

Nenthead Mine Water Treatment Scheme

Tree Survey Report

Coal Authority

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Quality information

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1. Introduction

1.1 Background

The Department for Environment, Food and Rural Affairs (DEFRA) set up the “Water and Abandoned Metal Mines” (WAMM) Programme in 2011 to begin to tackle pollution from the hundreds of metal mines across the country. The programme is delivered as a partnership between DEFRA, the Environment Agency and the Coal Authority.

The River Nent fails to achieve good status for cadmium, lead, zinc, fish and invertebrates. The Northumbria River Basin Management Plan (RBMP), published in 2015, includes steps for addressing pollution from abandoned mines and managing the impacts to 2027. The WAMM programme has ranked the River Nent as the lowest quality in the Northumbria RBMP, and one of the lowest quality rivers in England, with respect to mine water related pollution. The pollution from the River Nent contributes to pollution in the River South Tyne up to 60km downstream. Due to these impacts, the Nent Catchment has been a priority for investigation, assessment and targeted improvement measures.

AECOM has been appointed by the Coal Authority to undertake the feasibility and outline design for a mine water treatment scheme (MWTS) at the Caplecleugh Adit and Rampgill Adit which are two of the point source contributors to the failure of the River Nent under the RBMP. The aim is to reduce the metal loading (principally lead, zinc, cadmium) within the mine water discharge from the Caplecleugh Adit and Rampgill Adit by between 70% and 90%, providing betterment to the River Nent, whilst adhering to the conditions required for consents, licences and permits. The scheme will also incorporate surface water management across the site to limit the volume of water coming into contact with contaminants.

AECOM has been instructed by the Coal Authority (the Client) to carry out a Tree Survey to BS5837:2012 Trees in relation to design, demolition, and construction – Recommendations (BS5837); to include trees with the potential to be affected by development works within or immediately adjacent to an area of Nenthead Mines, Nenthead, Alston, Cumbria, CA9 3NR (hereafter referred to as ‘the Site’). This report identifies preliminary information in relation to the nature and level of constraints posed by existing trees on the Site and is intended to inform the development of any design proposals and working methodologies to ensure that the potential impacts on significant trees are fully considered.

1.2 Trees and the Planning Process

The National Planning Policy Framework (NPPF) seeks to ensure that new development is sustainable and underlines the importance of Green Infrastructure, of which trees form an integral part. This encompasses a recognition of the importance of trees in relation to the management of air, soil and water quality along with other associated ecosystem services and climate change adaptation. The NPPF also seeks to achieve the protection and enhancement of landscapes and a net gain in biodiversity. Finally, it specifically identifies veteran and ancient trees and woodland as a highly valuable and irreplaceable habitat.

Local Planning Authorities (LPA) in the UK have a statutory duty to consider both the protection and planting of trees when considering planning applications. The potential impact of development on all trees (including those not protected by a Tree Preservation Order or other statutory designation) is therefore a material consideration.

‘BS5837:2012 Trees in relation to design demolition and construction – Recommendations (BS5837)’ provides a framework which sets out how trees should be considered in this context and also explicitly applies to development where planning consent is not required.

BS5837 recommends that a tree survey is undertaken to identify the quality and benefits of trees and the spatial constraints associated with them. This is then used to produce a Tree Constraints Plan showing the above and below ground constraints associated with trees. This drawing is used to inform the design process and to allow the retention of good quality trees where appropriate.

An Arboricultural Impact Assessment is then developed to identify the likely direct and indirect impacts of the Proposed Development, and a Tree Protection Plan is prepared to identify trees to be removed or retained and to illustrate how retained trees are to be protected. An Arboricultural Method Statement is often required as a condition of planning consent to detail how sensitive operations are to be achieved in proximity to retained trees.

These elements are the minimum normally required for a planning application and are intended to ensure both a sustainable and harmonious relationship between trees and new development.

1.2.1 Local Policy Context

Nenthead is located within the planning authority boundary of Eden District Council and within Cumbria County Council.

The Eden Local Plan¹, which was adopted October 2018, sets planning policies for the District against which planning applications are assessed. Relating specifically to trees Policy ENV2, Protection and Enhancement of Landscapes and Trees states:

Development should contribute to landscape enhancement including the provision of new trees and hedgerows of appropriate species and in suitable locations. Loss of ancient woodland and significant/veteran trees will not be permitted unless it can be demonstrated that there is an overriding need for the development which outweighs their loss.

1.3 Methodology

The tree survey has been based on the provided base plan (ref: MWTS-AEC-NC-XX-M2-C-2001 P1) and red line boundary drawing (ref: MWTS-AEC-NC-XX-M2-C-2003 P2).

The base plans did not include any tree positions and therefore tree features have been plotted indicatively using GPS and with reference to site features and publicly available aerial photography. Such trees have been marked with an ‘*’ on the Tree Constraints Plan (Appendix A) and within the Tree Survey Schedule (Appendix B). As such all positions for these trees must be considered to be indicative only and the relative distances of features must be measured out on the Site as required.

The survey was otherwise conducted in accordance with the requirements of BS5837.

The initial fieldwork was undertaken in September 2022 during which dimensional data and observational information were collected. A diameter tape measure was used to measure stem diameters where feasible.

Prior to the fieldwork, areas of trees were identified for surveying which included trees by the Nenthead Mines Car Park, trees by Rampgill Burn and trees by the quarry access on the A689. Although initially highlighted as areas of potential tree impacts, the trees along Rampgill Burn are on the north side of the burn and as such are outside of the red line boundary with no constraints within the Site. Positioned behind the Mill Cottage Bunkhouse, the trees are well beyond the area of any proposed work within the Site. Similarly, as the trees positioned across the road on the other side of the A689 and as there are no proposals to alter the main highway there will be no impact to the trees.

The fieldwork informing this report has comprised a preliminary, non-intrusive, visual survey undertaken from ground level with the specific intention of evaluating the quality and benefits of trees on the Site.

Where further inspection is deemed appropriate to ascertain the condition of the tree or other arboreal features, this has been identified within the preliminary management recommendations. Average dimensions or dimensional ranges have occasionally been used, where appropriate, to best describe features.

