

Preliminary Bat Roost Assessment and Ground- level Tree Assessment

Ynysarwed Mine Water Treatment Scheme

The Coal Authority

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Quality information

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1. Executive Summary

AECOM was instructed by The Coal Authority to carry out a Preliminary Bat Roost Assessment and Ground-level Tree Assessment of the land at Ynysarwed, hereafter referred to as 'the Site'. The Site is in two parts, a linear built area and areas of woodland in the north-east and a reedbed in the south-west. The central grid reference of the north-east part is SN 80857 01721 and the central grid reference of the south-west part is SN 80532 01283; the boundary of the Site is shown on Figure 1.

The Site currently includes five buildings (including temporary structures), two emergency overflow ponds and a reedbed of approximately 1.9 ha used as a mine water treatment facility, an additional structure is present along the access track. There is also an area of woodland adjacent to the B4242 included within the Site boundary.

The development proposals are for the replacement of the existing mine water treatment facility and comprises construction of a new building to house a new active treatment scheme, and installation of the new treatment plant; modifications to elements of the existing treatment scheme to allow continuous treatment during construction, and re-use of certain elements of the existing scheme; decommissioning and removal of the existing plant within the existing building, the building will be retained; works around the area of the existing active treatment site to improve landscape, accessibility and water management; and, works to the existing reed beds to improve accessibility and water management. This will include construction of new pipework around the reed beds and improvements to the existing access track (infilling of potholes). Tree removal from the Neath Canal Site of Importance for Nature Conservation (SINC) is required to facilitate construction (shown as Category C trees on Drawing Number MWTS-AEC-YN-XX-DR-C-2009). Further vegetation removal works may be required to facilitate a pipeline along the eastern and southern edges of the reedbed. The Proposed Development will be undertaken via permitted development and is due to commence in March/April 2022.

Twenty trees within and adjacent to the Site were identified as having suitability for roosting bats. Five buildings within the Site and one building on the access track were assessed as having Negligible potential to support roosting bats. A Preliminary Roost Appraisal (PRA) of the buildings was conducted by Middlemarch Environmental in October 2019 and a Ground Level Tree Assessment of the trees was conducted by AECOM in February 2020. The data from these surveys was valid for up to 12 months. As such, an updated GLTA and PRA was conducted by AECOM in April 2021 and the data is considered valid for up to 12 months. The planning application for the proposed development is to be submitted at the end of Summer 2021.

Without mitigation, potential impacts include the removal of features suitable for roosting bats in trees which overhang the B4242 and the Site and loss of trees from the Neath Canal SINC. Any additional lighting during construction or operation has the potential to impact roosting bats in trees which to the north of the B4242, and disturb or deter bats from using the woodland, Neath Canal and River Neath as commuting and foraging features.

Further surveys are recommended for trees suitable for supporting roosting bats should tree or limb removal be required.

Recommendations have been made with regards to avoidance of lighting features suitable for supporting roosting bats, and commuting and foraging bats, provision of bat boxes to enhance retained habitats, working methods for felling of trees or tree limb removal on trees suitable for supporting roosting bats, when a European Protected Species Licence will be required, and actions required prior to the removal of trees within Neath Canal SINC (Category C trees on Drawing Number MWTS-AEC-YN-XX-DR-C-2009).

The Executive Summary is not a substitute for the full report. Refer to the full text for further detail.

2. Introduction

2.1 Introduction

AECOM was instructed by The Coal Authority to carry out a Preliminary Bat Roost Assessment (PRA) and Ground-Level Tree Assessment (GLTA) of the mine water treatment facility at Ynysarwed (hereafter referred to as 'the Site'). The Site is in two parts, a linear built area and areas of woodland in the north-east and a reedbed in the south-west. The central grid reference of the north-east part is SN 80857 01721 and the central grid reference of the south-west part is SN 80532 01283; the boundary of the Site is shown on Figure 1.

A Preliminary Roost Appraisal (PRA) of the buildings was conducted by Middlemarch Environmental in October 2019 and a Ground Level Tree Assessment of the trees was conducted by AECOM in February 2020. The data from these surveys was valid for up to 12 months. As such, an updated GLTA and PRA was conducted by AECOM in April 2021 and the data is considered valid for up to 12 months.

