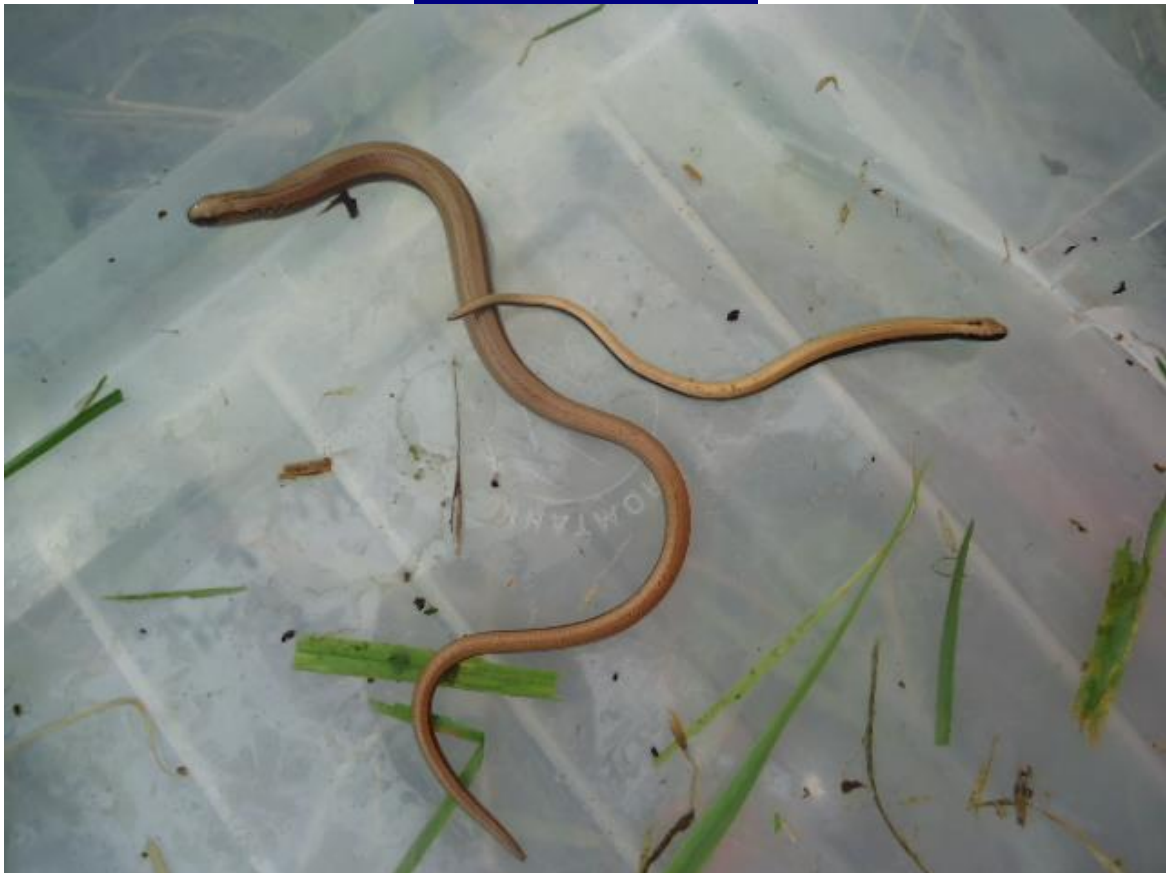
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MOTT
MACDONALD