The Root Protection Area (RPA) is the notional extent of what is considered to be the key rooting area for tree health and function. This is generally depicted as a circle but can be amended to a polygon with an equivalent area in accordance with Section 4.6.2 of BS5837 where the RPA is likely to have developed asymmetrically. The RPA of all surveyed trees is depicted as a circle and no RPAs have been amended.

A Tree Constraints Plan showing the position of trees and the spatial constraints associated with them is included as Appendix A of this report, which corresponds with the Tree Survey Schedule presented in Appendix B.

The tree categorisation process recommended by BS5837:2012 is summarised in the table below and corresponds with the tree canopy outline shown on the Tree Constraints Plan (Appendix A) and the information in the Tree Survey Schedule (Appendix B).

¹ <https://www.eden.gov.uk/media/5032/edenlocalplan2014-2032finalwithoutforeword.pdf>

Table 1: BS5837:2012 Tree Categorisation process

Category	Definition
A	High quality, minimum of 40+ years remaining contribution
B	Moderate quality, minimum of 20+ years remaining contribution
C	Low quality, minimum of 10+ years remaining contribution
U	Unsuitable for retention, <10 years remaining contribution
1	Arboricultural value
2	Landscape value
3	Conservation or cultural value

2. General Arboricultural Principles

2.1 General Principles

Trees are dynamic living organisms which provide essential benefits to society and the wider environment. Any Proposed Development with the potential to impact on trees must take into consideration the value of trees on the Site; the impact of any proposed activity along with any potential future conflicts on the Site. Suitable measures to safeguard retained trees or mitigate the loss of trees (to be removed) will need to be fully considered and may be subject to a condition of planning consent.

Tree branches and roots frequently grow across site boundaries and off-site trees can pose a significant constraint and should be carefully considered when assessing the developable space within a site.

2.2 Below Ground Constraints

Below ground tree roots and the soil environment in which they grow need to be protected if the tree is to be retained. Trees grow in association with fungi and other soil organisms which are of key importance to tree health. Roots are essential for anchorage, the uptake of water and nutrients, and the storage of energy (carbohydrates) for the future growth and function of the tree.

Roots can be damaged by physical severance or wounding (e.g. following excavation of the soil) which can lead to the development of decay and a decline in vitality and/or instability. Raising the soil level can bury tree roots at a depth where suitable conditions for growth are less available. Toxic materials discharged into the soil (such as cement-based aggregates, fuel and chemicals) can lead to root death and dysfunction. Soils can be compacted to levels inhospitable to tree growth with even a single pass of machinery, regular pedestrian traffic or the storage of plant and materials. Relieving compaction can be problematic and may require costly remedial works. Changes in drainage/water levels can also have significant long-term impacts for tree health.

The effects of these incursions may take many years to manifest, with a resulting decline in amenity value and potentially the death or failure of the tree. It should be noted that older trees are particularly sensitive to damage and changes in conditions.

The Root Protection Area (RPA) is a notional area considered to be the minimum zone that must be protected to avoid any adverse impacts on retained trees. This area is deemed to be particularly important for tree stability, growth, function and health. However, roots may extend far greater distances, with the distribution of the root system relating directly to the availability of suitable conditions for growth (namely oxygen, water and nutrients). It is generally accepted that tree roots are predominantly located in the upper 1000mm of soil; however, roots may develop at deeper levels where conditions allow.

RPAs are calculated as per BS5837: 2012 Annex C, D and Section 4.6 in the BS 5837 2012 Document.

The RPA of the existing tree stock is an important material consideration when considering site constraints and planning development activities. The RPA of significant trees on the Site is shown on the Tree Constraints Plan (Appendix A).

The default position must be that all development, including any associated services will occur outside the RPAs of retained trees. Where this is unavoidable, it may be appropriate to use special measures to install structures, services or surfacing within RPAs which allow the protection of roots and soil structure which are essential for tree growth and keep any incursion to a minimum.

Further steps to improve or increase the useable rooting area available to the tree may also be required.

2.3 Soils

On shrinkable clay soil, tree growth can lead to the differential movement of structures as moisture is removed from the soil during the growing season. Soils must be carefully assessed, and any foundations must be installed following the recommendations of National House Building Council (NHBC) Standards Chapter 4.2: *Building Near Trees (2021)* to avoid potential future damage. Where trees which predate existing structures are to be removed, this can result in heave as the soils are re-wet.

Following a review of Cranfield University's Soilsclapes² mapping on 11th October 2022, the Site soil was identified over two sections as slowly permeable seasonally wet acid loamy and clayey soils in the main area of the Site and slowly permeable wet very acid upland soils with a peaty surface in the areas surrounding.

The advice of a suitably qualified engineer must be obtained to inform any potential issue of heave. Specific advice in relation to this issue is beyond the scope of this report.

2.4 Above Ground Constraints

Tree stems and branches can restrict available space on a site. Damage or wounding (including excessive pruning) can significantly reduce the amenity contribution of the tree and may lead to the development of dysfunction and decay, with significant long term implications for tree health. The future impact of existing trees should be carefully considered, including individual species characteristics (such as potential future size, fruit fall, shade etc.) and how the tree will interact with any proposed development and future land use. Annual tree growth can lead to direct damage if stems/branches (or roots) come into physical contact with structures and this must also be taken into consideration.

2.5 Trees and Risk in the Context of Development

Tree owners/managers have a legal duty to prevent foreseeable harm. It is generally accepted that this duty can be fulfilled by undertaking proactive inspections of significant trees to identify obvious defects and by taking appropriate remedial action or gaining further advice as appropriate.

AECOM can provide surveys and advice in relation to tree risk management if required. Further guidance is available from the National Tree Safety Group³.

The tree survey carried out as the basis of this report is primarily for planning purposes, focusing on the quality and benefits of the trees and is not specifically designed to assess the safety of trees on Site. However, when obvious issues have been identified recommendations have been included in the Tree Survey Schedule.