Good Practice Guidelines (Collins, 2016) requires surveys to also consider potential roosts (within trees, buildings and structures) within the Zone of Influence (Zoi) of a project. The Zoi has been assessed as within and adjacent to the Site boundary, taking into consideration construction noise and vibration, and operational lighting to COMAH regulations. The Zoi has been used to establish which features should be assessed for roosting bats.

2.2 Site Location and Description

The total area of the Site is approximately 3.24 ha. The northern area of the Site is located either side of the B4242 and adjacent to the Neath Canal. The reedbed is between the A465 and River Neath to the south (see Figure 1).

The Site currently includes five buildings (including temporary structures), two emergency overflow ponds and a reedbed of approximately 1.9 ha used as a mine water treatment facility, an additional structure is present along the access track. There is also an area of woodland adjacent to the B4242 included within the Site boundary. The Neath Canal runs adjacent the north-east section of the Site.

2.3 Proposed Development

The development proposals (hereafter referred to as the 'Proposed Development') are for the replacement of the existing mine water treatment facility and comprises the following principal operations:

- Construction of a new building to house a new active treatment scheme, and installation of the new treatment plant;
- Modifications to elements of the existing treatment scheme to allow continuous treatment during construction, and re-use of certain elements of the existing scheme;
- Decommissioning and removal of the existing plant within the existing building. The building will be retained;
- Works around the area of the existing active treatment site to improve landscape, accessibility and water management. This will include changes to surfaces and path levels and new soft landscape areas;
- Works to the existing reed beds to improve accessibility and water management. This will include construction of new pipework around the reed beds and improvements to the existing access track (infilling of potholes).

It is uncertain whether trees with limbs overhanging the B4242 may require felling or limb removal, to allow for construction traffic and machinery. Tree removal from the Neath Canal Site of Importance for Nature Conservation (SINC) is required to facilitate construction (shown as Category C trees on Drawing Number MWTS-AEC-YN-XX-DR-C-2009). Further vegetation removal works may be required to facilitate a pipeline along the eastern and southern edges of the reedbed, which may impact upon the reedbed edges and areas of grassland verge adjacent to the public footpath and vehicular access. There is also potential for the reedbed to undergo works to improve accessibility, treatment capacity and water management, but plans are not confirmed at the time of writing and it is assumed for the purposes of this report that no major de-vegetation or de-sludging works are being undertaken within the reedbed.

The Proposed Development will be undertaken via permitted development and is due to commence in March/April 2022.

2.4 Objectives

The purpose of the PRA and GLTA was to classify trees and structures as having Confirmed, High, Moderate, Low or Negligible suitability to support roosting bats to inform the need for further survey work.

This report is intended to inform the design of the proposed development and support the submission of a planning application. The report identifies the scope of further work (where necessary) that would be required to support a planning application. High level recommendations are made on potential options for the avoidance, mitigation or compensation of the potential impacts of the proposed development (where known) on the identified ecological receptors.

2.5 Legislation

All bats and their roosts in Wales are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). They are also included in Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended), known as The Habitats Regulations. The Wildlife and Countryside Act 1981 was amended by the Countryside and Rights of Way Act 2000 (CRoW) which adds an extra offence of recklessly disturbing roosting bats or obstructing access to their roosts; makes species offences arrestable, increases the time limits for some prosecutions and increases penalties.

The Wildlife and Countryside Act, the Habitats Regulations and the CRoW Act, together make it an offence, among other things, to recklessly, deliberately or intentionally:

- Capture, injure or kill any wild animal which is a European Protected Species (EPS),
- Disturb wild animal of any such species; and
- Damage or destroy a breeding or resting site of any such animal. Disturbance is defined as that which is likely:
 - To impair their ability:
 - To survive, to breed or reproduce, or to rear or nurture their young, or
 - In the case of animals of a hibernating or migratory species, to hibernate or migrate; or
 - To affect significantly the local distribution or abundance of the species to which they belong.

A bat roost is defined as *“any structure or place (including trees) which any bat uses for shelter and protection”*. Because bats tend to re-use the same roosts, legal opinion is that the roost is protected whether or not the bat(s) are present at the time.

If the proposed development is likely to destroy or disturb bats or their roosts, then a European Protected Species License (EPSL) will be required from Natural Resources Wales (NRW), which would be subject to appropriate mitigation and working methods to protect bats.

This is a brief summary of the legislation. When dealing with individual cases, the client is advised to consult the full texts of the relevant legislation and obtain further legal advice.

