



**Haweswater Aqueduct Resilience Programme - Proposed Bowland  
Section**

**Environmental Statement**

**Volume 4**

**Appendix 1.2: Glossary and Key Terms**

June 2021



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## Haweswater Aqueduct Resilience Programme - Proposed Bowland Section

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## 1. Glossary and Key Terms

### 1.1 Introduction

- 1) This document provides a list of phrases used throughout the Environmental Statement that support the individual topics of the Environmental Impact Assessment. The list of phrases has been split for each chapter.

### 1.2 General Terms

- **Above Ordnance Datum (AOD):** Term referring to a height above a vertical datum or reference point used by the British Ordnance Survey for deriving altitudes on maps
- **Assessment of Effects:** The assessment of changes arising from the development that is being assessed
- **Baseline Conditions:** The environmental and community conditions within an environmental impact assessment area prevailing at the present time or a point in the future without the proposed development in place
- **Baseline Data:** A collection of data which describes the pre-existing, or background, conditions. The data are used as a benchmark to measure change which occurs following construction and / or operation of a project
- **Construction Code of Practice (CCoP):** A document which sets out proposed measures and standards of work to which contractor(s) must adhere to comply with relevant environmental regulations, reduce pollution and control potential impacts on the natural and human environment
- **Cumulative Effects:** Environmental effects arising from the combined impacts of two or more separate proposed developments (inter-development cumulative effects), or from two or more types of impact affecting a given receptor type or group (intra-development effects)
- **Design Manual for Roads and Bridges (DMRB):** A comprehensive manual, prepared by Highways England and the corresponding agencies in the devolved administrations, which sets out technical and environmental standards for designing, assessing and building trunk roads
- **Embedded Mitigation:** Mitigation that is achieved through good engineering design or technical solutions at source which avoid potential environmental impacts occurring in the first instance, thereby avoiding the need for mitigation measures to address environmental impacts after they have arisen
- **Environmental Impact Assessment (EIA):** An iterative process used to identify, predict and mitigate the likely significant beneficial and adverse environmental impacts of a proposed project
- **Environmental Statement (ES):** An environmental impact assessment report produced to describe the outcome of the Environmental Impact Assessment process
- **Essential Mitigation:** Additional mitigation that is required in the event that embedded or good practice mitigation solutions are insufficient to meet required environmental standards or agreed outcomes
- **GIS:** Geographical Information System
- **Good Practice Measures:** Approaches that are broadly recognised by environmental practitioners, regulators, stakeholders, decision makers and construction contractors as being proportionate and necessary to meet acceptable environmental, technical, legal and policy outcomes.
- **Impact:** This distinguishes between the 'impact', defined as the action being taken, and the 'effect', defined as the change resulting from that action
- **Local Planning Authority (LPA):** The public authority whose duty it is to carry out specific planning functions for a particular area

- **MAGIC:** Multi-Agency Geographical Information for the Countryside
- **Magnitude:** The quantifiable size, amount, intensity or volume of an environmental impact
- **Mitigation:** A process, activity or measure designed to avoid, reduce or remedy adverse environmental effects
- **Mitigation Measures:** Actions that are taken to minimise, prevent or compensate for adverse effects of the development
- **NPPF :** National Planning Policy Framework
- **NPPG :** National Planning Practice Guidance
- **Open-cut:** Excavated trenches in the ground with pipes being placed in the trenches prior to backfilling with excavated or imported material
- **Opening Year:** The year in which the Proposed Marl Hill Section is scheduled to come into operation
- **Proposed Programme of Works:** The broader Haweswater Aqueduct Resilience Programme which comprises the five separate proposed replacement tunnel sections
- **Sensitivity:** The susceptibility of an environmental or community asset or resource to change brought about by a proposed development
- **Shaft:** A tunnel shaft is a pit or vertical excavation sunk from ground level to the lower level of a tunnel
- **Tunnel Boring Machine (TBM):** A machine used to excavate tunnels with a circular cross-section through a variety of soil and rock strata. They can be designed to bore through most types of geology from hard rock to sand
- **Water Treatment Works (WTW):** A facility that treats 'raw' water through chemical and or physical processes to make it fit for human consumption.

### 1.3 Chapter 6: Landscape and Arboriculture

- **Ancient tree:** An ancient tree is exceptionally valuable, attributed with great age / size / cultural heritage / biodiversity value as a result of significant wood decay and the habitat created from the ageing process. All ancient trees are veteran trees, with very few trees of any species reaching the ancient life-stage
- **Arboricultural Impact Assessment (AIA):** A tree survey that considers how a proposed development may impact on arboricultural resources such as individual trees, tree groups, woodlands and hedgerows
- **Arboricultural Method Statement (AMS):** A procedure that sets out how construction site works should be carried out near trees to avoid accidental damage
- **AONB:** Area of Outstanding Natural Beauty
- **Bark:** A term usually applied to all the tissues of a woody plant lying outside the vascular cambium
- **Basal flare:** The region at the base of a tree where the major lateral roots join the stem, with buttress-like formations on the upper side of their junction
- **Landscape characteristics:** Those combinations of elements which are particularly important to the current character of a landscape and which give an area its distinctive sense of place
- **Tree condition:** An indication of the physiological vitality of the tree. Where the term 'condition' is used in a report, it should not be taken as an indication of the stability of the tree
- **Conservation Area:** A statutory cultural heritage designation that requires notice (currently six weeks) to be given to the local planning authority prior to the commencement of any tree works