The Construction (Design and Management) Regulations (2015) states that developers and contractors have responsibilities for health and safety as a result of their actions. Should trees be left in an unstable or hazardous condition the Health and Safety Executive (HSE) could seek to prosecute those responsible along with the potential for further Civil claims for damages.

2.6 Trees and Wildlife

Full consideration must be given to the presence of species protected under the Wildlife and Countryside Act (1981 - as amended), the Countryside Rights of Way Act (2000) and the Conservation of Habitats and Species Regulations (2017), in particular the presence of bats and nesting birds. It is recommended that wherever possible, significant tree/hedge works take place outside of the typical bird nesting season of March to September. The advice of a suitably qualified Ecologist is recommended in relation to any potential impacts on protected species.

2.7 Tree Works

Any tree surgery recommendations contained within this report are to be undertaken in accordance with BS3998: 2010 Tree work – Recommendations (BS3998) by suitably qualified and insured contractors. Significant pruning works are best undertaken when trees are dormant or outside periods of high functional activity to reduce the overall impact on energy available to the tree for growth and processes. In general, the optimum period for works is between November to February and July to August (subject to the presence of protected species) when the tree is less active and better placed to respond to wounding and a reduction in leaf area.

² <http://www.landis.org.uk/soilsclapes/#>

³ National Tree Safety Group (NTSG),2011. Common sense risk management of trees. Forestry Commission.

3. Field Work Observations

3.1 The Site

The Site boundary is shown on the Tree Constraints Plan included within Appendix A (ref: MWTS-AEC-NC-XX-DR-Y-3103) of this report.

The Site is located in Nenthead, Alston, Cumbria and forms part of the site of a Scheduled Monument and former metal mine known as Nenthead Mines. Located in the vicinity of the River Nent the Site includes the Nenthead Mines car park to the northwest and extends through the main area of the mines to Handsome Mea Reservoir.

3.2 The Trees

Fifteen tree features were included within the tree survey including nine individual trees, five tree groups and one woodland group which are young to mature and mostly in a good condition.

The tree population consists of conifer plantation with larch (*Larix sp.*), spruce (*Picea sp.*) and Scots pine (*Pinus sylvestris*), areas of more deciduous planting dominated by beech (*Fagus sylvatica*), sycamore (*Acer pseudoplatanus*) and ash (*Fraxinus excelsior*) and younger shelterbelt planting with a mix of both deciduous and evergreen species including Scot's pine, larch, ash, beech, birch (*Betula sp.*), rowan (*Sorbus aucuparia*), pine (*Pinus sp.*), goat willow (*Salix caprea*), European larch (*Larix decidua*), grey alder (*Alnus incana*) and field maple (*Acer campestre*).

The most significant trees included within the survey are those to the east of the village car park located on an area which slopes up away from the Site. They include T8, a high quality (Category A) beech, and G10 and G15, two high quality (Category A) groups consisting of beech, sycamore, ash and Scot's pine. Other tree groups included within the survey are of note due to their visual amenity. However, they are less valuable due to poor species and/or age composition.

A number of trees across the Site were found to be in a poor condition including a number of ash showing signs of ash dieback disease (*Hymenoscyphus fraxineus*) and a number of uprooted conifers at the edges of W12.

Site photographs are included in Appendix D.

3.3 Statutory and Non-Statutory Designations

3.3.1 Statutory Designations

AECOM checked the Eden District Council website⁴ which did not identify any Tree Preservation Order or Conservation Area designations within or immediately adjacent to the Site.

A felling licence may be required by the Forestry Commission to fell more than 5m³ in any calendar quarter (subject to relevant exceptions including trees in gardens, designated public open spaces or churchyards).

Full planning consent is an exemption from the need to apply for consent for works to trees protected by a Tree Preservation Order, the need to give notice of the intention to undertake works within a Conservation Area and the need to apply for a Felling Licence with the Forestry Commission (to fell more than 5m³ per calendar quarter). Prior to any tree works the status of trees to be removed or pruned must be verified with the LPA and the Forestry Commission as appropriate.

A review of Magic Map⁵ indicates that although the Site is not within a Site of Special Scientific Interest for ecological reasons it is located within The North Pennines Area of Outstanding Natural Beauty and the majority of the site boundary is located with an area designated as a Scheduled Monument (Lead mines, ore works and smeltmill at Nenthead). Such designations are a material consideration in the planning process and, although not specifically relating to trees, the significance of any impacts to trees is likely to be considered during this process.

⁴ <https://www.eden.gov.uk/planning-and-building/trees/tree-preservation-orders-tpo-list/>

⁵ <https://magic.defra.gov.uk/MagicMap.aspx>

3.3.2 Non-Statutory Designations

Following a review of Magic Map for non-statutory designations relating to trees the Site does not include any recorded ancient semi natural woodland and/or replanted ancient woodland or any designations listed on the Priority Habitats Inventory. There are areas of conifer woodland identified within the National Forest Inventory and some areas of deciduous woodland, as listed within the Priority Habitat Inventory, are located close to the Site as indicated below.