2.6 Quality Assurance

This survey and subsequent report were undertaken in line with AECOM's Integrated Management System (IMS). Our IMS places great emphasis on professionalism, technical excellence, quality, environmental and Health and Safety management. All staff members are committed to maintaining our certification to the international standards BS EN ISO 9001:2015 and 14001:2015 and BS ISO 45001 2018. In addition, our IMS requires careful selection and monitoring of the performance of all sub consultants and contractors.

All AECOM Ecologists who worked on this project are members of (at the appropriate level) the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow their code of professional conduct (CIEEM, 2019) when undertaking ecological work.

3. Methodology

3.1 Preliminary Roost Appraisal and Ground Level Tree Assessment

Trees and buildings throughout the Site and the Zol were classified into categories dependent on the presence of features suitable as bat roost habitat by an appropriately experienced AECOM ecologist and assistant on 06 April 2021. This was conducted via an external appraisal from the ground using binoculars and a high-powered torch where necessary, and where possible internal inspections of structures were undertaken. Table 3.1 provides descriptions of the categories for buildings and trees.

Table 3.1 Building and Tree Bat Roost Suitability Categories

Roost Suitability	Descriptions for Structures	Descriptions for Trees
Known Confirmed	Confirmed signs of bat presence/ occupation (droppings, oily staining around entry points, insect remains, odour, scratching) and actual bat presence.	Confirmed signs of bat presence/ occupation (droppings, oily staining around entry points, insect remains, odour, scratching) and actual bat presence.
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potential for longer periods of time due to their size, shelter, protection, conditions (e.g. temperature, humidity, height above ground level, light levels or levels of disturbance) and surrounding habitat. Can include structures with points of access to the interior of the building and poorly maintained fabric providing ready access points for bats into structures, but at the same time not draughty. Structures of traditional stone, brick or timber construction. Structures with large (>20cm) roof timbers with mortice joints, cracks and holes. Structures of pre or early 20th century construction. Structures with large complicated and/or uncluttered roof spaces providing unobstructed flying spaces. Structures with weather boarding and/or hanging tiles with gaps. Structures with accessible south facing roofs. Structures with proximity to good foraging habitat such as woodland, wetland, water and /or good hedgerows.	A tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potential for longer periods of time due to their size, shelter, protection, conditions (e.g. temperature, humidity, height above ground level, light levels or levels of disturbance) and surrounding habitat.
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions (e.g. temperature, humidity, height above ground level, light levels or levels of disturbance) and surrounding habitat but unlikely to support a roost of high conservation status. Can include structures with some potential to support roosting bats, but fewer features than a high risk building. Features may include areas suitable for crevice dwelling and/or access points into structures. Some proximity to foraging habitat.	A tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter protection, appropriate conditions and/or suitable habitat to be used on a regular basis or by large numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).	Tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen have only very limited roosting potential.
Negligible	No features suitable for roosting bats. Can include structures constructed from unsuitable materials e.g. prefabricated with steel and sheet material. Structure is draughty, light and cool buildings with no roosting opportunities. High levels of regular disturbance including external and/or internal lighting. Building is isolated from areas of foraging habitat.	Trees with no potential to support bats.

Source: Category descriptions drawn from Collins, 2016 and Mitchell-Jones, 2004 to be applied using professional judgement

3.2 Limitations

Where any conclusions and recommendations contained in this Report are based upon information provided by others, it has been assumed that all relevant information provided by those parties is accurate. Any such information obtained by AECOM has not been independently verified by AECOM, unless otherwise stated in the Report. AECOM accepts no liability for any inaccurate conclusions, assumptions or actions taken resulting from any inaccurate information supplied to AECOM from others.

The methodology adopted and the sources of information used by AECOM in providing its services are outlined in this Report. The work described in this Report was conducted in April 2021 and is based on the conditions encountered and the information available during the said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances. AECOM disclaim any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to AECOM's attention after the date of the Report.

During the PRA it was not possible to enter all buildings to undertake an internal inspection due to health and safety reasons. However, as detailed in Section 4 this is not considered a significant limitation to the assessment and report. Access to the woodland north of the B4242 was limited by the presence of the B4242 and the steep slope of the hill which the trees were situated on. Trees on the northern side of the B4242 were therefore assessed from the footpath on the opposite side of the road and as such the northern face of these trees could not be observed. There is the potential for features with suitability to support roosting bats to have gone unrecorded. It is not yet clear whether these trees will be impacted by the proposed development; should removal (total or limb) be required then further assessment of the northern faces of the trees may be required with a road closure for health and safety reasons.

