

Our Ref: B023905

Date: 27 April 2021

Mrs Judith Jones

Head of Planning
Planning & Countryside Division
Merthyr Tydfil County Borough Council
Unit 5 Triangle Business Park
Pentrebach
Merthyr Tydfil
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Dear Mrs Jones

**Proposed mixed leisure development on land at Rhydyar West, Merthyr Tydfil
Environmental Impact Assessment (Wales) Regulations 2017
Regulation 14: Request for a Scoping Opinion**

Introduction

We write in connection with a forthcoming planning application for mixed leisure development at the above site.

This letter analyses the character of the site and its context, describes the proposed development, and considers the impact of the development in connection with the current EIA Regulations, including specific appendices in respect of:

1. Community and Socio-Economic
2. Sustainability and Climate Change
3. Ground Conditions
4. Ecology
5. Transportation and Movement
6. Heritage
7. Hydrology and Hydrogeology
8. Arboriculture
9. Townscape and Landscape
10. Noise, Acoustics & Vibration
11. Air Quality
12. Lighting
13. Services and Energy
14. Waste

We consider the development falls under Schedule 2(10)(b) and (12) (a), (c) and (e) of the Regulations and consider that in terms of the proposed character, location and potential impact, the development will have likely significant environmental effects. In light of this, we consider that the proposed development represents EIA development. The purpose of this letter is to formally request a Scoping Opinion in order to inform the production of the Environmental Statement.

In line with requirements set out in Regulation 14(2)(a), the following is provided:

- a site location plan, sufficient to identify the land (drawing ref: 91-003-P1-EIA Scoping Area);
- a description of the nature and purpose of the development, including location and capacity;
- the likely significant effects of the development on the environment;
- related information.

We trust you will consult the necessary consultees (Regulation 14(4)) and we look forward to receiving your Scoping Opinion in due course. It would be helpful if this could identify any developments we should take account of in respect of cumulative impact, including any planning reference numbers, as required.

Site and Surroundings

The site comprises 37ha and is located south west of the A470/A4102 roundabout. The principal access into the site is taken from the A470/A4102 roundabout. An emergency/delivery/service vehicular access is available via an underpass from Abercanaid Industrial Estate in the far south-east of the site. Pedestrian access is also available over the A470 in two locations. No public rights of way currently run through any part of the existing site, albeit claimed rights of way exist, some of which are likely to be established as a result of positive dialogue and collaboration between the landowners and MTCBC (despite the Covid-19 Pandemic restrictions). A joint Statement of Common Ground will be issued shortly. In addition, positive collaboration between the Landowner and MTCBC has facilitated the establishment of a new public right of way on the land to create public access to the Merthyr-Abernant Tunnel. It is an ambition of MTCBC, Welsh Government and the landowners that the tunnel be reopened to walkers and cyclists as an exciting and important part of reviving the rich heritage legacy of the site.

The site comprises an extensive area, forming a mix of woodland/grassland on predominantly east and south-east -facing slopes in the north and west which is more open in appearance. The southern area of the site comprises a more enclosed woodland area. The Blaen-Canaid Valley lies to the south adjacent to Gethin Wood. The landform undulates with moderate to steep slopes and falls from circa 270m AOD in the west to between 175-200m AOD along the A470 which forms the lower level.

The surrounding area has a mixed-use character and the location of the site is highly accessible with numerous employers/jobs, shops, services and community facilities accessible by means of bus and rail, as well as an abundance of facilities within walking and cycling distance. In summary its proximity at the heads of the Valley makes it a unique Gateway location to explore Wales. To the north lies the residential settlement of Heolgerrig, approximately 1.5km distant. The settlement is served by a number of community facilities. The town centre of Merthyr Tydfil sits just over 1 km walking distance to the east.

In regard to accessibility, the Taff Trail cycle route runs to the east of the A470 and forms part of the wider strategic cycle network. A number of bus stops are located within proximity of the site, which includes:

- Heolgerrig Bus Stops
- Keir Hardie Health Park Bus Stops
- Merthyr Tydfil Leisure Centre Bus Stop
- Penlan View Bus Stops; and
- Quay Row Bus Stops.

The stops benefit from a regular level of services which operate Monday to Saturday, providing connections to the town centre and wider parts of Merthyr Tydfil.