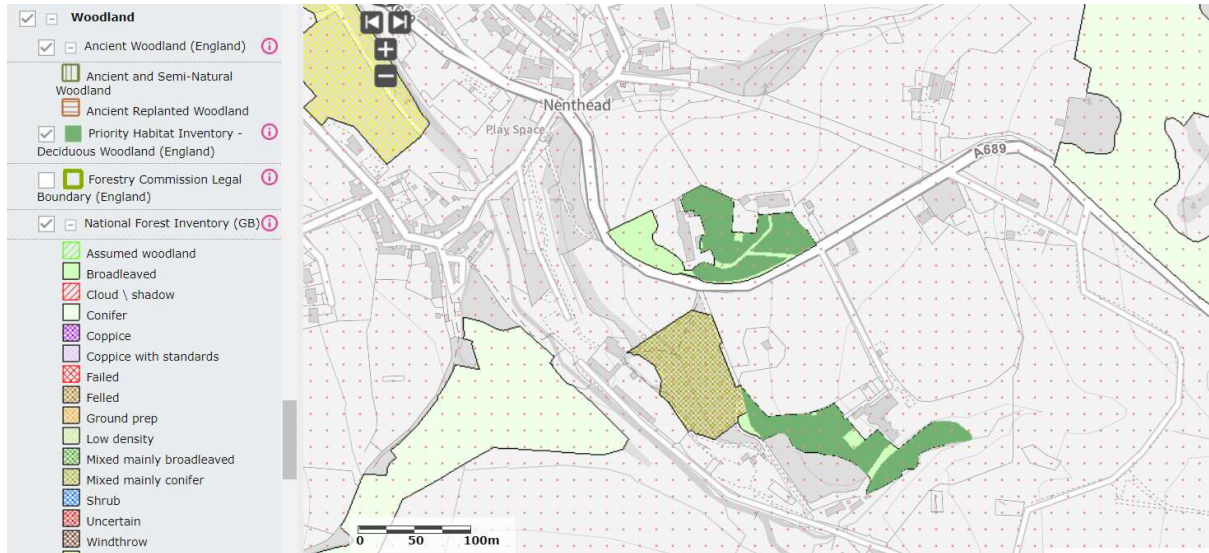


Figure 1 Extract from Magic Map showing woodland designations in proximity to the Site.

AECOM checked the Woodland Trusts Ancient Tree Inventory⁶ and no recorded ancient, veteran or notable trees were identified within or immediately adjacent to the Site.

⁶ <https://ati.woodlandtrust.org.uk/tree-search>

4. Tree Related Constraints and Opportunities

The Tree Constraints Plan (Appendix A ref. MWTS-AEC-NC-XX-DR-Y-3103) shows the area of constraints associated with the trees on the Site. As identified within the drawing key, the green shaded area shows the extent of tree canopies, the canopy outline colour indicates the quality category of the tree and the dashed black line is indicative of the RPA, which is the nominal area of tree roots which are generally considered essential to tree health and function. Roots are likely to extend outside of this point but beyond the RPA extent tree roots are not considered a significant constraint.

The default position is generally that all new features and associated works be located outside of areas where trees are to be retained.

4.1 Tree Categorisations as per BS5837:2012

The trees on the Site have been assigned to a quality category as per BS5837:2012, which relates to their arboricultural, landscape and cultural/conservation value.

Category C trees are shown by a grey canopy outline on the Tree Constraints Plan (Appendix A). This means they are of relatively low quality and would not normally be considered a significant constraint to future development. However, these trees may still provide some useful value and should be considered for retention where they do not pose a significant constraint to the Proposed Development.

Category B trees (blue canopy outline) are described as being of moderate quality and it is generally desirable to retain trees of this standard and incorporate them within the Proposed Development wherever feasible.

Category A trees (green canopy outline) are classified as being of high quality and trees of this nature should be retained and incorporated into the design of the Proposed Development due to the high level of benefits they provide.

Category U trees (red canopy outline) are trees with less than ten years of reasonable useful life expectancy or those in such poor condition that they should be removed, regardless of any development activity. Trees of this nature represent no constraint to development.

The table below summarises the number of trees in each category recorded within or adjacent to the Site.

Table 2 Summary of tree features in each quality category.

Quality Category	A	B	C	U
Number of tree features	3	10	1	1

4.2 Considerations

In planning terms lower quality trees can often be straightforwardly removed to facilitate development where their loss can be mitigated with replacement tree planting or where no replacement planting is necessary. This is likely to apply to Category C and Category U trees and hedgerows where there are no other constraints in place (e.g. ecological or heritage).

The default position must be that higher quality trees (Category A and B) be retained and protected however in some cases it may also be feasible to remove trees of this quality where there is no reasonable alternative and where the benefit of the development outweighs the impact of the loss of the tree/s. Should this be required pre application discussions with the LPA are recommended to manage the risk of refused consent.

If any of the trees are owned by third parties, prior consent must be in place before any tree works outside those permitted under established rights in common law are carried out and it is recommended that this is secured prior to the submission of any planning application.

While it is often feasible to install new hard surfacing on existing soft ground within a tree RPA this generally requires the use of raised surfaces supported by carefully located piles or the use of proprietary load bearing surfaces (such as CellWeb, ArborRaft or equivalent) installed on top of the existing unsurfaced ground level using

'no dig' techniques. New areas of hard surfacing or building footprints should not generally occupy more than 20% of the RPA of a retained tree, as set out in Section 7.4.2.3 of BS5837. Existing areas of hard surfacing can typically be retained or resurfaced without detriment to trees provided the existing sub base is retained intact to act as ground protection and to form the sub base for any new surfacing.

New services or the diversion or removal of existing services must be carefully considered. In general, all new services should be routed outside of the RPA of retained trees. Where this is unavoidable alternative methodologies such as the use of directional drilling or equivalent trenchless techniques can facilitate service installation beneath tree root systems (likely to be at least 1m+ dependent on ground conditions and tree species affected).

Shallow service runs may be installed using hand excavation where all significant tree roots can be retained and services be threaded beneath. Existing services can be winched out from a manhole/chamber located outside of a RPA and redundant pipework can be decommissioned using pipe bursting techniques to avoid excavation which could damage roots.

These operations typically require a detailed arboricultural method statement to set out in detail how they can be successfully achieved.

4.3 The Future Impact of Trees

The future impact of trees on the Site must be considered in relation to any development proposals. Trees and groups to be retained must be afforded suitable space to ensure they remain viable in the long term. Trees which are currently not fully grown will increase in size and this must be considered in conjunction with the Proposed Development and future use of the Site.

Deciduous trees will drop leaves/needles each autumn and evergreen trees will deposit needles, seeds, cones and other detritus throughout the year, and this is likely to result in a maintenance requirement where tree canopies extend over or immediately adjacent to elements of the Proposed Development. Guards should be considered where they are likely to reduce the potential for leaves etc. to block drains and watercourses for example.

4.4 Tree Protection

Trees to be retained in proximity to areas of development activity, including areas for new surfacing, services, work site compounds and storage will need to be protected to ensure they are not damaged. This is generally achieved with the use of robust, immovable temporary tree protection fencing, to prevent access within the RPA or canopy spread of trees. Where access is unavoidable, alternative protection arrangements such as ground protection (sufficient to protect the structure of the soil from compaction), and /or access facilitation pruning (to ensure a reasonable clearance for operations is provided) may be required. The advice of an arboriculturist should be sought to inform this assessment.