COMMON LIZARD



SLOWWORM



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**MOTT
MACDONALD**

GRASS SNAKE



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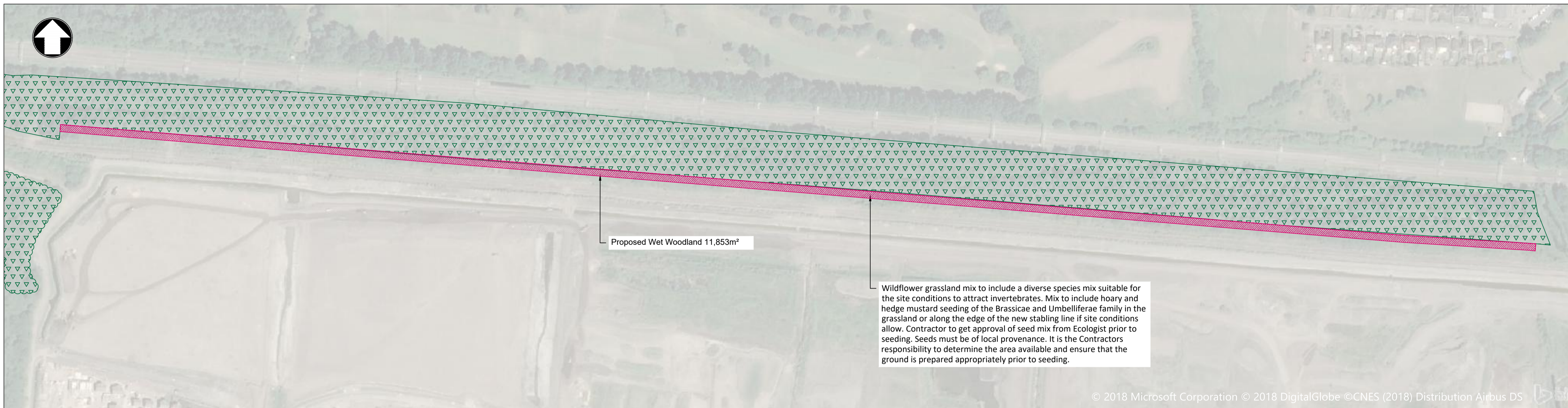
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**MOTT
MACDONALD**

ADDER



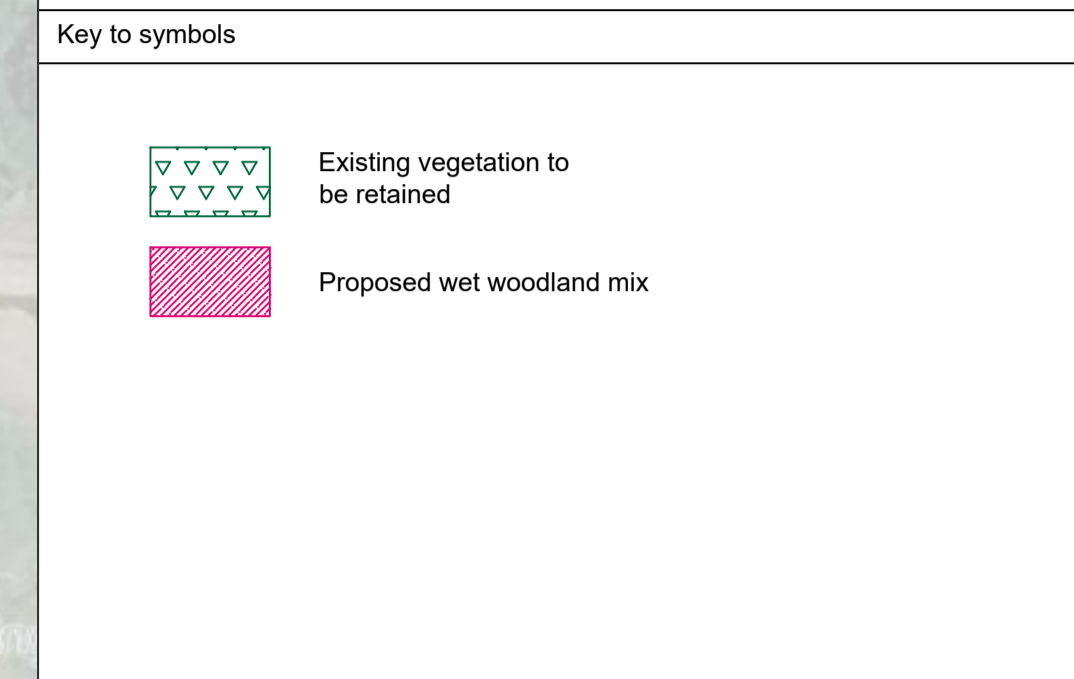
E. Planting Plan Drawings



Notes

- Do not scale any information from this drawing.
- The drawing has been developed to meet the extent of landscape mitigation as per the NRW requirements.
- Print in colour.
- See drawing number 367590-MMD-48-XX-DR-C-0201 for additional planting areas.