- **Construction Exclusion Zone:** Area based on the Root Protection Area (in square metres) to be protected during development by the use of barriers and / or ground protection
- **Crown / Canopy:** The main foliage-bearing section of the tree
- **Crown Retrenchment:** Die-back of the outer crown, giving rise to deadwood and stag-heads. A tree's crown retrenches after it reaches late maturity, or owing to some prejudicial episode (e.g. root damage, summer drought, insect infestation, etc.) from which the tree may or may not recover
- **Deadwood:** Branch or stem wood bearing no live tissues
- **Defect:** In relation to tree hazards, any feature of a tree which detracts from the uniform distribution of mechanical stress, or which makes the tree mechanically unsuited to its environment
- **Diameter at Breast Height (DBH):** Stem diameter measured at a height of 1.5 metres (UK) or the nearest measurable point. Where measurement at a height of 1.5 m is not possible, another height may be specified
- **Dieback:** The death of parts of a woody plant, starting at shoot-tips or root-tips
- **Disease:** A malfunction in or destruction of tissues within a living organism, usually excluding mechanical damage; in trees, usually caused by pathogenic micro-organisms
- **Effect:** The term defined as the change resulting from an action (GLVIA3). See Impact above
- **Epicormic:** Adventitious shoot growth from a tree stem or branch characteristic of some native broadleaf tree species. Shoots typically arise from suppressed buds in bark and are often stimulated to grow as a result of stress
- **Epiphyte:** An organism that grows on the surface of a host plant but does not derive resources directly from the host. Presence on trees is often indicative of the tree's wider ecosystem / habitat value
- **European Landscape Convention (ELC):** The first international convention to focus specifically on landscape. It is dedicated exclusively to the protection, management and planning of all landscapes in Europe
- **Fungi:** Plural form of any known species within the kingdom Fungi. Presence on trees is associated with maturing features and tree condition
- **Guidelines for Landscape and Visual Impact Assessment, 3<sup>rd</sup> edition (GLVIA3) (Landscape Institute, IEMA):** Comprehensive guidelines, prepared by the Landscape Institute in conjunction with the Institute of Environmental Management and Assessment, that sets out current guidelines for landscape and visual assessment
- **Hazard Beam / Split:** An upwardly curved part of a tree in which strong internal stresses may occur without being reduced by adaptive growth; prone to longitudinal splitting
- **Landscape:** An area, as perceived by people, the character of which is the result of the action and interaction of natural or human factors
- **Landscape Character:** A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another
- **Landscape Character Types (LCTs) and Sub-Types (LCSTs):** Distinct types of landscape that are relatively homogeneous in character. These are generic in nature, in that they may occur in different areas in different parts of the country, but wherever they occur they share similar characteristics
- **Landscape Effects:** Effects on the landscape as a resource in its own right
- **Landscape Receptors:** Defined aspects of the landscape resource that have the potential to be affected by the Proposed Marl Hill Section
- **Landscape and Visual Impact Assessment (LVIA):** General term used by practitioners to describe the activity of assessing landscape and visual impacts

- **Magnitude of Change:** A combined measure of the size and scale of the effect, the extent of the area over which it occurs, its reversibility and its duration
- **National Character Area (NCA):** Natural England has divided England into 159 distinct natural areas. Each is defined by a unique combination of landscape, biodiversity, geodiversity, history, and cultural and economic activity. Their boundaries follow natural lines in the landscape rather than administrative boundaries
- **Notable Tree:** Usually a mature tree which may stand out in the local environment because it is large in comparison with other trees around it. In parts of the UK where trees are less common, a tree may be relatively small but notable because it is significant in its local environment
- **Photomontage:** Visualisation which superimposes an image of a proposed development upon a photograph using highly calibrated photographic and computer modelling techniques
- **Pollarding:** The removal of the tree canopy, back to the stem or primary branches. Pollarding may involve the removal of the entire canopy in one operation or may be phased over several years
- **Primary Branch:** A major branch, generally having a basal diameter greater than 0.25 x stem diameter
- **Pruning:** The removal or cutting back of twigs or branches, sometimes applied to twigs or small branches only, but often used to describe most activities involving the cutting of trees or shrubs
- **Representative Viewpoint:** A location from which representative views of a proposed development can be seen by individuals and / or defined groups of people who have the potential to be affected by the development
- **Root Protection Area (RPA):** A layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority
- **Sense of Place:** Characteristics that make a place special or unique
- **Stem/s:** The main supporting structure/s, from ground level up to the first major division into branches
- **Stress:** In plant physiology, a condition under which one or more physiological functions are not operating within their optimum range, for example due to lack of water, inadequate nutrition, or extremes of temperature
- **Susceptibility:** The ability of a defined landscape or visual receptor to accommodate the specified proposed development without undue negative consequences
- **Tranquil Areas:** Places which are sufficiently removed from visual or noise intrusion of development or traffic to be considered unspoilt by urban influences
- **Tree Preservation Order (TPO):** A statutory order made by the local authority and placed upon individual trees, groups of trees or areas of trees. The local authority must usually grant permission prior to any works undertaken to affected trees
- **Understorey:** A layer of vegetation beneath the main canopy of woodland or forest, or plants forming this
- **Veteran Tree:** A loosely defined term for an old specimen that is of interest biologically, culturally or aesthetically because of its age, size or condition, and which has usually lived longer than the typical upper age range for the species concerned
- **Visual Amenity:** The overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of people living, working, recreating, visiting or travelling through an area
- **Visual Effects:** Effects on specific views and on the general visual amenity experienced by people
- **Visual Envelope:** The approximate area within which a proposed development is visible

- **Visual Receptors:** Individuals or defined groups of people who have the potential to be affected by the Proposed Marl Hill Section
- **Wind-throw:** The blowing over of a tree at its roots
- **Zone of Theoretical Visibility (ZTV):** A computer-generated tool to identify the likely (or theoretical) extent of visibility of a development. The elevation (or a set of elevations) of the development is tested against a 3D terrain model.