4.5 Tree Planting

Where trees are to be removed due to a conflict with the proposed design, mitigation planting is likely to be required to ensure a continuity of tree cover for the Site and to address any negative impact on local amenity and landscape character. Consideration should be given to the reasonable provision of space for new tree planting to off-set any necessary tree loss.

Soil structure in areas for new planting will need to be maintained and may require protection during operation of the Proposed Development to ensure reasonable conditions for future tree growth are available.

New planting should consider the existing species mix present on site in relation to both arboricultural and ecological considerations. New planting also offers an opportunity to increase the species and age class diversity for a given area which can boost the resilience of the local tree stock in relation to pests, disease and climate change as well as providing a greater range of amenity and other benefits.

New trees should be planted in accordance with the guidance set out in BS8545:2014 Trees: from nursery to independence in the landscape - Recommendations (BS8545) and with the minimum distances from new structures, services and surfacing set out in Table A.1 of BS5837. AECOMs arboriculturists can provide further advice in relation to this issue if required.

5. Summary and Conclusion

The survey area contains 15 tree features which consist of young, relatively recent plantings through to fully mature groups of individual trees. The surveyed trees are mostly in a good condition although a few defects including uprooted conifers and ash with ash dieback disease were identified. The tree features on the Site provide significant amenity and form a spatial constraint to any potential development works.

All moderate and high value trees should be afforded full protection where possible. If the potential removal of higher value trees (Category A and B) is unavoidable this should be discussed in advance with the local planning authority (Eden District Council). However, the default position must be that trees of this quality are to be retained and protected where possible.

Where it is not possible to completely avoid the area of constraint associated with significant trees it may be possible to utilise special measures to facilitate the works.

Lower quality trees (Category C and U) are not likely to be significant constraint to development where they can be satisfactorily replaced with new tree planting (or where their loss will not have a significant impact - eg due to the retention of adjacent trees) and therefore some sections of lower quality tree cover may be feasible to remove from a planning perspective.

A key consideration for any development activity will be the protection of the surrounding trees including the structure of the soil in which they grow, including from indirect damage via the storage or discharge of materials and the movement and use of plant and machinery. The default position is that all RPA and canopies of retained trees be fenced off as exclusion zones with no access. Where this is not feasible limited access may be acceptable using fit for purpose ground protection or other protective measures in accordance with BS5837.

Outside of the canopy and RPA, development works are not likely to be significantly constrained by trees, however it is important not to significantly impact on ground water levels in proximity to trees and where this could be a potential impact specific arboricultural advice must be obtained.

Where trees of quality are to be removed planning policy is likely to require mitigation in the form of new tree planting.

As the design progresses, it is recommended that the advice of an arboriculturist is sought to inform this process, particularly in relation to new features in close proximity to trees.

Draft layouts should be overlaid onto the Tree Constraints Plan to allow an assessment of the impact of the design, including the identification of any trees which are to be removed.

An Arboricultural Impact Assessment is typically required to support a planning application, and this allows the identification and assessment of the direct and indirect effects of the Proposed Development along with appropriate mitigation measures where necessary.

6. References

British Standards Institution (BSI), BS5837:2012. Trees in relation to design, demolition and construction – Recommendations. BSI

British Standards Institution (BSI), BS3998:2010. Tree work – Recommendations. BSI

British Standards Institution (BSI) BS8545: 2014 Trees: from the nursery to independence in the landscape – Recommendations