Merthyr Tydfil train station is located within the town centre and provides regular links to surrounding Settlements. Pentre-Bach Railway Station is an alternative option for future site users.

The site has historically been subject to coal and iron ore extraction and remains affected to differing extents by mining legacies, as well as legacies associated with the construction of the A470. Some spoil tips and derelict shallow workings therefore remain and a number of disused former tramways and tracks and other associated structures occupy the site.

Rhydyar West is rich in heritage as an area that contributed to Merthyr's key role in the industrial revolution. The site's plentiful supplies of iron and coal contributed significantly to the industrial revolution and beyond, up until the mid-20th Century. Prior to that, the land was an important site related to the period of religious dissent in Wales. Important remains of this history are scattered across the site. Unfortunately, some of these are degrading and disappearing.

Ever mindful of this background and the wider context, Marvel have sought from the outset to recognise and cherish the historic and archaeological significance of the site and to conserve and, where possible, enhance it through the preparation of development proposals which are informed by and respond to the archaeological and heritage constraints and opportunities highlighted early on by the completion of the baseline studies. This work will feed into the preparation and submission of the planning application, along with the evolution of the masterplan to minimise impacts where possible and maximise enhancements.

There has also been discussion with Cadw, Merthyr Tydfil County Borough Council and GGAT on the project integrating with the Councils' promotion of its local heritage and of delivering improvements in terms of management and access to the site's scheduled monuments.

Marvel have already worked with CADW to schedule six further historical monuments on the site, and its ambition is to enable people to experience and understand the historic importance of the land and its contribution to the greater Merthyr story. The appointed master planners have designed the scheme around many of the heritage assets on the site in order to protect, conserve and make them accessible. However, the condition of many structures continues to deteriorate as trees and other vegetation encroach. For example, the Cwm Pit chimney has suffered further, partial collapse and parts of the rail head wall are also at risk.

It is apparent that, given the present conditions at the site, the historic assets therein are subject to damage from invasive vegetation and ground instability. The proposal represents an opportunity to halt this decline and provide for the management of heritage assets both within and near the site in order to safeguard their significance. Further heritage information is provided in Appendix 6.

In addition, the site is subject to a number of statutory and non-statutory nature conservation designations that comprise the following:

- Cwm Glo a Glyndrys SSSI – the road access from the A470/A4102 roundabout directly affects the SSSI as do parts of the proposed Snow Centre;
- Rhydyar West SINC (SINC 36) – in the south.

The wider landholding within which the proposed application site sits has been subject to a number of ecological surveys since 1994, with more intensive attention since 2005. EIA studies were carried out for a previous landowner and applicant in 2005-2008, and in parallel a number of studies were carried out by the then CCW to inform consideration of the extent of the SSSI designation (which, as a consequence of that work, was expanded from a 29.1ha area outside the currently proposed application site to a much larger 183.3ha which now includes part of it). Since 2015, Bioscan have been retained by the current landowner and have carried out detailed surveys, the results of which have informed an iterative process of selecting the most appropriate and least impacting locations for development within the wider landholding (further information provided at Appendix 4). The proposed development footprint is a result of that process.

As discussed in greater detail within the appendices, effort has been made in the design of the development proposals to minimise impact on both statutory and non-statutory designations wherever possible. This has been informed by extensive consultation and dialogue with NRW, GGAT, Cadw, the Coal Authority and landscape and ecology officers within MTCBC for a number of years.

Proposal

The development proposed comprises the following mix of uses which are described in greater detail below:

- Built leisure;
- Low density leisure;

Built leisure

The built leisure component would comprise 16.8ha of land to the west of the A470/A4102 roundabout. Specifically, the built leisure elements would comprise:

Table 1: Built Leisure

Built Leisure Development	Use Class	Site Area (ha)	Floorspace (m ²)	Max Height (m ²)
Indoor Snow Centre	D2	3.1	30,500	15m (General height along its length) / 32m (max height in relation to surrounding ground level)
Indoor Water Park	D2	0.8	5,100	15
Spa Hotel (c.250 beds)	C1	0.8	12,500	41
Sport Hotel (c.170 beds)	C1	0.3	11,850	33
Indoor Adventure Centre	D2	0.4	3,500	12
Outdoor Adventure Centre	D2	0.6	-	-
Associated roads, parking and landscaping etc	n/a	10.8	-	-
TOTAL	-	16.8	63,450	-