#### 1.4 Chapter 7: Water Environment

- **Alluvial Fan Deposits:** Fan-shaped deposits of water-transported material (alluvium)
- **Alluvium:** A deposit of clay, silt, and sand left by flowing floodwater in a river valley or delta
- **Aquifer:** An underground layer of water-bearing permeable rock, rock fractures or unconsolidated materials (gravel, sand, or silt)
- **Bankfull:** The water level stage that just begins to spill out of the channel into the floodplain
- **Bedrock:** Hard rock that lies below sand, gravel and soil near the ground surface
- **Bedrock Aquifer:** An aquifer that is confined within hard bedrock layers
- **Diamicton:** A terrigenous sediment (a sediment resulting from dry-land erosion) that is unsorted to poorly sorted and contains particles ranging in size from clay to boulders, suspended in a matrix of mud or sand
- **Downhole:** Relating to measurements taken along the length of a borehole
- **Flow Regime:** The way the water moves through the river or stream (e.g. smooth flow, ripples, rough water)
- **Fluvial:** Of, or relating to, a river or stream
- **Fluvial Processes:** Processes of a river or stream
- **Fractures:** A crack or break in the rock
- **Fracture Density:** A measure of the number of fractures on borehole walls
- **Geology:** The science which deals with the physical structure and substance of the earth, their history, and the processes which act on them
- **Geomorphology:** The study of physical features of the Earth (e.g. rivers, deserts, mountains, glaciers) and the processes by which they are formed or altered
- **Hydraulic Conductivity:** A property that describes the ease with which a fluid can move through pore spaces or fractures
- **Interbedded:** (of strata) Embedded among or between others
- **Lithology:** The study of the general physical characteristics of rocks
- **Log:** A record of downhole measurements
- **Members and Beds:** The main lithostratigraphic ranks in the lithostratigraphy (rock stratigraphy) hierarchy are: Supergroup, Group, Formation, Member and Bed
- **Morphological Features:** In the context of the water environment, the physical structure of a river or stream such as bends, banks and bed
- **Overflow:** A pipe that flows into a river or stream and that takes water from roads, houses or water treatment works
- **Packer Test:** A technique in which one or more inflatable bladders, or packers, are used to isolate different regions of a borehole for hydraulic testing or water sampling



- **Permeability:** A measure of the ability of a porous material to allow fluids to pass through it
- **Planform:** In the context of the water environment, the appearance of a river or stream from above (e.g. if it is straight or has bends)
- **Pools:** A deeper area of water in a river or stream
- **Qmed:** A flood that would occur once every two years on average and would be approximately bankfull
- **Riffles:** A shallower area of water in a river or stream, usually filled with rocks or pebbles where the water flows brokenly
- **Spring:** A natural flow of water from the ground or from rocks
- **Strata:** A series of layers of rock in the ground
- **Stratigraphic Unit:** A volume of rock of identifiable origin and relative age range that is defined by the distinctive and dominant, easily mapped and recognizable petrographic, lithologic or palaeontological features that characterise it
- **Superficial Aquifer:** A groundwater body existing within the topmost geological strata in superficial deposits
- **Sustainable Drainage System (SuDS):** A drainage solution that provides an alternative to the direct channelling of surface water through networks of pipes and sewers to nearby watercourses
- **Till:** Unsorted material deposited directly by glacial ice and showing no stratification
- **Uniform Channel:** A river or stream that is symmetrical
- **Water Body:** Any significant accumulation of water
- **Watercourse:** A channel in which water flows (e.g. river, stream, canal).
- **National Scale:** At the scale of the whole country
- **Not known:** Stands for Not Applicable, meaning there is no information
- **Nuclear Magnetic Resonance:** A quantitative geophysical method that can be used to make in-situ assessments of porosity, water content, mobile and immobile water fraction, and estimates of permeability
- **Permanent works:** Anything that would not be removed once everything has been built (for example, the aqueduct, or access tracks that are still needed to get to the aqueduct)
- **Site Buildings:** Buildings such as offices and welfare facilities used by the personnel building the aqueduct
- **Site Compounds:** The area used to keep equipment and building materials while the aqueduct is being built. Also, the location of site buildings
- **Spring:** A natural flow of water from the ground or from rocks
- **Strata:** A series of layers of rock or sediments in the ground
- **Temporary works:** Anything that would be removed once the aqueduct has been built (for example, storage areas for building materials, or temporary access roads built to get to the site).

## 1.5 Chapter 8: Flood Risk

- **Annual Exceedance Probability (AEP):** Annual Exceedance Probability (AEP) refers to the probability of a flood event occurring in any year. The probability is expressed as a percentage. For example, a large flood which may be calculated to have a 1 % chance to occur in any one year, is described as 1 %AEP

- **Attenuation:** The process of storing and slowly releasing surface water runoff, one of the key features of sustainable drainage systems (SuDS). By slowing down the rate at which surface water enters sewers or watercourses, the risk of downstream flooding is reduced
- **Catchment:** A water catchment is a distinct, defined area of land within which water drains into a body of water (such as a river, lake or reservoir, or even into underground water supplies – 'groundwater')
- **Check Dams:** A small dam constructed across a drainage ditch, swale, or channel to lower the velocity of flow. Reduced runoff velocity reduces erosion and gullyng in the channel and allows sediments to settle out. A check dam may be built from stone, sandbags filled with pea gravel, or logs
- **Cross Drains:** A cross drain moves water across a road to prevent accumulation of flow
- **Culvert:** A closed pipe carrying a watercourse beneath an obstruction such as a road, railway or canal. The term 'closed' implies that a culvert has a hard soffit (top) and invert (base). Culverts can be circular or rectangular in cross-section
- **Dewatering:** The removal of water. The term generally applies to deep excavations that often fill with groundwater
- **Flood Zone 1:** Land assessed by the Environment Agency as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1 %)
- **Flood Zone 2:** Land assessed by the Environment Agency as having between a 1 in 100 (1 %) and a 1 in 1,000 (0.1 %) annual probability of river flooding; or land having between a 1 in 200 (0.5 %) and a 1 in 1,000 (0.1 %) annual probability of sea flooding
- **Flood Zone 3a:** Land assessed by the Environment Agency as having a 1 in 100 or greater annual probability of river flooding (>1 %), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5 %) in any year
- **Flood Zone 3b:** A zone that comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and their boundaries accordingly, in agreement with the Environment Agency
- **Fluvial Flooding:** A fluvial, or river, flood occurs when the water level in a river, lake or stream rises and overflows onto the surrounding banks, shores and neighbouring land
- **Groundwater Flooding:** The emergence of groundwater at the ground surface away from perennial river channels or the rising of groundwater into man-made ground, under conditions where the 'normal' ranges of groundwater level and groundwater flow are exceeded
- **Main River:** Main Rivers are usually larger rivers and streams. The Environment Agency carries out maintenance, improvement or construction work on Main Rivers to manage flood risk
- **Ordinary Watercourse:** Any watercourse that is not designated as a Main River is an Ordinary Watercourse
- **Reservoir Flooding:** Flooding resulting from the sudden release of water from a reservoir
- **Risk Management Authority:** An organisation that has a responsibility to manage flooding as defined under the Flood and Water Management Act 2010
- **Surface Water Flooding:** Flooding caused by water flowing overland that has not yet entered a watercourse or sewer
- **Swale:** A low-lying or depressed and often wet stretch of land
- **Tributary:** A river or stream flowing into a larger river.