There are deemed to be no significant limitations to this PRA and GLTA.

4. Results

4.1 Bat PRA and GLTA

Features suitable for supporting roosting bats that were reassessed during the site visit on 06 April 2021 are listed in Table 4.1. The locations of suitable roost features are shown on Figure 1 and Photographs are provided in Appendix A. There were several trees identified as being of Negligible suitability for roosting bats, these have not been described. 17 trees were concluded to have Low suitability for roosting bats, and three trees were concluded to have Moderate suitability for roosting bats.

Table 4.1 Features Assessed as Having Suitability to Support Roosting Bats

Feature ID	Photograph(s)	Description	Bat Roost Suitability Category
T01	1-2	A sycamore (<i>Acer pseudoplatanus</i>) on the opposite side of the B4242 (Neath Road) to the western most corner of the Site, just within the woodland boundary. There is one knothole on the southwest face at approximately 10 m from the ground.	Low
T02	3-4	An oak (<i>Quercus</i> sp.) on the opposite side of the B4242 (Neath Road) to the Site, just within the woodland boundary. There is a small woodpecker hole on the southeast face approximately 3 m from the ground.	Low
T03	5	A dead silver birch (<i>Betula pendula</i>) on the opposite side of the B4242 (Neath Road) to the Site, just within the woodland boundary. T03 is adjacent to T04. There is a broken branch on the west face, with the potential for a cavity, at approximately 7 m from the ground. There is a dense covering of ivy, especially as the base, which may be obscuring additional cavities or form a suitable a feature itself.	Moderate
T04	5	An oak tree on the opposite side of the B4242 (Neath Road) to the Site, just within the woodland boundary. T04 is adjacent to T03. There is a dense covering of ivy at the base that may be hiding cavities or be a feature itself.	Low
T05	6	An oak tree on the opposite side of the B4242 (Neath Road) to the Site, just within the woodland boundary. At the base of the tree, under the roots, are rocks with crevices, but it is unclear whether the feature is deep enough so as to provide protection against predation or if fly-in access is possible due the location of the road and height of the feature. A small branch which may support a cavity is located on the northwest face approx. 5 m above the ground.	Low
T06	7-8	An oak tree on the opposite side of the B4242 (Neath Road) to the Site, just within the woodland boundary. There is a missing branch and a small hole possibly leading to a cavity or crevice on the east face approximately 2 m from the ground.	Low
T07	9-10	An oak tree on the opposite side of the B4242 (Neath Road) to the Site, just within the woodland boundary. There is a missing branch with hole on the south face that is creating a void/crevice. A pair of blue tits (<i>Cyanistes caeruleus</i>) were observed using the hole for nesting, as such, it is not likely to be in current use by roosting bats.	Low
T08	11	An oak tree across the Neath Canal from the eastern most corner of the Site. There is one hole where a branch has been removed on the north side of the trunk 5 m from the ground. This hole may extend into a crevice and as such has been classified as Low precautionarily.	Low
T09	12	A willow tree (<i>Salix</i> sp.) across the Neath Canal from the eastern most corner of the Site. There is a small stem with a downward facing hole approximately 3 m off the ground facing northwest. The hole is sheltered and may not accumulate water so it is possibly suitable for bats.	Low
T10	13-14	An oak tree on south facing bank of Neath Canal. It has a large split on the north side of the trunk which likely leads into a cavity in the tree. This extends upwards from 1 m from the ground. There is also a knot hole 3 m from the ground on the north side with a gap under which may provide another entrance for bats.	Moderate

Feature ID	Photograph(s)	Description	Bat Roost Suitability Category
T11	15	A downy birch (<i>Betula pubescens</i>) tree with two holes on the north side of trunk where branches have been removed 4 m from the ground. These holes extend into cavities in the tree and could provide shelter for several bats.	Moderate
T12	16-17	An ash tree with a rotten branch 5 m from the ground. There are several plates of bark on the outside of this branch with the potential to support roosting bats, but the interior appears damp and perhaps too rotten. The Low classification is therefore precautionary.	Low
T13	18-19	A birch (<i>Betula</i> sp.) tree with a split in the trunk less than 1 m from ground level. This extends upwards at least 10 cm but is likely to be too exposed to support roosting bats. This has been classified as Low precautionarily.	Low
T14	20	An oak tree with two splits in the bark on the north side which may provide space for roosting bats.	Low
T15	22-23	A willow tree with a knot hole 2 m from the ground on the east side which likely extends into a crevice in the tree.	Low
T16	24	A willow tree with a fallen branch at 3 m on the south side of the trunk. This is unlikely to extend into a cavity in the tree, but this could not be fully accessed due to the steepness of the bank and has therefore been classified precautionarily.	Low
T17	25-26	An alder (<i>Alnus glutinosa</i>) tree with a knot hole 4 m from the ground on the north-west side. This may extend upwards into a crevice in the tree.	Low
T18-T20	N/A	This is a group of three alder trees adjacent to the reedbed with heavy ivy cover.	Low