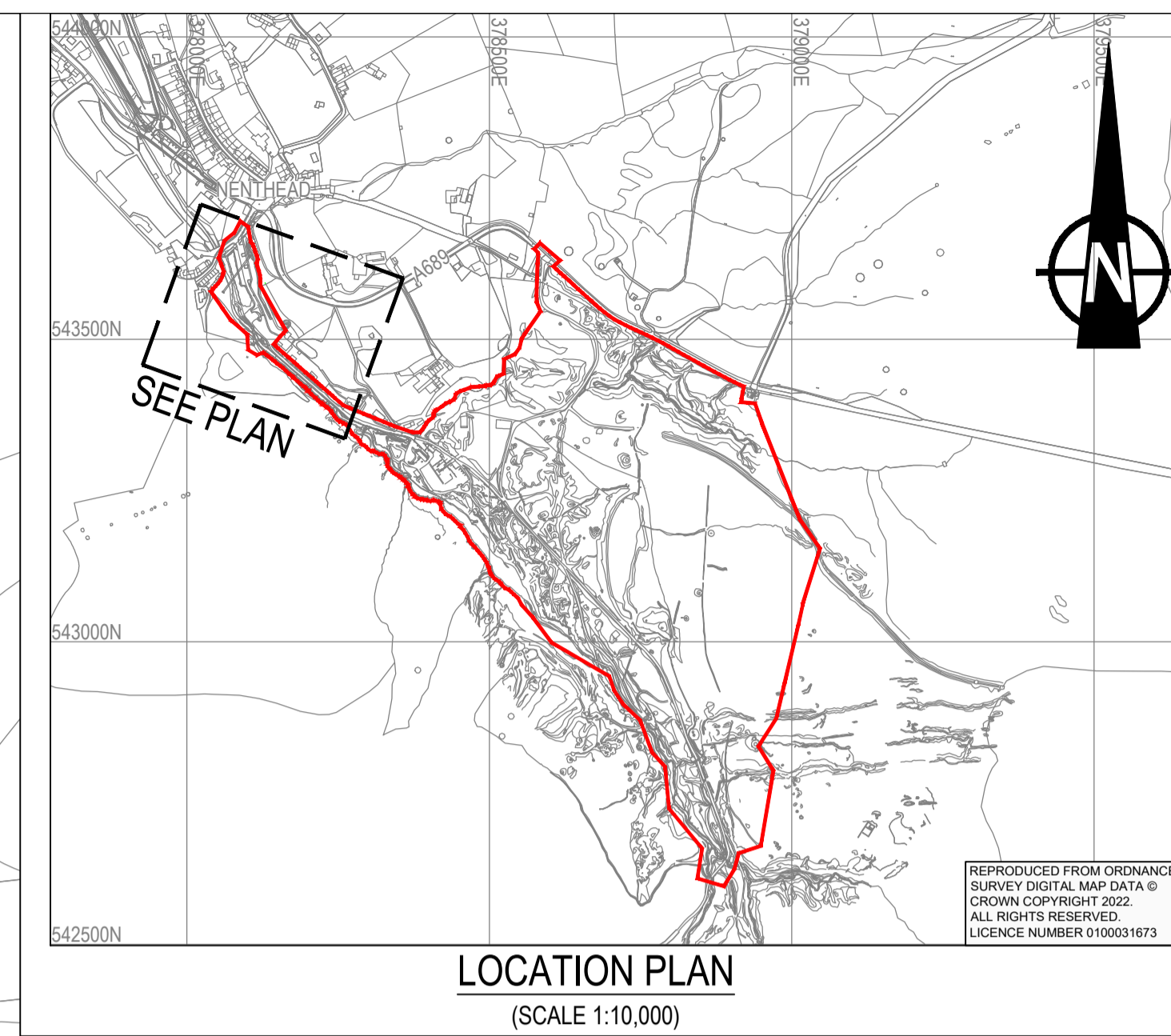
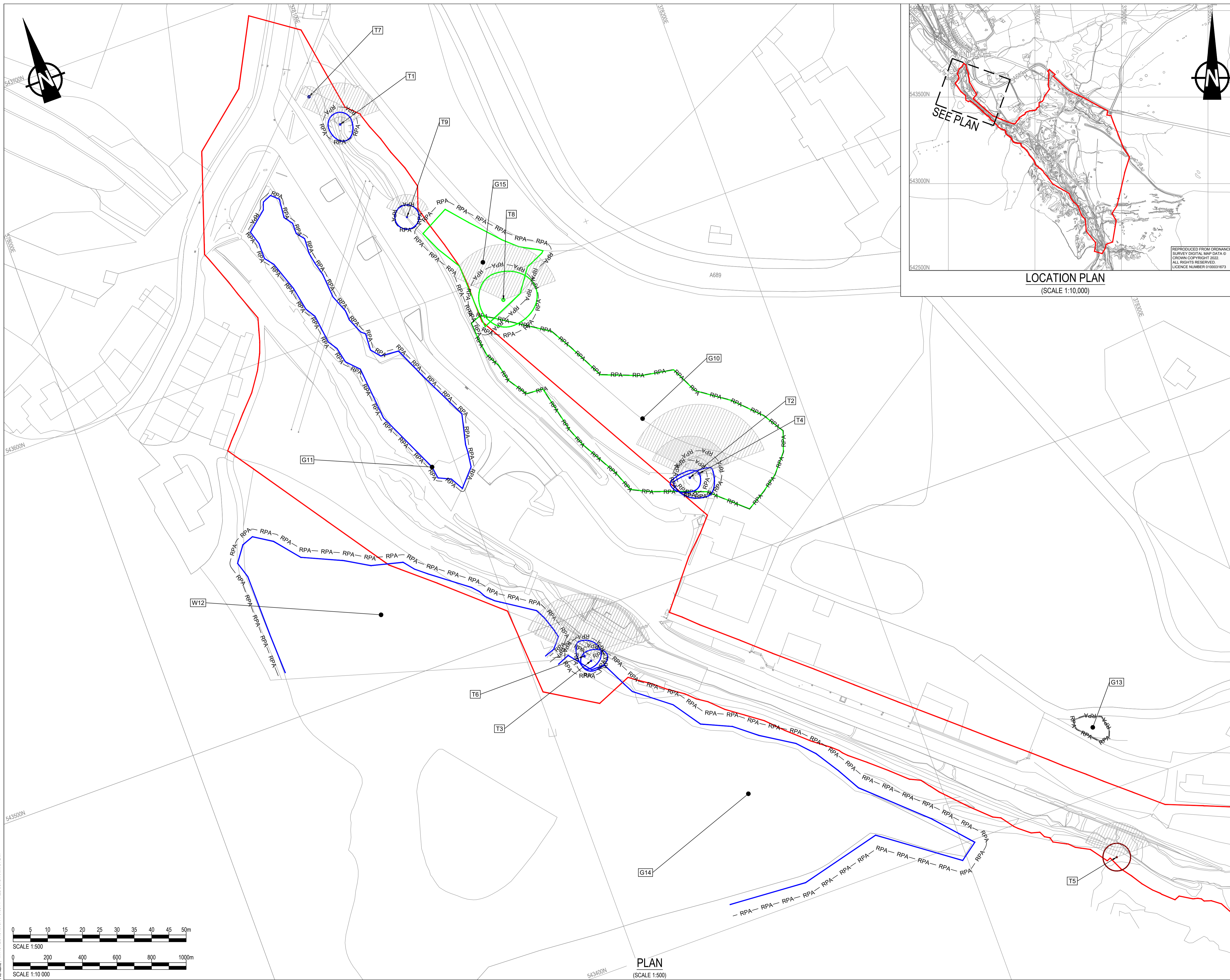
Ministry of Housing, Communities and Local Government (MHCLG), 2021. National Planning Policy Framework (NPPF). MHCLG

National House Building Council (NHBC) Standards, (2021). Chapter 4.2: Building Near Trees

National Joint Utilities Group (NJUG) Volume 4, Issue 2, (2007). NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.

National Tree Safety Group (NTSG), 2011. Common sense risk management of trees. Forestry Commission.

Appendix A Tree Constraints Plan



IT IS ASSUMED THAT ALL WORKS ON THIS DRAWING WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROPRIATE METHOD STATEMENT.

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT.