## 1.6 Chapter 9: Ecology

- **ASNW:** Ancient Semi-Natural Woodland.

- **BAP:** Biodiversity Action Plan.
- **BCT:** Bat Conservation Trust.
- **Bern Convention:** Bern Convention on the Conservation of European Wildlife and Natural Habitats 1979 – the obligations of the Convention are transposed in the UK into national law by means of the Wildlife and Countryside Act 1981 as amended (WCA).
- **BHS:** Biological Heritage Site - non-statutory designated wildlife site in Lancashire.
- **BNG:** Biodiversity Net Gain - an approach to development that leaves biodiversity in a better state than before.
- **BoCC:** Bird of Conservation Concern - bird species identified as being of conservation concern by inclusion on the red or amber lists of bird species in the UK, Channel Islands and Isle of Man.
- **Bonn Convention:** Bonn Convention on the Conservation of Migratory Species of Wild Animals 1979 - the obligations of the Convention are transposed in the UK into national law by means of the Wildlife and Countryside Act 1981 as amended by the Countryside and Rights of Way Act 2000 strengthening the protection of certain species in England and Wales.
- **BSBI:** Botanical Society of Britain and Ireland.
- **BTO:** British Trust for Ornithology.
- **CEMP:** Construction Environmental Management Plan.
- **CIEM:** Chartered Institute of Ecology and Environmental Management.
- **Countryside and Rights of Way Act 2000 (CRoW):** Part III deals specifically with wildlife protection and nature conservation, requiring Government Departments to have regard for the conservation of biodiversity. It also amends and strengthens certain protections afforded by the WCA.
- **DBA:** Desk-based assessment.
- **EclA:** Ecological Impact Assessment – the evaluation of the biophysical effects of a project on valued ecological features.
- **Ecological Effect:** An effect that results in biophysical change(s) within an ecological feature.
- **eDNA:** Environmental DNA – residual biological material which can be detectable, applying appropriate protocols for sampling and analysis, to confirm presence of a specific target organism. For example, eDNA survey is now a widely adopted standard method for confirming presence or likely absence of great crested newts within a sampled water body and to determine species identification from bat droppings.
- **EPS:** European Protected Species.
- **EPSL:** European Protected Species Licence.
- **EUROBATS:** Conservation of Populations of European Bats 1991 – came into force in the UK in 1994 as a legally binding agreement under the Bonn Convention.
- **FCS:** Favourable Conservation Status – the conservation status of a natural habitat is defined by the Habitats Directive as favourable when: (a) its natural range and areas it covers within that range are stable or increasing, and (b) the species structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and (c) the conservation status of its typical species is favourable. The conservation status of a species is defined by the Habitats Directive as favourable when (a) population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, (b) the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and (c) there is, and will probably continue to be, a sufficiently large habitat to maintain its population on a long-term basis.
- **FISC:** Field Identification Skills Certificate.

- **GBA:** Ground-based assessment of trees for bat roost suitability.
- **GMBAP:** Greater Manchester Biodiversity Action Plan.
- **GMEU:** Greater Manchester Ecology Unit.
- **GPS:** Global Positioning Software.
- **GWDTE:** Groundwater Dependent Terrestrial Ecosystems – wetland ecosystems that rely on groundwater flows and / or chemistries for their continued existence.
- **Habitats Directive:** Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora – referenced by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (e.g. provides definitions for factors such as the favourable conservation status of habitats and species).
- **Habitats Regulations:** The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 provide for the identification, designation and protection of a National Network of Sites and convey a statutory requirement for authorities to undertake a Habitats Regulations Assessment of the potential impacts of plans and projects, including development proposals, on these sites. The Regulations also convey strict levels of protection to certain species and their habitats or places of shelter. Derogations are afforded for such species through granting of licences, which must satisfy three tests relating to purpose and no satisfactory alternative for the proposed activity and maintaining favourable conservation status (FCS) of the affected species.
- **Hedgerows Regulations 1997:** Regulations that protect certain 'important' hedgerows from removal or damage without permission from the local planning authority. Works to important hedgerows are exempt under the Regulations if planning consent is granted which allows their removal.
- **HPI:** Habitat of Principal Importance (for biodiversity conservation) – Section 41 of the NERC Act (see Natural Environment and Rural Communities Act 2006 below) provides for the establishment of a list of habitat and species that are considered to be of "*principal importance for the purpose of conserving biodiversity*" for which biodiversity conservation should be prioritised.
- **HRA:** Habitats Regulations Assessment.
- **IAW:** Inventory of Ancient Woodland.
- **IBA:** Important Bird Areas – The IBA Programme of BirdLife International is a worldwide initiative aimed at identifying and protecting a network of sites, critical for the conservation of the world's birds, with sites selected on the basis of the bird numbers and species complements they hold. IBAs are particularly important for species that congregate in large numbers, such as wintering and passage waterbirds and breeding seabirds. Many sites have also been identified for species of global and European/EU conservation concern.
- **IPA:** Important Plant Areas – the IPA programme of Plantlife for the UK provides a framework for identifying and maintaining the richest sites for plant life, possibly within existing protected areas. Though the protection of the IPA itself is not legally enforced, the programme is intended to inform and underpin existing international, regional and national conservation programmes and legislation.
- **IWS:** Important Wildlife Site – non-statutory designated wildlife site.
- **LBAP:** Lancashire Biodiversity Action Plan.
- **LERN:** Lancashire Environmental Records Centre.
- **LNR:** Local Nature Reserve.
- **Lotic-invertebrate Index for Flow Evaluation (LIFE):** The Lotic-invertebrate Index for Flow Evaluation is an index for identifying the prevailing flow regimes within a watercourse from the macroinvertebrate taxa present. This is an index designed for British waters.
- **Mitigation Hierarchy:** A set of steps for achieving no net loss of biodiversity – the mitigation hierarchy dictates the following process: Step 1 potential negative impacts are assessed and then avoided to