All buildings within the Site boundary were originally assessed by Middlemarch Environmental in October 2019 (Middlemarch Environmental, 2019), aside from Building 7. The data from this survey is considered to be valid for up to 12 months. On 06 April 2021 the buildings were reassessed for their suitability to support roosting bats by AECOM. The results of the survey are provided in Table 4.2 and photographs are provided in Appendix A. All buildings were identified as being of Negligible suitability for roosting bats; one building (Building 2) had been removed since the survey in 2019.

Table 4.2 Summary of Previous Surveys for Potential Roost Suitability of Buildings Within the Site

Building ID	Photograph(s)	Description	Bat Roost Suitability Category
Building 1	27-30	A temporary, metal container in good condition with no potential bat entrance points or roosting opportunities. There is evidence of old bird nests in the south east facing corners which do not appear adequate for bats. There are several rusted holes through the south east face of the container leading into a cavity between the metal exterior and the boarding making up the interior walls; this cavity includes some foam insulation. The holes are less than a metre from the ground, with jagged edges and has no direct flight access due to the presence of a chain link fence around the south east fence. There is no other access to the cavity between the inner and outer wall (no gaps between roof and building fasciae). There are some gaps where the metal fascia boards are lifting away which leads to a gap under the corrugated metal roof; however, this feature is considered unlikely to be suitable for supporting bats due to the extreme temperature changes that would occur during the day.	Negligible
Building 2	N/A	Identified in 2019 (Middlemarch Environmental, 2019) as a temporary, metal container in excellent condition immediately adjacent to Building 1 with no potential bat entrance points or roosting opportunities. Building was not present in 2021.	N/A
Building 3	31-34	A large, metal building with a pitched, corrugated metal roof. The interior of the building is also metal, in good condition, subject to high light levels and housing mine water treatment equipment. The building is subject to high levels of disturbance – the site manager stated that when operation the equipment is	Negligible

Building ID	Photograph(s)	Description	Bat Roost Suitability Category
		extremely noisy and that the interior of the building is regularly accessed by staff throughout the day. There is a vent on the north west face which provides direct access to this unsuitable interior. No suitable roost features identified.	
Building 4	35-36	A large, concrete structure with no roof; houses mine water treatment equipment. No suitable roost features identified.	Negligible
Building 5	37-38	A temporary, metal container in excellent condition with no potential bat entrance points or suitable roost features identified.	Negligible
Building 6	39	A concrete structure with no roof and no suitable roost features identified.	Negligible
Building 7	40	Old metal structure in turning area on access track – no roof, no cavities.	Negligible

5. Ecological Constraints and Potential Impacts

The ecological constraints and potential impacts detailed here do not include consideration of further surveys which have been recommended in Section 6. The results of further surveys may change the likely potential impacts, particularly the determination of the presence/likely absence of roosting bats.

5.1 Buildings

The refurbished mine water treatment facility is expected to be within the same footprint of the existing facility. As the buildings were recorded to have Negligible suitability for roosting bats, removal of buildings will not impact roosting bats.

5.2 Trees

There is the potential that one lane of the B4242 will require closure during the works to allow access for construction vehicles and continued use of the road. To accommodate construction traffic, there is a potential requirement for removal of tree limbs overhanging the B4242. Seven trees adjacent to the B4242 road were recorded to have potential suitability for roosting bats; six were classified as Low suitability and one as Moderate suitability. As trees were only viewed from the southern side across the road, there is potential that additional roosting features were unrecorded on the northern face.

There is the potential for damage or destruction of a bat roost or disturbance, injury or killing of a roosting bat during any tree removal or tree limb removal in the woodland to the north of the B4242.

The removal of the trees from the Neath Canal SINC will require permission from the County Ecologist; and the loss of trees may reduce the value of bat commuting habitat along the Neath Canal.