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED
2. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALISED DRAWINGS, DETAILS AND SPECIFICATIONS.
3. ANY DISCREPANCIES ON SITE ARE TO BE REPORTED TO THE PROJECT MANAGER IMMEDIATELY.
4. TOPOGRAPHICAL SURVEY IS BASED ON RPS DRAWINGS 'TOPOGRAPHICAL SURVEY' SHEETS 1-6 REF UAM3149_A DATED JULY 2019 AND PMC SURVEYS LTD DRAWINGS 'RIVER NENT CATCHMENT METAL MINE REMEDIATION' REF 600/1 TO 600/3 DATED 08/10/2013.
5. TREE CATEGORIES AS DEFINED BY BS 5837:2012.
6. TREE LOCATIONS ARE BASED ON THE TOPOGRAPHICAL SURVEY, AERIAL IMAGERY, AND GPS CO-ORDINATES FROM ON SITE WALKOVER.
7. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH TREE SURVEY REPORT REF. MWTS-AEC-NC-XX-RP-Y-3120.
8. THE ORIGINAL OF THIS DRAWING WAS PRODUCED IN COLOUR - A MONOCHROME COPY SHOULD NOT BE RELIED UPON.

KEY

- RED LINE BOUNDARY
- A CATEGORY TREE, GROUP, HEDGE OR WOODLAND (HIGH QUALITY & VALUE)
- B CATEGORY TREE, GROUP, HEDGE OR WOODLAND (MODERATE QUALITY & VALUE)
- C CATEGORY TREE, GROUP, HEDGE OR WOODLAND (LOW QUALITY & VALUE)
- U CATEGORY TREE, GROUP, HEDGE OR WOODLAND (UNSUITABLE FOR RETENTION)
- ROOT PROTECTION AREAS (RPA) (AS DEFINED BY BS 5837:2012)
- APPROXIMATE SHADING ARC (AS DEFINED BY BS 5837:2012)

This drawing is for preliminary purposes only and is subject to amendment during design development. UNDER NO CIRCUMSTANCES MUST THIS DRAWING BE USED FOR CONSTRUCTION PURPOSES

Revision Details		By	Date	Suffix

Purpose of issue: **PRELIMINARY**

Client: **COAL AUTHORITY**

Project Title: **NENTHEAD MWTS**

Drawing Title: **TREE CONSTRAINTS PLAN**

Designed	Drawn	Checked	Approved	Date
GT	GT	AW	LW	26.10.2022

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Scale @ A1 AS SHOWN

Suitability: -
Zone: -

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Appendix B Tree Survey Schedule

Ref. No	Species Common Name (<i>Scientific name</i>)	Estimated Height (m)	Stem Diameter (mm)	Canopy Spread (m)				First Significant Branch & direction (m)	Canopy Clearance height (m)	Physiological Condition	Life Stage	Structural Condition	Observations	Preliminary Management Recommendations	Estimated Remaining Contribution (yrs)	Category	RPA (m ²)	RPA Radius (m)
				N	S	E	W											
T1*	Scots Pine (<i>Pinus sylvestris</i>)	12	420	3.5	5	3.5	3.5	1.0/All	0	Good	M	Good	On western bank of ditch. Good shape and form. No major visible defects.		20+	B1,2	79.81	5
T2*	Sycamore (<i>Acer pseudoplatanus</i>)	12	420	2	4	3	6	2.0/NW	1	Good	M	Fair	One sided although dense canopy.		20+	B1,2	79.81	5
T3*	European Larch (<i>Larix decidua</i>)	18	360	3	3	5	3	6.0/All	0	Good	EM	Fair	Separated from group by fence. 3.5m back from beck.		20+	B1,2	58.64	4.3
T4*	Ash (<i>Fraxinus excelsior</i>)	20	550	1	7	4	8	3.0/SW	1	Fair	M	Fair	Significant grazing damage to base of stem. Old ripped out wound at 4m with good woundwood formation. Minor deadwood.		20+	B1,2	136.87	6.6
T5*	European Larch (<i>Larix decidua</i>)	10	320	4	4	4	4	n/a	0	Poor	M	Fair	Almost dead with very little live growth limited to upper canopy and southwest.		<10	U1	46.33	3.8
T6*	European Larch (<i>Larix decidua</i>)	18	470	4.5	4	5	2	6.0/All	0	Good	M	Fair	Separated from group by fence. 3.5m back from beck. Forked at 7m into twin stem with small central additional stem.		20+	B1,2	99.95	5.6

Ref. No	Species Common Name (<i>Scientific name</i>)	Estimated Height (m)	Stem Diameter (mm)	Canopy Spread (m)				First Significant Branch & direction (m)	Canopy Clearance height (m)	Physiological Condition	Life Stage	Structural Condition	Observations	Preliminary Management Recommendations	Estimated Remaining Contribution (yrs)	Category	RPA (m ²)	RPA Radius (m)
				N	S	E	W											
T7*	Rowan (<i>Sorbus aucuparia</i>)	3	30	0.3	0.3	0.3	0.3	n/a	1	Good	Y	Good	New tree planted for Queen's Jubilee with ornate metal guard and stone with plaque.		20+	B3	0.41	0.4
T8*	Beech (<i>Fagus sylvatica</i>)	16	850#	8	8	10	7	2.0/E , 2.0/S	1	Good - Fair	M	Good - Fair	Thick bole but immediately producing a dense, multi-stemmed form. No obvious veteran features but valuable individual with some deadwood. Included union to east with split developing and weighted to east, low occupancy area.		40+	A1,2	326.89	10.2
T9*	Sycamore (<i>Acer pseudoplatanus</i>)	6	310	3.5	3.5	3.5	3.5	0.5/N	0	Good	EM	Good	On east side of ditch. Slightly one sided.		20+	B1,2	43.48	3.7
G10*	Sycamore (<i>Acer pseudoplatanus</i>), Ash (<i>Fraxinus excelsior</i>)	24	<500#	6 Avg				n/a	n/a	Good - Poor	EM-M	Good	Mostly sycamore interspersed with ash. Mostly in good condition but one ash showing severe signs of dieback, likely Ash Dieback disease.		40+	A1,2	113.11	6 max
G11*	Scots Pine (<i>Pinus sylvestris</i>), Birch (<i>Betula sp.</i>), Rowan (<i>Sorbus aucuparia</i>), Pine (<i>Pinus sp.</i>), Goat Willow (<i>Salix caprea</i>), European Larch (<i>Larix decidua</i>), Grey Alder (<i>Alnus incana</i>), Field Maple (<i>Acer campestre</i>)	12	240	2 Avg				n/a	n/a	Good - Fair	Y-SM	Good - Fair	Shelterbelt planting. Dominated by Scots pine and larch. Trees beneath overhead cables have been topped at 5m.		20+	B1,2	26.06	2.9
W12*	Fir (<i>Abies sp.</i>), Larch (<i>Larix sp.</i>),	18	<350#	See Plan				n/a	n/a	Good - Poor	SM-EM	Good - Poor	Plantation with occasional uprooted tree and dead stem due to suppression.		20+	B1,2	55.42	4.2 max
G13*	Scots Pine (<i>Pinus sylvestris</i>)	4	100	1.5 Avg				n/a	n/a	Good	Y	Good	A small group of well-spaced individual trees located on a slope behind a 1m retaining wall.		10+	C1,2	4.52	1.2