the greatest extent possible; Step 2 unavoidable impacts are minimised; Step 3 as a last resort, where significant effects remain following avoidance or minimisation measures, residual negative impacts are compensated or offset. Typically, offsets aim to deliver greater biodiversity values (in terms of habitat area or quality) than those that have been lost, in order to achieve net gain.

- **National Parks and Access to the Countryside Act 1949 (NPAC):** Enables the establishment and management of nature reserves.
- **National Vegetation Classification (NVC):** A standardised system for the classification of the plant communities of Britain, each systematically named and arranged and with standardised descriptions for each.
- **Natural Environment and Rural Communities Act 2006 (NERC):** Imposes a duty on all public bodies to have regard for biodiversity conservation when carrying out their functions, extending the duty imposed upon Government and Ministers by CRoW (see Countryside and Rights of Way Act 2000 above).
- **NNIS:** Non-native invasive species.
- **NNR:** National Nature Reserve.
- **Phase 1:** Standardised system for recording and mapping of wildlife habitats in all parts of Great Britain, including urban areas.
- **PHI:** Priority Habitat Inventory.
- **Potential (Bat) Roost Feature (PRF):** A feature in or on a tree, building or structure which has characteristics that offer suitable roosting conditions for single or multiple bats for short or prolonged periods.
- **Proportion of Sediment-sensitive Invertebrates (PSI):** A biomonitoring tool that is designed to identify the degree of sedimentation in rivers and streams.
- **Protection of Badgers Act 1992 (PBA):** A statutory instrument protecting badgers and their setts.
- **RAM:** Reasonable Avoidance Measure.
- **Ramsar:** Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 – an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.
- **Red Data List:** National or regional biodiversity lists of rare, scarce, endangered and / or protected species.
- **Residual Ecological Effects:** Those impacts of the proposed development that cannot be mitigated for, following implementation of mitigation measures.
- **Reversibility:** The permanence or otherwise of an ecological effect. A permanent impact is one from which recovery is not possible within a reasonable timescale, a temporary impact is one from which spontaneous recovery is possible, or for which effective mitigation is possible within a reasonable timescale.
- **RSPB:** Royal Society for the Protection of Birds.
- **SAC:** Special Area of Conservation.
- **SBI:** Site of Biological Importance - non-statutory designation used by some local planning authorities to protect locally-valued sites of biological diversity described as local wildlife sites by the UK Government.
- **Sch1:** Bird species listed on Schedule 1 of the WCA.
- **Sch5:** Animal species listed on Schedule 5 of the WCA.
- **Sch8:** Plant species listed on Schedule 8 of the WCA.

- **Sch9:** Non-native invasive species listed on Schedule 9 of the WCA.
- **Sensitivity (Ecological):** The susceptibility of an ecological feature to the specific type of biophysical change predicted to result as a consequence of the development activity proposed.
- **Significant (Ecological) Effect:** An effect that either supports or undermines the biodiversity conservation objectives for important ecological features or for biodiversity in general – an assessment of significance encompasses impacts upon the structure, composition and function of defined sites, habitats or ecosystems or upon the conservation status of habitats and species.
- **SPA:** Special Protection Area.
- **SPI:** Species of Principal Importance (for biodiversity conservation) – Section 41 of the NERC Act provides for the establishment of a list of habitats and species that are considered to be of "*principal importance for the purpose of conserving biodiversity*" for which biodiversity conservation should be prioritised.
- **SSSI:** Site of Special Scientific Interest.
- **Target Note (TN):** Recorded to describe species composition of a habitat or to record a feature of note during extended Phase 1 habitat survey.
- **Value:** The importance of an ecological feature based on its inclusion on lists of important sites, habitats or species (statutory and non-statutory) and / or on the basis of expert judgement, due to local rarity, ecological function, relative species richness or population or other factors.
- **Whalley Hawkes Paisley Trigg (WHPT):** A biotic index that enables the assessment of invertebrates in rivers (in relation to general degradation, including organic pollution).
- **WHPT ASPT:** Average WHPT score of all invertebrates in a sample.  $WHPT\ ASPT = \frac{\text{Sum } AB}{WHPT\ N\text{-Taxa}}$  Where AB = value for each taxon according to its abundance. N-Taxa is the number of taxa contributing to the assessment.
- **WHPT N-Taxa:** The number of scoring invertebrate taxa within a sample. This gives an indication of invertebrate diversity.
- **Wildlife and Countryside Act 1981 as amended (WCA):** The major legal instrument for wildlife protection in the UK.