* Pit planted
 ** Single softwood stake
 *** Spiral rabbit guard



Species	Size	Location	%Mix	Number
Acer campestre	1+1 40/60cm height, bare root, notch planted, cut back to 30cm height***	Woodland Core	3	1030
	1+2 175/200cm height, feathered, bare root***	Woodland Core	1	343
Acer pseudoplatanus	6-8cm girth, feathered, bare root***	Woodland Core	1	343
	1+1 60/80cm height, bare root, notch planted ***	Woodland Core	1	343
Betula pendula	6-8cm girth, feathered, bare root***	Woodland Core	1	343
	1+1 125/150cm height, transplant, bare root***	Woodland Core	2	686
Carpinus betulus	1+2 200/250cm height, transplant, feathered, bare root***	Woodland Core	1	343
	6-8cm girth, 25 Litre container, feathered***	Woodland Core	1	343
Castanea sativa	1+1 60/80cm height, bare root, notch planted ***	Woodland Core	5	1717
	6-8cm girth, feathered, bare root***	Woodland Core	1	343
Corylus avellana	40/60cm height, bare root, notch planted, cut back to 30cm height***	Woodland Core	18	6180
	1+1 80/100 height transplant, bare root, cut back to 30cm height***	Woodland Core	2	686
Crataegus monogyna	40/60cm height, bare root, notch planted, cut back to 30cm height***	Woodland Core	18	6180
	15/20cm height, 9cm container, notch planted	Woodland Core	1	343
Hedera helix	15/20cm height, 9cm container, notch planted	Woodland Core	1	343
	1+1 60/80cm height, bare root, notch planted ***	Woodland Core	2	686
Ilex aquifolium	40/60cm height, 2 Litre container***	Woodland Core	2	686
	40/60cm bare root, notch planted, cut back to 30cm height	Woodland Core	1	343
Lonicera periclymenum	1+2 80/100cm height, transplant, bare root***	Woodland Core	6	2060
	6-8cm girth, feathered, bare root***	Woodland Core	4	1375
Malus sylvestris	6-8cm girth, feathered, bare root***	Woodland Core	4	1375
	1+1 60/80cm height, bare root, notch planted ***	Woodland Core	3	1030
Prunus avium	1+2 125/150cm height, transplant, feathered, bare root***	Woodland Core	2	686
	6-8cm girth, standard, bare root***	Woodland Core	1	343
Pinus sylvestris	2+2 40/60cm height, bare root, notch planted***	Woodland Core	4	1375
	125 - 150cm height, feathered, hessian root balled***	Woodland Core	3	1030
Quercus robur	1+2 100/125cm height, transplant, bare root***	Woodland Core	7	2403
	1+2 150/175cm height, transplant, bare root***	Woodland Core	2	686
Taxus baccata	6/8cm girth, feathered, hessian root balled***	Woodland Core	1	343
	2+2 30/40cm height, bare root, notch planted***	Woodland Core	2	686
Total			100	34330

Species	Size	Location	%Mix	Number
Acer campestre	1+1 40/60cm height bare root, notch planted, cut back to 30cm height***	Woodland Edge	3	538
	1+2 175/200cm height, feathered, bare root***	Woodland Edge	1	180
Betula pendula	1+1 125/150cm height, transplant, bare root***	Woodland Edge	4	718
	1+2 200/250cm height, transplant, feathered, bare root***	Woodland Edge	2	359
Corylus avellana	40/60cm height, bare root, notch planted, cut back to 30cm height***	Woodland Edge	30	5380
	1+1 80/100cm height, transplant, bare root, cut back to 30cm height***	Woodland Edge	20	3587
Crataegus monogyna	40/60cm height, bare root, notch planted, cut back to 30cm height***	Woodland Edge	10	1794
	40/60cm height, bare root, notch planted, cut back to 30cm height***	Woodland Edge	5	896
Rosa canina	40/60cm height, bare root, notch planted, cut back to 30cm height	Woodland Edge	1	180
	1+2 80/100cm height, transplant, bare root***	Woodland Edge	5	896
Malus sylvestris	6-8cm girth, feathered, bare root***	Woodland Edge	2	359
	40/60cm height, bare root, notch planted, cut back to 30cm height	Woodland Edge	10	1794
Prunus spinosa	1+1 60/80cm height, bare root, notch planted, cut back to 30cm height***	Woodland Edge	2	359
	40/60cm height, bare root, notch planted, cut back to 30cm height	Woodland Edge	5	896
Salix caprea	1+1 60/80cm height, bare root, notch planted, cut back to 30cm height***	Woodland Edge	2	359
	40/60cm height, bare root, notch planted, cut back to 30cm height	Woodland Edge	5	896
Viburnum lantana	40/60cm height, bare root, notch planted, cut back to 30cm height	Woodland Edge	5	896
			100	17936
Total			100	2863