Indoor Snow Centre

- The UK's largest multi-slope and freestyle park, extensive and significant beginners' slopes and children's fun play area. The c.400 metre slopes will be the longest in the UK and will be modelled on successful European snowcentres (such as multi award winning SnowWorld at Landgraaf, The Netherlands which has been successfully operating for c.20 years) but will incorporate the latest technology and advancements, design and operating technologies as well as energy efficient operating solutions.
- FIS (International Ski Federation) approved international competition slope for Slalom Championships and fully aligned with Olympic requirements.
- Dynamic slope management creates the opportunity to welcome everybody from beginners and snowsport enthusiasts to international professional guests.
- The Design simulates an Alpine resort setting with comprehensive on snow free ski/board and leisure time, lessons, coaching, and great "Après-Ski" food and beverage attractions.
- In conjunction with GB Snowsport Head Coach and Director of Performance in collaboration with Snowsport Wales CEO and National Coach, the development will establish:
 - The UK National Centre of Excellence for Snowsport and the home of Team GB/the British Olympic Team
 - Welsh Centre of Excellence for Snowsport and the home for Snowsport Wales and the Welsh National and Olympic Team
- The Snowsport Centre of Excellence will deliver the following:
 - Put Wales and the UK on the International competition circuit
 - International elite sports teams visits for training
 - Significant accommodation demands
 - Facilitate tourism

Other Anchor & Key Leisure Attractions

- Water Park – An indoor waterpark would be provided adjacent to the above hotels/spa providing a modern, year-round water-based leisure facility. The attraction would accommodate flume rides, a lazy river, an indoor surf simulator and signature big thrill rides.

- Indoor Activity Centre – all of the family favourites with the emphasis on healthy family fun and activity plus the latest developing technology offerings.
- Outdoor Activity Centre – comprising activities such as ropes courses, adventure challenges and thrill rides.
- Outdoor Trails for walking and biking and discovering heritage and ecology.
- The combination of all activities is configured to create an “all year round” sustainable leisure resort facility in line with VISIT WALES “Priorities for the Visitor economy” National Tourism plan.

Accommodation

- Hotels – This would comprise one 4* 170 bed hotel and one 4* 250 bed hotel. The aim of these facilities would be to capture potential overnight stay expenditure visiting the proposed on-site leisure, visitors to the adjacent Bike Park Wales, as well as general visitors to the nearby/surrounding facilities/National Park. Merthyr Tydfil is currently not able to benefit extensively from this potentially important source of economic activity and accordingly the proposed development seeks to redress that.
- Spa – a spa/wellness centre will be provided in association with the above hotel offering.

Operationally, if we exclude the Indoor Snowcentre aspect of the Rhydyar West Development, the project can perhaps be best understood by reference to the hugely successful Centre Parcs offering. An all year-round high occupancy rate holiday environment centred around a very large indoor pool and numerous indoor activities for families to participate in as well as outdoor attractions for when the weather is fine.

A key aim of the Rhydyar West facilities would be to capture multiple overnight (longer) and repeat stays. Accommodation and length of stay is a key component of the overall leisure offering. Combined with the high focus successful destinations of Zip World and Bike Park Wales and the significant array of adventure opportunities and pursuits e.g. climbing, walking, kayaking, caving, paddle boarding, canyoning and much more. The South Wales Valleys region is elevating itself as a UK premier destination for adventure tourism. Add to this the natural and stunning Welsh landscape, The Brecon Beacons National Park and a rich and extensive heritage offering gives the foundation for constant and repeat staycations with Rhydyar West providing the weatherproofing insurance of indoor options for complete booking confidence in the “Shoulder Seasons” and welcoming visitors “All Year Round”. Reference will be made to the Welsh Government priorities for the visitor economy, in particular: seasonality spend spread (to grow off-peak tourism), encouraging visitors to spend longer and spend more in Wales, focusing on the quality of the tourism offer and making our products more visible and bookable.

Some indirect effects are expected to be increased visitor footfall for Merthyr Town Centre with visitors seeking holiday retail experiences especially for locally produced products and for local entrepreneurs to identify new business opportunities which in turn will generate local employment.