## 1.7 Chapter 10: Cultural Heritage

- **CIfA:** Chartered Institute for Archaeologists.
- **HER:** Historic Environment Record.
- **LCC:** Lancashire County Council.
- **NHLE:** National Heritage List for England.
- **NPPF:** National Planning Policy Framework.
- **NPPG:** National Planning Practice Guidance.

## 1.8 Chapter 11: Soils, Geology and Land Quality

- **Alluvium:** Clay, silt, sand and gravel that has been transported and deposited by a moving body of water such as a river or stream
- **Artificial Geology:** Where the ground surface has been significantly modified by human activity
- **Bedrock Geology:** The main mass of rocks forming the Earth that are present everywhere, whether exposed at the surface in outcrops or present beneath superficial deposits or water
- **Craven Group:** A sequence of mudstone and limestone rock strata
- **Devensian:** The last glacial period

- **GeoLancashire:** A geological conservation group working to record and look after important geological sites in Lancashire
- **Glacial Till:** Unsorted material that has been deposited by a glacier. The content may vary and can include clay, sand, gravel and boulders
- **Hummocky Glacial Deposits:** Glacial deposits that have a random, rounded form, commonly composed of rock debris, clayey till, and sand and gravel
- **Limestone:** A sedimentary rock primarily composed of calcium carbonate
- **Made Ground:** Ground and deposits derived from human activity rather than natural processes
- **Millstone Grit Group:** A group of rock comprising sandstones interbedded with siltstones and mudstones
- **Mineral Safeguarding Area:** An area of known deposits of minerals which are desired to be kept safeguarded from sterilisation by non-mineral development
- **Mudstone:** A sedimentary rock composed of silt and clay-sized particles
- **Peat:** An organic rich material
- **Radon:** A colourless, odourless radioactive gas formed by the radioactive decay of the small amounts of uranium that occur naturally in rocks and soils
- **Sandstone:** A sedimentary rock composed of sand-sized grains
- **Shale:** A sedimentary rock formed from the compaction of clay, silt, mud and organic matter
- **Siltstone:** A sedimentary rock composed of silt
- **Silurian:** A period of geological time
- **Superficial Geology:** The youngest geological deposits typically formed during most recent period of geological time.
- **Glaciolacustrine Deposits:** Deposits which were laid down in glacial lakes and commonly comprise sands, silts and clays
- **Grit:** A sedimentary rock consisting of sand grains and small pebbles
- **Head Deposits:** Poorly sorted deposits consisting of clay, silt, sand and gravel, which have moved downslope
- **River Terrace Deposits:** Generally comprise sand and gravel deposits and exist on level surfaces around rivers and streams.
- **Till:** Unsorted material that has been deposited by a glacier. The content may vary and include clay, sand, gravel and boulders.

## 1.9 Chapter 12: Materials and Waste

- **Arisings:** Materials mainly comprising inert rock that would be brought to the surface from tunnel excavations
- **CL:AIRE:** Contaminated Land: Applications in Real Environments
- **Inert Waste:** Inert waste is waste which is neither chemically nor biologically reactive and will decompose very slowly or not at all. Examples of this are sand and concrete. This has particular relevance to landfills as inert waste typically requires lower disposal fees than biodegradable waste or hazardous waste
- **MMP:** Materials Management Plan
- **MWLP:** Minerals and Waste Local Plan

- **Surplus Excavated Material:** Material excavated during the construction of the Proposed Marl Hill Section that would be inert or would be remediated to achieve inert criteria having undergone appropriate on-site treatment, capable of transportation and not required to be re-used to complete construction
- **SWMP:** Site Waste Management Plan
- **Underlying Geology:** The bedrock, rock type, structure and geologic history of an area
- **WRAP:** Waste Resources Action Programme.

### 1.10 Chapter 13: Public Access and Recreation

- **NCN:** National Cycle Network
- **PRoW:** Public Right of Way.

### 1.11 Chapter 14: Communities and Health

- **Bedspace Stock:** Visit Britain regularly undertakes an accommodation census to measure accommodation stock. Data are collected on the number of establishments, bedrooms and bedspaces. The bedspace stock data provide estimates of the number of individual bedspaces available within the tourism accommodation stock within a given area
- **Community Receptors:** Community receptors include residential properties, social infrastructure (schools, hospitals, GPs) and commercial operations (businesses)
- **Construction Traffic Management Plan (CTMP):** A document containing agreed protocols and mitigation measures to manage any negative effects associated with construction traffic movements on the highway network. Three CTMPs are submitted in support of the planning application for the Proposed Marl Hill Section, one for each Haulage Route Option. The CTMP for the Haulage Route Option taken forward as part of any approved scheme would be further developed, subject to planning consent, as the detailed designs progress and the HARP contractor is appointed
- **Disturbance Effects:** Where environmental effects arising from the proposed development could result in disturbance or disruption to local communities
- **Health Determinants:** Causes of illness and well-being. According to the World Health Organization the determinants of health include: the social and economic environment, the physical environment, and the person's individual characteristics and behaviours
- **Health Outcome:** Positive or negative changes in health due to an intervention, policy, programme or project
- **Human Health:** The World Health Organization defines in its Constitution human health as "*a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*"
- **Local Community Assessment Area (LCAA):** The area defined by a 1 km boundary around the compounds serving the Proposed Marl Hill Section excluding the indicative corridor for the transport routes
- **Lower Layer Super Output Area (LSOA):** A small geographical area used by the Office for National Statistics for the collection and publication of statistical data
- **PRoW:** Public Rights of Way
- **Public Health England (PHE):** Executive agency of the Department of Health and Social Care in England
- **Regional Community Assessment Area (RCAA):** Defined as the Ribble Valley Borough Council area
- **Severance:** The extent to which members of communities are able (or not able) to move around their community and access services / facilities



- **Travel to Work Area (TTWA):** A statistical tool used by UK Government agencies and local authorities, especially by the Department for Work and Pensions and Jobcentres, to indicate an area where the population would generally commute to a larger town, city or conurbation for the purposes of employment.