LLANWERN PLANTING NOTES

General

Prior to planting and/or excavation, the Contractor must establish the position and nature of all services. Carefully hand dig in the vicinity of underground service runs. The Contractor must apply for and obtain all consents and licences from statutory undertakers as necessary. Any damage caused to service runs by the Contractor shall be made good at his own expense.

All bare root and rootballed material shall be planted between 31st October and 31st March, or in accordance with the Supervising Officer's instructions.

All container grown material shall be planted between 30th September and 30th April, or in accordance with the Supervising Officer's instructions.

The Supervising Officer reserves the right to suspend any preparatory or planting work during adverse weather conditions or when the ground is waterlogged or frozen, avoiding frosts and excessively dry, cold and windy conditions. Ensure soil is sufficiently dry when excavating and moving to avoid damaging its structure. Plant material delivered in a frozen condition will not be accepted. Roots are to be protected at all times, from lifting in the nursery until planting out on site.

Plant supply

All plants shall be supplied to the relevant parts of BS 3936 Parts 1 (1992) and 4 (1984). Stock shall be materially undamaged, sturdy, healthy and vigorous, of good shape and without elongated shoots, and free from pests and diseases, discoloration, weeds and physiological disorders. Plants shall have been grown in a suitable environment and hardened off. The root systems shall be to the requirements of the National Plant Specification and balanced with the branch system.

All container grown material shall have been grown in the container at least one full growing season prior to delivery and show substantial new root growth, holding the planting material in place but without signs of being pot-bound or waterlogged.

Lifting, packaging and transporting shall be to CPSE (Committee for Plant Supply and Establishment) 'Handling and Establishing Landscape Plants' (obtainable from the Horticultural Trades Association) Part I, Part II, and Part III, Paragraphs 1.3.3 - 1.3.6, 3.0 and 4.0.

The Contractor shall identify, reject and replace with suitable material, any plants misshapen or struggling to survive because of damage prior to, or at planting.

Tree and shrub planting

Planting shall be carried out between November and March, but not during periods of frost or drying winds.

Prior to planting cut all brambles, on site and on boundaries, to ground. Do not apply herbicide to the existing plants. Remove the arisings and dispose of all material off-site.

Spread granular slow release fertiliser over all woodland planting areas prior to planting at the manufacturer's recommended rates. Do not apply fertiliser to retained grassland areas.

Plant numbers should be calculated at a density of 1 plant per 1m2 for woodland and woodland edge, and 1 plant per 5 m2 for low density planting. Plant locations are to be offset by 1,500mm from all boundaries and adjacent features.

Planting shall be undertaken in a random manner, avoiding equal spacings and grids. All plants are to be planted in species groups of 3 apart from Hedera helix and Lonicera periclymenum which should be planted immediately adjacent to trees that are staked to provide a structure for the plant to climbing.

Prior to removal from containers, all container plants shall be thoroughly watered and allowed to stand for a minimum of 30 minutes.

All roots of bare rooted material shall be thoroughly immersed in an anti-desiccant solution such as Algimure Root Dip or similar.

Planting shall be either in pits or via notches as specified. Where notch planted, the entire root system must be covered, and completely firmed and consolidated at planting.