Vehicular access would be gained from the A470/A4102 roundabout with a new western arm being provided. Pedestrian and vehicular access would be integrated with other parts of the site to allow walk-in trade and scheme permeability.

Of the 16.8ha of built leisure development land, only the extended length of ski run, and a length of the initial access road off the A470 roundabout, along with associated engineering works, would directly impact the SSSI. The remainder of the area is allocated as SINC.

Mitigation

Mitigation and compensation for impacts on designated sites (mainly SINC land for the built leisure element of the development, but also including some SSSI land, SAMs and potential SAMs), and on protected species will comprise the following:

- Maximum avoidance of highest quality habitats through the process of detailed design and micro-siting to avoid/reduce impact on key SSSI or SINC interest features such as marshy grasslands, mire communities, highest quality waxcap grasslands and areas of known importance for species such as marsh fritillary. The focus of development will be on poorer quality tip grasslands (associated with A470 spoil) and on secondary woodlands developed over the last century or so on land formerly disturbed by mining and other industrial activity. This significantly reduces the potential ecological impacts arising.

- Mitigation for impacts rendered residual after such 'embedded' or 'design' mitigation is taken into account includes preventative measures in relation to protected species (including phased habitat manipulation to discourage terrestrial-phase great crested newts and reptiles from the development footprint), and seasonal restrictions on site clearance works to avoid the potential for impacts on nesting birds. Additional licensed mitigation activities for species such as bats and great crested newts may be required, and will be delivered by means of the requisite licenses. Taking account of compensatory habitat enhancement and/or creation (see below), the magnitude of impact is such that no impediment to achieving the necessary licenses is anticipated.
- Additional mitigation will be secured via a Construction Environmental Management Plan (or similar) to ensure tight control of site clearance and subsequent development activities to prevent encroachment into adjoining areas, minimize related damage and disturbance, and control issues such as the potential for surface water pollution. Such controls would also include prescriptive removal and control methods for the scheduled invasive plant Japanese knotweed which is present also within the leisure development footprint and for which the development provides a means for eradication.
- Additional compensation measures will be focused on delivery of habitat management within the undeveloped balance of the wider land ownership, including woodland management to improve structure and future value, and management of areas where absence of grazing (both historic and currently) is posing a threat to open habitats such as wetlands, mire communities and waxcap grasslands. Improved management of ponds to prevent their loss through succession will also provide a means to compensate for losses within the development areas.

Low density leisure

The low density leisure component would comprise 8.8ha of land to the south west of the A470/A4102 roundabout. Specifically, this would comprise forest lodge accommodation:

Table 2: Low density Leisure

Low Density Leisure Development	Use Class	Site Area (ha)	Floorspace (m ²)	Max Height (m ²)	Max Width (m ²)	Max Length (m ²)
Forest Lodges (up to 90)	<i>Sui generis</i>	Up to 8.8	Up to 6,000	Up to 6	Up to 10	Up to 10

- An area in the south of the site for low density log cabins. It is envisaged that the log cabins and such limited development as is necessary to provide appropriate amenities could be carefully sited to avoid adverse effects on natural and historic features of interest and would be designed to assimilate into their surroundings, integrated in a green space network;
- This area would be car free, with vehicles parking adjacent to the hotels and the rest of the site to the south being accessed by walking/cycling only (albeit with electric mobility vehicle access for those that require assistance);
- This part of the site generally would provide trails and paths for the public to use and interpretation of the wildlife and heritage assets and the site's history generally. Again, the fine-grained layout of such a facility could accommodate the natural and historic features of interest on the site, with opportunity for building upon the historic links with the surrounding area and connecting with routes through the town and the wider public rights of way network. This facility is envisaged as including mountain bike trails/cycle link/nature walks/equestrian routes (as part of a site-wide cycle/ bridle/ foot way network, linking into the networks of the surrounding area, in particular routes linked with the industrial-historic resources). It would be intended to link the cycle trails into Bike Park Wales to the south as well as to provide cycle connectivity and permeability by non-car modes.

Vehicular access would be gained from the A470/A4102 roundabout, as described above with vehicular access beyond the built leisure car park being prohibited. Users of the low-density leisure would leave their cars in the car park and access the facilities on foot, by bike or via buggies.