## 1.12 Chapter 15: Major Accidents

- **Control of Major Accident Hazard (COMAH) facilities:** operational establishments which are subject to COMAH Regulations 2015 because certain dangerous substances are present at or above the qualifying thresholds in the Regulations
- **Disaster:** Extremes of natural occurrences, such as a major flood event or earthquake
- **Extreme incidences:** those that could result in serious environmental effects to human health, welfare and/or the environment
- **Health and Safety Executive (HSE):** A UK government agency responsible for the encouragement, regulation and enforcement of workplace health, safety and welfare
- **Major accident:** An undesirable extreme event resulting in damage or harm, such as a major pollution incident
- **Major Accident Hazard Pipelines (MAHPs):** A pipeline in which a dangerous fluid within the scope of the Pipelines Safety Regulations 2006 is being or is to be conveyed
- **Seismicity:** Factor of how seismic a region is i.e. how prone it is to earthquakes
- **Standard Operating Procedures (SOP):** A set of clear, written directions for how to complete complex routine tasks
- **Vulnerability:** The 'exposure and resilience' of a project to the risk of a major accident or natural disaster.

## 1.13 Chapter 16: Transport Planning

- **ATC:** Automatic Traffic Count
- **Construction Traffic Management Plan (CTMP):** A document containing agreed protocols and mitigation measures to manage any negative effects associated with construction traffic movements on the highway network. The CTMPs for the Proposed Marl Hill Section are presently draft documents but would be further developed, subject to planning consent, as the detailed designs progress and the HARP contractor is appointed
- **DfT:** Department for Transport
- **Do Minimum (DM) Scenario:** The future traffic scenario without the Proposed Marl Hill Section but with the traffic associated with any committed development
- **Do Nothing (DN) Scenario:** The future traffic scenario without the Proposed Marl Hill Section and also without the traffic associated with any committed developments
- **Do Something (DS) Scenario:** The future traffic scenario with the Proposed Marl Hill Section and also including traffic associated with any committed developments
- **ECl:** Early Contractor Involvement
- **HE:** Highways England
- **HGV:** Heavy Goods Vehicle
- **IEMA:** Institute for Environmental Management and Assessment
- **Interim Travel Plan:** A mitigation measure to manage the number of employee vehicle movements to construction sites, and to ensure they are contained within the construction compounds
- **LGV:** Light Goods Vehicle

- **LHA:** Local Highways Authority
- **MCC:** Manual Classified Count
- **NTM:** National Transport Model
- **PRoW:** Public Rights of Way
- **SPA:** Swept Path Analysis
- **Strategic Road Network (SRN):** Managed by Highways England, comprising motorways and some A roads
- **TA:** Transport Assessment
- **TEMPro:** Trip End Model Presentation Program – tool used to obtain traffic growth factors nationally, and adjustable to local conditions
- **TfGM:** Transport for Greater Manchester
- **Trip End Model Presentation Program (TEMPro):** A tool used to obtain traffic growth factors nationally, and adjustable to local conditions
- **TRO:** Traffic Regulation Order
- **TVM:** Theoretical Vehicle Movements
- **WebTRIS:** Highways England network journey time and traffic flow online database.

#### 1.14 Chapter 17: Noise and Vibration

- **Decibel, dB:** A widely used unit in acoustics. This is the logarithmic ratio between the measured level of sound and a reference level (0 dB).
- **Equivalent Continuous Sound Level:** The equivalent continuous sound level ( $L_{eq}$ ) is a widely used parameter for assessing environmental noise. Since this descriptor is a type of average level, it must by definition have a time period over which the measurement is assigned. This is often included in the abbreviation in the form  $L_{eq,T}$ , where T is the time period (i.e.  $L_{Aeq,5min}$ ). In practice, since most modern sound level meters are digital and hence take periodic samples of the sound pressure level, the  $L_{eq}$  will be the logarithmic average of all the sound pressure level samples taken in the measurement period.
- **Façade Noise Level:** A noise level that has been measured or predicted 1 m in front of the most exposed window or door in a façade.
- **Free Field Noise Level:** A noise level that has been measured or predicted in the absence of any influence of reflections from nearby surfaces. In practice, a measurement is considered to be free field if it is taken at a distance of over 3.5 m from any reflecting surfaces.
- **Groundborne Noise and Vibration (GBNV):** Where vibration that is propagated through the ground is transmitted into foundations, resulting in vibration in parts of the building, such as walls, floors and ceilings. Audible sound waves may also be produced by the vibrations in the building elements, which results in groundborne noise.
- **$L_{max}$ :** The maximum sound level recorded during a measurement period.
- **Loudness:** A listener's subjective response to the character of an observed sound. It is related to the objective sound pressure level and the frequency of the sound.
- **$L_{10}$ :** The level exceeded for 10 % of the measurement period and widely considered as the standard index to describe traffic noise.
- **$L_{90}$ :** The level exceeded for 90 % of the measurement period and widely considered to represent background sound, or the underlying sound in an area between noisy events (such as cars passing).
- **LOAEL:** The level above which adverse effects on health and quality of life can be detected.

- **NOEL:** The level below which no effect can be detected.
- **Noise:** Noise has been defined in a variety of ways and is very much dependent on factors such as the listener's attitude to the source of the sound, and the environment, but is essentially any sound that is unwanted by the recipient.
- **Peak Particle Velocity:** Defined in the International Electrotechnical Commission (IEC) Standard 801-21-30 as the greatest instantaneous particle velocity during a given time interval.
- **SOAEL:** The level above which significant adverse effects on health and quality of life occur.
- **Sound Pressure Level:** The sound pressure level (LP or SPL) is the instantaneous acoustic pressure and is measured in decibels (dB). Since the ear is sensitive to variations in pressure, rather than source power or intensity, the measurement of this parameter gives an indication of the impact on people.
- **Weighting of Sound Pressure Levels:** The response of the human ear is not constant over all frequencies. Therefore, it is usual to weight the measured frequency to approximate human response. This is achieved by using filters to vary the contribution of different frequencies to the measured level. The 'A' weighting network is the most commonly used and has been shown to correlate closely to the non-linear and subjective response of humans to sound. The use of this weighting is denoted by a capital 'A' in the unit abbreviation (e.g.  $L_{Amax}$ ,  $L_{Aeq}$ ,  $L_{A90}$ ) or a capital 'A' in brackets after a dB level (e.g. 3 dB(A)).