Where plants are to be pit planted, holes shall be dug of sufficient size to take the entire root system without excessive bending of the roots. The base of each pit shall be broken up to a depth of 500mm.

Single tree stakes are to be provided for all feathered trees. Stakes shall be whole sections of softwood timber peeled and pressure treated in accordance with BS 4072, 50-75mm top dia., and of sufficient length to extend to 300mm above ground when driven firmly into the ground. Position on the windward side of the plant, and drive into the base of the pit after breaking up the bottom of the pit and before planting. Secure each plant using a single heavy-duty tree tie and spacer approximately 50mm from the top, secured with a nail if necessary. The tie should hold the tree in position securely enough to allow wind movement, but not so tightly it chaffs the bark.

All plants shall be centrally positioned and upright, with finished soil level matching that of the nursery, adequately firmed but not compacted. Damaged top or root growth shall be carefully cut back to live wood.

Pits shall be backfilled with 80% excavated topsoil and 20% organic material, not containing peat or peat-based material. Slow release fertiliser shall be incorporated into the mix, at the manufacturer's recommended ratios.

All plants must be watered to field capacity on completion, ensuring soil is completely firmed and consolidated, but not compacted, around roots.

Securely fix a 600mm grey or black spiral rabbit guard around every stem post planting, firmly rammed into the soil to prevent dislodging. Do not cut off excess guard on plants cut back to 300mm.

Apart from in glades, treat an area of 1,000mm radius around the base of each staked plant with a selective herbicide developed to treat grass, following the manufacturer's instructions. Remove all arisings including tags, poles, containers, wrappings, tapes and other packaging and dispose of off-site.

Stock proofencing

Fencing should be constructed in straight lines and be strained between strainer posts.

Strainer posts should be used at each end of the fence and at least every 100m (2 nets), at all changes of direction and sudden changes of gradient (especially at the bottom of dips/hollows).

Straining posts are to be dug in to a depth of at least 900mm, properly rammed, firmed (using stones where necessary) and struted in the line of the fence. Two struts per post should be used on changes of direction except on acute corners of under 90 degrees where a single strut bisecting the angle of turn may be used.

The point end of the strut should be housed approximately 75-100mm deep into the straining post at a height of 750mm above ground level. The bottom end should be dug into the ground and rest tight on a half stake driven into the ground or a large stone well bedded below ground level.

Intermediate stakes are to be driven into the ground to a minimum depth of 550mm at 2,700mm intervals, in line with the posts.

Netting should be properly strained and stapled. Staples to be placed on top, 3rd, 5th and bottom wires of the netting on each post. Staples must not be driven fully home on the intermediate posts in order to allow future repair and retensioning work. They are to be positioned diagonally to the grain of the wood.

Single strand wire should be barbed and be properly strained and stapled to the outside of the posts and stakes 125mm above the top of the netting. A second barbed wire above the first may also be used (optional). Use plain wire if adjoining a public right of way.

Fix an additional single strand wire or piece of netting to the bottom of the fence in hollows and dips. Alternatively gaps below the fence should be filled with site stone or soil to ensure that it is fully stock proof.

Fencing should not be strained or attached to gate posts, trees, shrubs or other structures.

Materials

- Timber must be round peeled softwood (not spruce) and pressure tanalised to BS 4072, or timber of equivalent quality and durability.
 - Straining posts 2,000mm x 120mm top diameter;
 - Struts 2,000mm x 100mm top diameter;
 - Intermediate stakes 1700mm x 65mm top diameter, pointed, and
 - Longer stakes may be needed in soft or uneven ground conditions.
- Wire must comply to BS 4102 and be galvanised to BS EN 10244-2:2001.
 - Line wire: 4mm (8 swg) plain mild galvanised wire;
 - Barbed wire: Two strand 2.5mm (12½ swg) mild steel galvanised 4-point barbed wire; and
 - Staples: 40mm x 4mm galvanised wire staples.

Netting: C8/80/15 galvanised pig netting Where horses are present use HT 13/122/8 horse netting.

Planting maintenance 60 months post planting

Undertake maintenance visits as necessary to maintain the works in a tidy and healthy condition.

Maintain an area of 1m radius grass free around the base of each staked plant with a selective herbicide developed to treat grass, following the manufacturer's instructions during the course of 60 months following planting.