Mitigation

Mitigation and compensation for impacts on designated sites (mainly SINC land for this element of the development), and on protected species will comprise the following:

- Maximum avoidance of highest quality habitats through the process of detailed design and micro-siting (e.g. of lodges) to avoid any impact on SINC interest features such as marshy grasslands, mire communities, highest quality waxcap grasslands nor areas of known importance for species such as marsh fritillary. The focus of development will be within secondary woodlands developed over the last century or so on land formerly disturbed by mining and other industrial activity. This significantly reduces the potential impacts arising.
- Mitigation for impacts rendered residual after such 'embedded' or 'design' mitigation is taken into account includes preventative measures in relation to protected species (including phased habitat manipulation to discourage terrestrial-phase great crested newts from the development footprint), and seasonal restrictions on site clearance works to avoid the potential for impacts on nesting birds. Additional licensed mitigation activities for species such as great crested newts and bats may be required, and will be delivered by means of the requisite licenses. Taking account of compensatory habitat enhancement and/or creation (see below), the magnitude of impact is such that no impediment to achieving the necessary licenses is anticipated.
- Additional mitigation will be secured via a Construction Environmental Management Plan (or similar) to ensure tight control of site clearance and subsequent development activities to prevent encroachment into adjoining areas, minimize related damage and disturbance, and control issues such as the potential for surface water pollution. Such controls would also include prescriptive removal and control methods for the scheduled invasive plant Japanese knotweed which is present locally within the low-density leisure development footprint and for which the development provides a means for eradication.
- Additional compensation measures will be focused on delivery of habitat management within the undeveloped balance of the wider land ownership, including woodland management to improve structure and future value, and management of areas where absence of grazing (both historic and currently) is posing a threat to open habitats such as wetlands, mire communities and waxcap grasslands. Improved management of ponds to prevent their loss through succession will also provide a means to compensate for losses within the development areas.

EIA Regulations

Taking into consideration both the EIA Regulations 2017 the proposed development does not fall within Schedule 1 where an EIA would be mandatory. However, the proposed development does fall under Schedule 2 of the Regulations, as follows:

- (10)(b) Urban development projects, including an overall area exceeding 5ha;
- (12)(a) Ski run exceeding 1 ha;
- (12)(c) Holiday villages and hotel complexes outside urban areas, exceeding 0.5ha;
- (12)(e) Permanent camp site, exceeding 1ha.

Schedule 3 of the Regulations set out the 'selection criteria' which must be taken into account in determining whether a development falling within Schedule 2 is likely to have significant effects on the environment. The three broad criteria (including a number of detailed considerations in each criterion), are:

1. Characteristics of development;
2. Location of development; and
3. Types and characteristics of the potential impact.

The application site is located within a 'sensitive area' as defined in regulation 2(1) as it includes land notified under s28 of the Wildlife and Countryside Act 1981 (a SSSI) and includes scheduled monuments within the meaning of the Ancient Monuments and Archaeological Areas Act 1979.

Having regard to the proposed character, location and potential impact, we have concluded that the development will have likely significant environmental effects and in light of this, we consider that the proposed development represents 'EIA development'.

Scoping

Having concluded that the proposed development comprises EIA development, we are seeking an opinion as to the scope and level of detail of the information to be provided in the ES, under Regulation 14. A preliminary appraisal of potential impacts on the present environment have been summarised in the appendices which follows.

Conclusions

We trust the information provided is sufficient to allow you to process the above request and look forward to receiving notification of your scoping opinion at your earliest convenience. As noted above, it would be helpful if this could identify any developments we should take account in in respect of cumulative impact, including any planning reference numbers, as required. In the meantime, please do not hesitate to contact us should you have any queries. Please note that a scoping opinion should normally be adopted within eight weeks of receiving a request and accordingly, we look forward to hearing from you shortly.