## 1.15 Chapter 18: Air Quality and Climate Change

- **Affected Road Network (ARN):** Those road links affected by changes in road traffic (i.e. the changes exceed the criteria for defining the affected roads as set out in the DMRB LA 105 Air Quality guidance)
- **Air Quality Management Area (AQMA):** An area within a local authority's boundary that is identified as an area where Air Quality Objectives are not likely to be achieved
- **Air Quality Objectives (AQOs):** Defined levels of air quality and maximum pollution limits as specified in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2007
- **Ammonia (NH<sub>3</sub>):** An air pollutant that is mostly emitted from agriculture involving livestock and fertilizer use. It can also be emitted from combustion processes where ammonia / urea is injected into the combustion gases to reduce NO<sub>x</sub> emissions (e.g. in selective catalytic reduction (SCR) systems)
- **Annual Average Daily Traffic (AADT):** Total volume of vehicle traffic on a road flowing past a certain point over a year divided by 365 days
- **Atmospheric Dispersion Modelling System (ADMS):** An advanced atmospheric pollution dispersion model for calculating ground level concentrations of atmospheric pollutants
- **Carbon Monoxide (CO):** An air pollutant which is produced when fuels containing carbon are burned with insufficient oxygen to convert all carbon inputs to carbon dioxide (CO<sub>2</sub>)
- **Defra:** UK Government Department for Environment, Food & Rural Affairs
- **Dispersion Modelling:** The mathematical simulation of how air pollutants disperse in the ambient atmosphere. A dispersion model is used to estimate or predict the downwind concentration of air pollutants emitted from sources such as industrial facilities or road traffic
- **Do Minimum (DM) Scenario:** The future traffic scenario without the Proposed Marl Hill Section but with the traffic associated with any committed development
- **Do Nothing (DN) Scenario:** The future traffic scenario without the Proposed Marl Hill Section and also without the traffic associated with any committed developments
- **Do Something (DS) Scenario:** The future traffic scenario with the Proposed Marl Hill Section and also including traffic associated with any committed developments

- **Environmental Assessment Level (EAL):** Environmental Assessment Levels (EALs) are used by the Environment Agency to judge the acceptability of proposed emissions to air from industrial sites, and their relative contribution to the environment. EALs represent a pollutant concentration in ambient air at which no significant risks to human health are expected
- **Environmental Quality Standards (EQS):** Relevant air quality standards and guidelines for the protection of human health. Used to represent the relevant AQOs or EAL for reporting purposes
- **European Designated Site:** The generic term used to describe ecological sites with a Special Area of Conservation (SAC) and Special Protection Area (SPA) designation. Ramsar designation, an international designation, has been included under this term for ease of reference
- **Heavy Duty Vehicle (HDV):** A vehicle with a gross weight of more than 3.5 tonnes or a bus
- **Institute of Air Quality Management (IAQM):** A professional body for air quality experts in the UK
- **Local Air Quality Management (LAQM):** A process that requires local authorities across the UK to review, assess and manage the air quality within their geographical areas
- **Locally Designated Site:** The generic term used to describe ecological sites designated as a National Nature Reserve (NNR), Local Nature Reserve (LNR), or Local Wildlife Site (LWS) (including other designations deemed sensitive by the scheme ecologist or local authorities, e.g. County Wildlife Site (CWS), Ancient Woodland (AW))
- **Micrograms Per Cubic Metre ( $\mu\text{g}/\text{m}^3$ ):** The principal unit of measurement for the concentration of an air pollutant in ambient air
- **Nationally Designated Site:** The generic term used to describe ecological sites such as Sites of Special Scientific Interest (SSSI) with a national level of designation
- **Nitrogen Dioxide ( $\text{NO}_2$ ):** An air quality pollutant measured in respect of Defra's AQOs for the protection of human health.  $\text{NO}_2$  is gas that is released into the atmosphere when fossil fuels are burned (e.g. petrol or diesel in a car or generator engine)
- **Oxides of Nitrogen ( $\text{NO}_x$ ):** Together, nitric oxide and nitrogen dioxide are known as oxides of nitrogen. They are released into the atmosphere when fossil fuels are burned
- **Particulate Matter ( $\text{PM}_{10}$ ):** Particulate matter with an aerodynamic diameter of 10 microns or less. The main source of particulate matter emissions in the UK is combustion, for example vehicles and power stations. Other human sources include mining, quarrying and industrial processes. Natural sources include wind-blown dust, soil particles and sea salt
- **Particulate Matter ( $\text{PM}_{2.5}$ ):** Particulate matter with an aerodynamic diameter of 2.5 microns or less (see also  $\text{PM}_{10}$ )
- **Pollution Climate Mapping (PCM):** The PCM model is a collection of models designed to fulfil part of the UK's EU Directive (2008/50/EC) requirements to report on the concentrations of particular pollutants in the atmosphere. These models are run by Ricardo Energy & Environment on behalf of Defra
- **Predicted Environmental Concentrations (PECs):** The maximum modelled concentration (PC) combined with estimated background concentration
- **Process Contributions (PCs):** The maximum modelled concentrations due to the emissions from the additional road traffic (annual mean only) and / or diesel generators
- **Sulphur Dioxide ( $\text{SO}_2$ ):** An air pollutant which primarily arises from anthropogenic activities and, more specifically, combustion of fuels containing sulphur and sulphur compounds (e.g. fuel oils and diesel).