5.3 Lighting

Any temporary lighting during construction or new lighting during operation has the potential to cause disturbance to roosting bats in the trees to the north of the B4242, and trees adjacent to the Neath Canal, and foraging and commuting bats along the Neath Canal and adjacent woodland habitats.

6. Recommendations for Further Surveys and Mitigation

6.1 Further Surveys

6.1.1 Ground Level Tree Assessment

Should removal (total or limb) of trees to the north of the B4242 be required then further assessment of the northern faces of the trees may be required with a road closure for health and safety reasons.

Following the further assessment, any trees to be felled or have limbs removed with suitability will require additional surveys as described in Sections 6.1.2 and 6.1.3.

6.1.2 Aerial Inspection

The GLTA has identified seventeen trees as having Low suitability to support roosting bats and three trees as having Moderate suitability to support roosting bats (locations shown on Figure 1). Should limb removal or felling of these trees be required to facilitate the proposed development, further aerial inspections of these trees would be required to confirm the presence of suitable roost features and potentially presence or likely absence of bat roosts. These inspections should be undertaken by a bat licenced ecologist and assistant both with appropriate tree climbing training or using a Mobile Elevated Work Platform (MEWP), utilising an endoscope and torch where appropriate to inspect each feature on the trees.

Following the aerial inspection, if the trees can be confirmed as having Low or Negligible suitability then these trees will not require further survey but felling or limb removal should follow a 'soft fell' methodology, as described in Section 6.2.3. However, if they are categorised as High or Moderate suitability or a Confirmed bat roost then emergence/re-entry surveys will be required as described in Section 6.1.3.

6.1.3 Emergence/Re-Entry Surveys

Should any Low and Moderate suitability trees be considered unsuitable for aerial inspection, due to health and safety issues or restricted access, or following the aerial inspection the trees are categorised as High or Moderate suitability or a Confirmed as a bat roost then emergence/re-entry surveys must be undertaken to determine usage by bats. Any trees classified as having Moderate and High suitability for roosting bats would require two and three further surveys, respectively. However, if during the survey the Moderate trees are confirmed as a bat roost then a third survey must be undertaken as this is a requirement to inform a bat license application. For any Low suitability trees that cannot be inspected aerially then these will be precautionarily upgrade to Moderate suitability and the above approach applied.

Surveys must be undertaken during the period May – September inclusive with at least one survey between May and August for trees with Moderate suitability and at least two surveys between May and August for trees with High suitability. Surveys on the same tree must be at least two weeks apart

6.2 Avoidance and Mitigation

The mitigation hierarchy has been considered and implemented. A summary is provided below.

Mitigation Hierarchy:

1. Enhance positive impacts and opportunities;
2. Avoidance – Alternative site or technology, or timing to eliminate impact;
3. Minimise – Actions during design construction and operation to minimise or eliminate impacts; and,
4. Compensation – Used as last resort to offset impacts.

6.2.1 Enhancements

The National Planning Policy Framework (February, 2021) and The Environment (Wales) Act 2016, requires that developments enhance biodiversity, as well as mitigating impacts. To enhance roosting opportunities for bats, it may be appropriate to include bat boxes as part of the proposed development, these would be best placed in the

woodland or on trees adjacent to the watercourse. The use of bat tiles and/or bricks in the construction of new buildings is unlikely to be suitable at this Site due to potential artificial light spill and the construction of the buildings.

Any proposed landscape planting on Site should benefit biodiversity, including the planting of native species. Detailed guidance on how to design and provision landscapes for bats and the insects they feed off has been supplied by the Bat Conservation Trust (Gunnell, Grant and Williams., 2012) and should be followed where possible.

6.2.2 Lighting

There is no legislation requiring an area or road to be lit (ILP, 2018). There are British Standards that relate to various components of lighting and there are also guidelines that relate to crime prevention, prevention of vehicular accidents and amenity use (ILP, 2018). There is legislation requiring bats are protected against disturbance, which includes light disturbance.

Any temporary lighting during construction or new lighting during operation should avoid light spill outside of the Site boundary and onto any newly created habitat features, to maximise their value to wildlife. No lighting should impact on trees suitable for supporting roosting bats. Furthermore, light spill onto the woodland, Neath Canal and River Neath should be avoided as they are likely to provide commuting and foraging features for any bats roosting in the area.