Yours sincerely,



Peter Waldren
Director
For and on behalf of Tetra Tech

cc Ali Tyebkhan, Marvel Ltd

Encl.
Appendices 1-14
Location Plan (91-003)
Masterplan (SK0005)

Appendix 1: Community and Socio-Economic

A development of this nature and magnitude will have likely significant socio-economic effects, drawing people and potential expenditure from a wide area and adding a significant leisure offering to South Wales. The assessment will consider construction effects and operational effects, considering FTE employment levels and likely GVA including the following:

Economic Benefits – Quantitative

Presenting the direct and indirect benefits associated with the project including:

- Construction Employment
- Long Term Employment arising from the development and its operations.
- Employment Additionality
- Indirect and Induced Effects – further economic activity (jobs, expenditure or income) associated with additional local income, local supplier purchases and longer-term development effects
- GVA Impacts
- Visitor Expenditure
- Business Rates

Economic Benefits – Qualitative

Wider, non-monetised benefits including:

- Reputation for sporting excellence
- The ability for the area to become a destination, placemaking
- The ability to generate further investment in the area

Social Value

Benefits to the host community including:

- Local content – e.g. supply chain expenditure with local contractors
- Local employment
- Employment from disadvantaged groups
- Apprenticeships and Skills Development / Training Schemes

Appendix 2: Sustainability and Climate Change

This section provides the Climate Change scoping assessment and provides a summary of the potential effects and how this will be addressed in the EIA and presented in any subsequent ES chapter.

Baseline Conditions

The current and future baseline conditions will be based upon current global and local climatic conditions and predictions.

Further Assessment

The desk-based study for the climate change assessment will be undertaken in consultation with the design team and relevant technical consultants, including, flood risk and drainage, landscape, and sustainability (if required) and will consider the following:

- Effects on climate change:
 - Existing climate / greenhouse gases baseline;
 - Mitigation included in the scheme design to improve energy efficiency.
- Climate change resilience:
 - The historic climate baseline;
 - Future climate projections for the study area;
 - Mitigation included in the scheme design to improve its resilience to climatic changes.

There is at present no single accepted methodology for the assessment of climate change within an EIA. The proposed assessment methodology will therefore be based on professional judgement and existing sources of guidance, especially Climate Change Resilience and Adaptation Guidance (IEMA, 2015) as well as the Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation (June 2020).

Information to inform the climate resilience baseline will draw upon the Met Office historic climate baseline and UKCP18 data.

Mitigation within the Submitted Design

Mitigation measures to improve the efficiency of the development, and therefore reduce the GHG footprint of the development and improve its resilience to climate changes will be outlined in the ES chapter and where necessary in the Design and Access Statement and Planning Statement that will accompany the planning application.

Receptors to be Considered

Construction Phase

The earth's atmosphere / climate is the receptor for the assessment of the effects on climate and is categorised as being of Very High Sensitivity, given the potentially global effects of climate change and the UK's legally binding commitments to reduce GHG emissions.

Operational Phase

The earth's atmosphere / climate is the receptor for the assessment of the effects on climate and is categorised as being of Very High Sensitivity, given the potentially global effects of climate change and the UK's legally binding commitments to reduce GHG emissions.

Cumulative Phase

An assessment of the likely significant cumulative effects of other developments within the scheme area will be undertaken within the climate change assessment. A list of the proposed cumulative schemes will be consulted with the local authority and other statutory consultees and any identified effects will be assessed and mitigated, where practical.

Likely Environmental Effects of the Scheme

Construction Phase

The construction phase has the potential to increase greenhouse gas emissions due to emissions from construction works on site.

The construction phase also has the potential to be vulnerable to changes in climate, resulting in risk of delay in construction activities and potential effects on construction staff.

Operational Phase

Operationally, the effect on climate change is expressed directly through carbon emissions and consequently the energy consumed via activities such as usage of heating, ventilation, lighting and appliances to fulfil the needs of the site users. Residual effects, both adverse and beneficial, of the project post implementation of the identified mitigation will be confirmed and additional mitigation will be provided, where practical.

Once operational, the development has the potential to be vulnerable to changes in climate.

Cumulative Phase

Residual effects, both adverse and beneficial, of the project post implementation of the identified mitigation will be confirmed.

Summary

At this stage, the exact effects of the development on climate change and schemes resilience to climate change are not yet known. As a result, a climate change is scoped into the ES.

Appendix 3: Ground Conditions

This section considers the potential impacts of the proposed development on the ground conditions at the site following the completion of a desk top assessment, site walkover and preliminary risk screening based on development proposals. It provides details of our preliminary ground conditions assessment, describes the data collation process which will be followed to assess existing ground conditions during the Environmental Statement preparation and provides details of the proposed methodology which will be adopted to identify and assess potential impacts that may occur during the construction and operational phases of the development.