Maintain planted areas free from rubbish and debris.

Water as necessary, without damaging or displacing plants or soil to promote healthy growth.

Where wind rocking or soil heave has occurred, straighten plant and lightly firm soil around without compacting.

Remove plant growth overhanging public access ways and weak, dead or damaged material. Prune back to healthy and strong buds or growth points between November and March. Prune healthy overhanging arisings in long lengths and leave neatly piled across the area. Remove all other arisings and dispose of off site.

Plants that have failed to thrive should be replaced with equivalent plants during the next planting season, between November and March. Replacements should match either size of adjacent or nearby plants of same species or match original specification, whichever is the greater size.

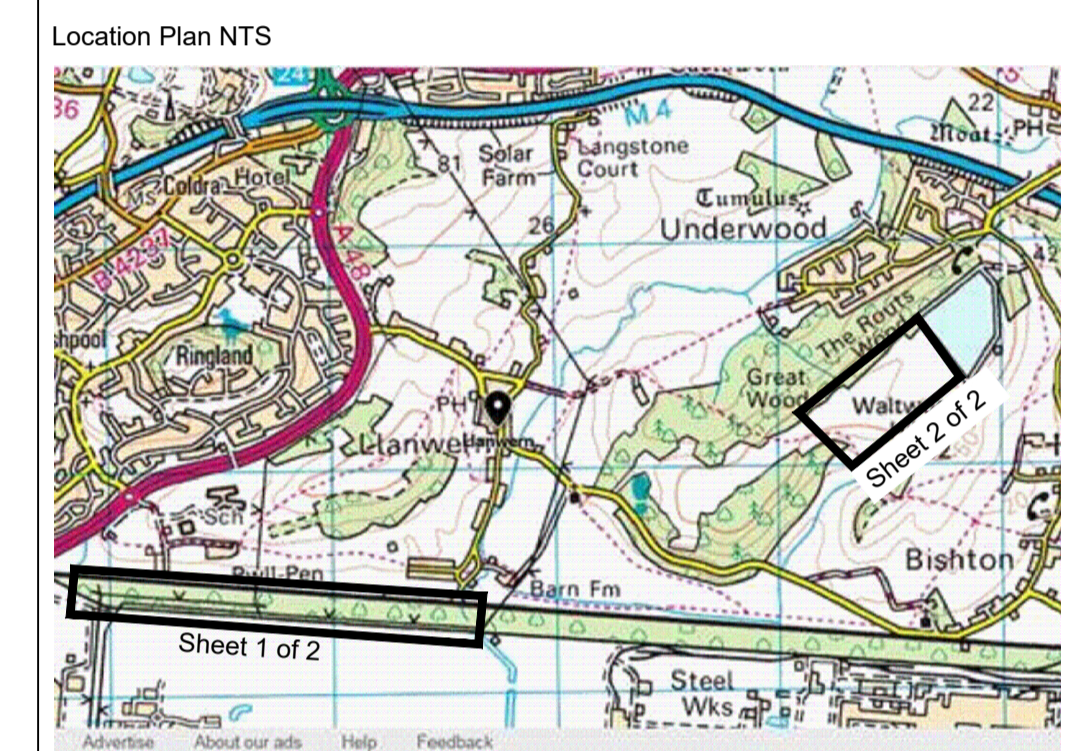
Check tree stakes, ties and guards, remove and replace as necessary those broken or damaged to maintain plant stability and protection. Remove stakes and ties if tree is self-supporting and in any case after five years. Remove rabbit guards after five years. Remove redundant stakes and tags and guards and dispose of off site.

Leave the works in a clean tidy condition.