If external lighting will not be designed to avoid impacts in the first instance, then further surveys on all features that will be affected will be required as described in Section 6.1. If the surveys find that bats are using these features, then mitigation will be required. This will include the need to avoid light spill onto the roosts confirmed as being used by bats. Therefore, as per the above, it is recommended that external lighting is designed to avoid light spill in the first instance, to avoid the requirement of additional bat emergence/re-entry surveys and activity surveys.

Lighting installation should be in accordance with the Guidance Note 08/18, Bats and artificial lighting in the UK, Bats and the Built Environment Series (ILP and BCT, 2018).

The following recommendations in line with best practice guidance should be incorporated into any new lighting scheme at the Site:

- Light spill onto any new bat roost boxes must be avoided;
- In the first instance, external lighting must be designed to avoid light spill onto the features listed above and beyond the Site boundary.

Suggestions for mitigating external lighting and achieving the lighting recommendations above are outlined in the ILP Bats and Lighting Guidance Note (ILP, 2018) and best practice guidance (BCT, 2009, BCT 2014 and Gunnell et. al., 2012). These include:

- Only light areas which need to be lit, and use the minimal level of lighting required to comply with guidance such as Institute of Lighting Engineers Guidance Notes for the Reduction of Obtrusive Light (2005);
- Avoid aesthetic lighting which has no other function, and up lighting of trees and buildings;
- Use the lowest level of illumination required for purpose;
- Where lighting is proposed, use lighting modelling programs to indicate where the light spill will occur;
- LED luminaires should be used where possible due to their sharp cut off, low intensity, good colour rendition and dimming capability;
- A warm white spectrum (ideally <2700Kelvin) should be adopted to reduce blue light component; Avoid neutral white, cool white and blue spectrums of light;
- All luminaires should lack or have negligible UV elements. Avoid white and blue spectrums of light;
- Eliminate bare lamps and any upward pointing light;
- Luminaires should be mounted on the horizontal, i.e. no upward tilt. The spread of light should be at or near the horizontal. Flat cut off lanterns are best. Only luminaires with an upward light ratio of 0% and with good optical control should be used – See ILP Guidance for the Reduction of Obtrusive Light;

- Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012);
- Where lighting columns are in proximity (adjacent to) the wildlife corridors/boundary features and where light spill onto these features is predicted by the lighting models, the luminaries must be moved or fitted with back light control systems to reduce light spill onto the adjacent wildlife corridors/boundary features. This additional feature minimises light spill from the back of the luminaire to avoid intrusive light spill behind the column.
- Any external security lighting should be set to motion sensors and short (1 min) timers;
- Limit the times that the lights are on, to provide some dark periods; Limit the times that the lights are on to provide some dark periods; and/or dimming of lights during certain periods; the proposed new lighting could be dimmed or turned by 75% from 22:00 until 06:00 daily;
- Avoid using reflective surfaces under lights; and,
- Do not use a lamp greater than 150W for security lighting.

This will increase the value of the Site for a number of other nocturnal species, as well as for bats.

6.2.3 Low Suitability Trees – Soft-Felling of Trees or Limbs

To avoid impacts on potential roosting features, trees with Low suitability should be retained where possible.

Following aerial inspection and/or emergence/re-entry surveys, should any trees with Low suitability to support roosting bats require limb removal or felling to facilitate the proposed development, this should be carried out following a 'soft fell' methodology.

Following the recommended bat surveys and bats are confirmed as absent, should trees with Moderate or High suitability to support roosting bats require limb removal or felling to facilitate the proposed development, this should be carried out following a 'soft fell' methodology.

This 'soft fell' methodology entails felling the tree in sections, with the following precautions and in line with a Precautionary Working Methods document:

- Cutting above or below (rather than directly through) a potential roost feature;
- Lowering of cut sections gently to ground level by rope; and
- Cut sections are then to be left on Site, with any potential roost feature entrances left unobstructed, for 48 hours prior to chipping or removal from Site.

The works should be undertaken under the supervision of a suitability licensed ecologist.

Should suitable roosting features require removal, mitigation in the form of bat boxes is recommended.

The cut logs can be placed in the retained woodland to create habitat piles that will support a number of animals including invertebrates, small mammals, reptile and amphibians. The locations and sizes can be advised by the ecologist supervising on Site.