Ref. No	Species Common Name (<i>Scientific name</i>)	Estimated Height (m)	Stem Diameter (mm)	Canopy Spread (m)				First Significant Branch & direction (m)	Canopy Clearance height (m)	Physiological Condition	Life Stage	Structural Condition	Observations	Preliminary Management Recommendations	Estimated Remaining Contribution (yrs)	Category	RPA (m ²)	RPA Radius (m)
				N	S	E	W											
G14*	Larch (<i>Larix sp.</i>), Spruce (<i>Picea sp.</i>), Fir (<i>Abies sp.</i>), Scots Pine (<i>Pinus sylvestris</i>)	20	450#	2 Avg				n/a	n/a	Good	SM-M	Good - Fair	Cluster of individuals with grass beneath, well-spaced.		20+	B1,2	91.62	5.4 Avg
G15*	Beech (<i>Fagus sylvatica</i>), Sycamore (<i>Acer pseudoplatanus</i>), Scots Pine (<i>Pinus sylvestris</i>), Ash (<i>Fraxinus excelsior</i>)	24	450# Avg 400 - 1200	See Plan				n/a	n/a	Good - Poor	SM-OM	Good - Poor	Mostly mature to over mature beech at top of group (away from site with diameter up to 1200mm) with occasional sycamore and ash lower down towards site boundary. Ash with dieback, likely Ash Dieback disease. One mature Scots pine 10m back from ditch.		40+	A1,2	91.62	5.4 Avg

Appendix C Key to Abbreviations Used in the Survey

Ref No	Specific identification number given to each tree or group. T=Tree/H=Hedge/G=Group.	
Species	Common name followed by botanical name shown in <i>italics</i>	
RPA	Root Protection Area (As defined by BS5837)	
Stem diameter	Diameter of main stem, measured in millimetres at 1.5 m above ground level. (MS = Multi-stem tree measured in accordance with BS5837 Annexe C)	Av / Average: indicates an average representative measured dimension for the group or feature
Spread	The width and breadth of the crown. Estimated on the four compass points in metres.	
Crown clearance	The estimated height (in metres) above ground level of the lowest significant branch attachments.	
#	Estimated dimensions	
*	Indicates estimated position of tree (not indicated on topographical survey).	
Category	Categorisation of the quality and benefits of trees on Site as per Table 1 and 2 of BS5837:2012. 1=Arboricultural quality/value 2=Landscape quality/value 3=Cultural quality/value (including conservation)	
	A=High quality/value 40yrs+ (light green). B=Moderate quality/value 20yrs+ (mid blue) C=Low quality/value min 10yrs/stem diameter less than 150mm (grey). U=Unsuitable for retention (dark red).	
Life stage	<p>Young (Y): Newly planted tree 0-10 years.</p> <p>Semi-Mature (SM): Tree in the first third of its normal life expectancy for the species (significant potential for future growth in size).</p> <p>Early Mature (EM): Tree in the second third of its normal life expectancy for the species (some potential for future growth in size)</p> <p>Mature (M): Tree in the final third of its normal life expectancy for the species (having typically reached its approximate ultimate size).</p> <p>Over Mature (OM): Tree beyond the normal life expectancy for the species.</p> <p>Veteran (V): Tree which is of interest biologically, aesthetically or culturally because of its condition, size or age.</p>	
Structural condition	<p>Good: No significant structural defects</p> <p>Fair: Structural defects which can be resolved via remedial works.</p> <p>Poor: Structural defects which cannot be resolved via remedial works.</p> <p>Dead: Dead.</p>	
Physiological condition	<p>Good: Normal vitality including leaf size, bud growth, density of crown and wound wood development.</p> <p>Fair: Lower than normal vitality, reduced bud development, reduced crown density, reduced response to wounds.</p> <p>Poor: Low vitality, low development and distribution of buds, discoloured leaves, low crown density, little extension growth for the species.</p> <p>Dead: Dead</p> <p>Fair/Good = Indicates an intermediate condition</p> <p>Fair – Good = Indicates a range of conditions (e.g. within a group)</p>	
Preliminary management recommendations	Works identified during the tree survey as part of sound arboricultural management, based on the current context of the Site (where relevant reference has been made to tree management based on the potential future context of the site).	

Shading Arc	The shading arc is shown on the Tree Protection Plan as a requirement of BS5837 and is an indication of the potential direct obstruction of sunlight resulting from the trees. It is plotted as a segment, with a radius from the centre of the stem equal to the height of the tree, drawn from due northwest to due east, indicating the shadow pattern through the main part of the day.
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Appendix D Site Photography



Photo 1 T8, a fully mature beech



Photo 2 Mostly sycamore forming this high quality group but with one ash showing severe signs of ash dieback



Photo 3 G14 a woodland group of mostly larch and pine



Photo 4 Looking southeast beyond T5



Photo 5 Looking towards T2 and T4 to the front of the fence with G10 beyond



Photo 6 View up stream with G14 to the right



Photo 7 View of Caplecleugh adit with G14 behind

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