Species	Size	Location	%Mix	Number
Salix alba	0/1 60/80cm height, bare root, notch planted, cut back to 30cm height***	Low Density Salix woodland	20	214
	0/1 150/175cm height, bare root**	Low Density Salix woodland	20	214
Salix caprea	200-250cm height, feathered, bare root***	Low Density Salix woodland	20	214
	1+1 60/80cm height, bare root, notch planted, cut back to 30cm height***	Low Density Salix woodland	40	428
Total			100	1070

Reference drawings

367590-MMD-48-XX-DR-C-0001 - Site Location Plan
 367590-MMD-48-XX-DR-C-0002 - General Arrangement Plan Sheet 1 of 4
 367590-MMD-48-XX-DR-C-0003 - General Arrangement Plan Sheet 2 of 4
 367590-MMD-48-XX-DR-C-0004 - General Arrangement Plan Sheet 3 of 4
 367590-MMD-48-XX-DR-C-0005 - General Arrangement Plan Sheet 4 of 4
 367590-MMD-48-XX-DR-C-0201 - Landscape Mitigation Plan Sheet 2 of 2
 367590-MMD-48-XX-DR-C-0300 - Proposed Track Drainage Sheet 1 of 2
 367590-MMD-48-XX-DR-C-0301 - Proposed Track Drainage Sheet 2 of 2
 367590/WTD/CAR/2650 - Llanwern On and Off Site Mitigation and Monitoring Plan



Rev	Date	Drawn	Description	Ch'kd	App'd
P2	02.10.2018	RT	Pre-Application Consultation	RM	DF
P1	28.09.2018	HW	First Issue	MB	DF

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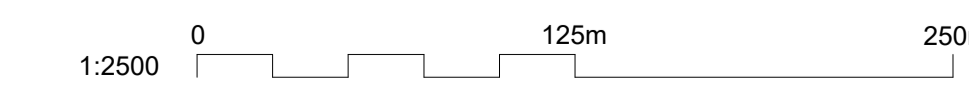
Client

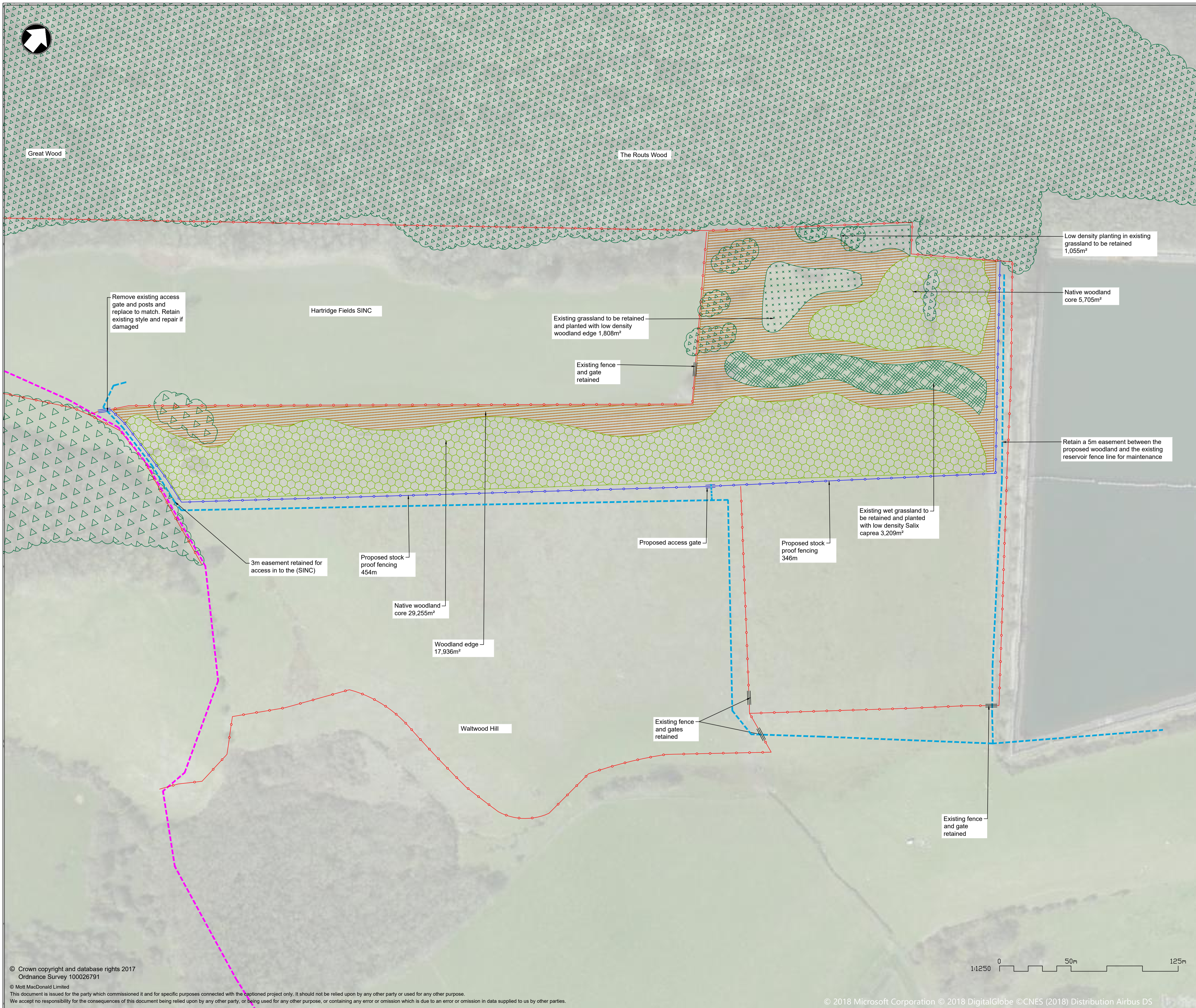
Transport for Wales
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Title