6.2.4 Tree Felling and/or Tree Limb Removal

An EPSL from NRW will be required for felling or limb removal of a tree that is a Confirmed bat roost. Further mitigation will be required as a result of the further surveys should roosting bats be confirmed as present within trees to be felled or have limbs removed. This will include tree works proceeding under a method statement and supervised by the ecologist holding the EPSL from NRW, and provision of appropriate compensatory bat roosts.

6.2.5 Neath Canal SINC Tree Removal

Permission from the County Ecologist will be required prior to any tree removal within the Neath Canal SINC (Category C trees as shown on Drawing Number MWTS-AEC-YN-XX-DR-C-2009). Additional mitigation (for example, replacement and/or compensatory habitat) may be required.

7. References

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Figure 1: Preliminary Bat Roost Assessment and Ground Level Tree Assessment Plan



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Project Title:

YNYSARWED MINE
WATER TREATMENT
SCHEME

Client:

THE COAL AUTHORITY

LEGEND

Project Boundary

Bat roost suitability - trees

Moderate

Low

Bat roost suitability - structures

Negligible

Copyright:

Contains Ordnance Survey data ©
Crown copyright and database
right 2020
Ordnance Survey 0100031673

Service Layer Credits: Source: Esri,
Maxar, GeoEye, Earthstar Geographics,
CNES/Airbus DS, USDA, USGS,
AeroGRID, IGN, and the GIS User
Community

AECOM Internal Project No:

60624809

Drawing Title:

YNYSARWED BAT
ROOST SUITABILITY PLAN

Scale at A3: 1:3,000

Drawing No: Rev:

FIGURE 1 A

Drawn: Chk'd: App'd: Date:

GM ST AP 19/04/21

Appendix A Site Photographs

	
Photograph 1: The south face of T01 as viewed from the pavement across the B4242; approximate location of knothole indicated with arrow.	Photograph 2: The south west face of T01 with a knothole.
	
Photograph 3: The south face of T02 as viewed from the pavement across the B4242; approximate location of woodpecker hole indicated with arrow.	Photograph 4: The location of the woodpecker hole in T02 on the south east face.

	
Photograph 5: Trees T03 (left) and T04 (right) south west faces, present immediately adjacent to each other. The trunks do not appear separate due to the dense ivy growing on them. The broken branch of T03 is circled.	Photograph 6: T05 south face and the locations of the small broken branch (above) and rocks at its base (below).
	
Photograph 7: T06 south east face; approximate location of the missing branch indicated by arrow.	Photograph 8: The missing branch with a potential small hole on T06.

	
Photograph 9: T07 south east face; approximate location of the missing branch indicated by arrow.	Photograph 10: The location of the missing branch with a hole on T07.
	
Photograph 11: Potential hole on T08 on north face.	Photograph 12: Small stem of T09 with downward facing hole.



Photograph 13: Two highlighted potential features on the north face of T10, a hole (top) and a split in the trunk (below).



Photograph 14: A close up photograph of the split in the north side of the trunk on T10.



Photograph 15: Two holes on the north face of T11.



Photograph 16: The rotten branch on the north west face of T12.

	
Photograph 17: A close up photograph of the rotten branch on T12.	Photograph 18: The north-east face of T13, with a split in the trunk.
	
Photograph 19: A close up photograph of the split bark on T13.	Photograph 20: The splits in the trunk on the northern side of T14.

	
Photograph 22: Knot hole on the east face of T15.	Photograph 23: A close up photograph of the knot hole recorded on T15.
	
Photograph 24: Fallen branch on the south side of T16.	Photograph 25: The location of the knot hole on T17.



Photograph 26: A close up photograph of the knot hole 4 m from the ground on T17.



Photograph 27: Building 1 north west (left) and south west face (right).



Photograph 28: Building 1 north west face (right) and north east face (left)



Photograph 29: The south east face of Building one with location of one of the old bird nest circled. The second is similarly positioned on the other south east facing corner.



Photograph 30: Example of rusted holes on the south east face of Building 1.



Photograph 31: The north west face of Building 3.



Photograph 32: The location of the vent on the north west face of Building 3.



Photograph 33: The interior of Building 3, which is well lit and surrounded only by corrugated metal walls.



Photograph 34: The interior of Building 3 showing the lack of insulation on the roof.



Photograph 35: The north west (right) and north east face (left) of Building 4.



Photograph 36: The north east face of Building 4.



Photograph 37: The south west face of Building 5.



Photograph 38: The north east face of Building 5.



Photograph 39: The northwest face of Building 6.



Photograph 40: Building 7.