South Wales Metro - Task Order 048
 Llanwern Rail Facilities - Phase 1
 Landscape Mitigation Plan
 Sheet 1 of 2

Designed	H Wilcox	HW	Eng check	M Brewster	MB
Drawn	H Wilcox	HW	Coordination	J Bates	JB
Dwg check	M Jones	MAJ	Approved	D Francis	DF
Scale at A1	Status	Rev	Security		
As Shown	PRE	P2	STD		
Drawing Number	367590-MMD-48-XX-DR-C-0200				





Notes

- Do not scale any information from this drawing.
- The drawing has been developed to meet the extent of landscape mitigation as per the NRW requirements.
- Print in colour.
- See drawing number 367590-MMD-48-XX-DR-C-0200 for Planting notes.

Key to symbols

	Existing vegetation to be retained
	Proposed native woodland core mix
	Proposed native woodland edge mix
	Existing dry grassland retained
	Existing wet grassland retained
	Existing fence to be retained
	Proposed stock proof fence
	Llanwern Hill Circular PROW
	Proposed access and maintenance route to access Site of Importance for Nature Conservation (SINC) and proposed woodland planting
	Proposed access gate and gate posts to match existing, 7 bar tubular galvanised steel
	Existing access gate retained

Reference drawings

367590-MMD-48-XX-DR-C-0001 - Site Location Plan
 367590-MMD-48-XX-DR-C-0002 - General Arrangement Plan Sheet 1 of 4
 367590-MMD-48-XX-DR-C-0003 - General Arrangement Plan Sheet 2 of 4
 367590-MMD-48-XX-DR-C-0004 - General Arrangement Plan Sheet 3 of 4
 367590-MMD-48-XX-DR-C-0005 - General Arrangement Plan Sheet 4 of 4
 367590-MMD-48-XX-DR-C-0006 - Cross Sections
 367590-MMD-48-XX-DR-C-0200 - Landscape Mitigation Plan Sheet 1 of 2
 367590/WTD/CAR/2650 - Llanwern On and Off Site Mitigation and Monitoring Plan

Rev	Date	Drawn	Description	Ch'k'd	App'd
P2	02.10.2018	RT	Pre-Application Consultation	RM	DF
P1	28.09.2018	HW	First Issue	MB	DF

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Title

South Wales Metro - Task Order 048
 Llanwern Rail Facilities - Phase 1
 Landscape Mitigation Plan
 Sheet 2 of 2

Designed	H Wilcox	HW	Eng check	M Brewster	MB
Drawn	H Wilcox	HW	Coordination	J Bates	JB
Dwg check	M Jones	MAJ	Approved	D Francis	DF
Scale at A1	1:1250	Status	PRE	Rev	P2
		Security	STD		
Drawing Number		367590-MMD-48-XX-DR-C-0201			