Baseline Information

The following source of information has been used to undertake an initial assessment of the existing ground conditions within the site boundary and to identify potential impacts:

- Draft Ground Conditions Desk Study, WYG, A091860, 2018, and the references therein.
- Coal Authority Mining Abandonment Plans
- Historic Site Investigation reports and assessments
- Geological Plans, Mapping and historic boreholes
- Aerial Photographs
- Plans showing the location of historic shafts and adits
- Plans showing the location of spoil tips
- 3 dimensional interactive ground model developed to review the extent and treatment of the abandoned mineworkings

No consultation or agreement has been undertaken with Merthyr Tydfil County Borough Council or its consultees with regard to ground conditions to date.

Geology

Reference to published British Geological Survey (BGS) Mapping for the site (Sheet 231) indicates that extensive deposits of made ground are present across the site in the form of large spoil heaps present across the majority of the wider site and within the eastern part of the proposed development area. The site is underlain by superficial deposits of glacial till overlying bedrock of the South Wales Middle and Lower Coal Measures, comprising mudstones, sandstones and siltstones, interspersed with ironstone veins, coal seams and seat earths. At least twelve coal seams outcrop at the site. The extensive mining of numerous coal seams and iron veins at the site and in the surrounding area has disrupted the natural geology as a result of the creation of mine entries in the form of shafts and adits, disused workings and the placement of spoil.

Hydrogeology

The Lower and Middle Coal Measures are categorised by Natural Resources Wales (NRW) as Secondary A Aquifers, defined as permeable layers capable of storing water supplies at a local rather than strategic scale, and in some cases form an important source of base flows to rivers. The Glacial Till deposits are categorised as unproductive strata by NRW.

Radon

A localised area of the site is likely to require basic radon protection measures for new buildings.

Previous Ground Investigations

Ground investigation has previously been undertaken to evaluate remaining coal reserves, and to assess the integrity of the numerous spoil tips that are present. The findings of these investigations confirm the geological succession as outlined above. No geotechnical or ground contamination investigation has been undertaken and base line information pertaining to geotechnical properties and ground contamination is currently unknown.

Site History

The site has been extensively mined for coal and ironstone since the late eighteenth century although small scale surface mines may predate the recorded activities. Intensive mining began in the 1760s when the site became the main mineral take for the Cyfartha Iron Works. Mining for Cyfartha is reported to have first occurred in the Cwm Pit in the south-eastern corner of the site, with coal being carried by boats along the Cyfartha Tub Boat Canal. The Canal became redundant with the rise of the railway and mineral railways across the site, becoming abandoned by the 1840s. Mining for iron stone diminished within the site by the late 19th century although coal mining continued until the mid-20th century. By this time, the site was largely derelict and abandoned with large areas of colliery spoil tips and more localised areas of made ground associated with former tramways, canal and collieries. Agricultural activities have occurred across parts of the site undisturbed by mining.

Landfills and Waste

Waste produced at the site is largely in the form of mining spoil, but it is possible that other incidental materials have been deposited within the spoil tips. No registered landfill sites or waste disposal facilities are recorded to have been present on the site.

Assessment Criteria

An initial qualitative risk assessment has been completed for the site to assess the potential impact of the proposed development on ground conditions beneath the site. The lack of targeted site-specific data has not allowed a quantitative assessment of potential risk to receptors at this stage but serves to provide baseline information to inform the EIA process.

An assessment of the potential impacts on the ground conditions from the proposed development will be undertaken in accordance with current legislation and guidance during the EIA stage. The impact assessment will be based on a risk assessment approach whereby the risk is established before and after the activity which is being assessed. The risk assessment is a combination of the probability of an event and the consequence of the event occurring.

Anticipated Impacts

Based on the information available, it is considered that the development would have the potential for beneficial and adverse impacts on the site, during both the construction and operational phases of the development. However, it is anticipated that mitigation measures could be employed to reduce the adverse impacts to acceptable levels (neutral or beneficial impacts).

Construction Effects

During the construction phase, the following potential impacts have been considered:

- Construction activity could result in increased instability of subsurface ground conditions and spoil tips;
- Mobilisation of elevated contaminants present in the natural soils or Made Ground deposits;
- Earthworks for the proposed development could result in loss or burial of topsoil;
- Uncovering and mobilisation of as-yet unidentified contamination, with corresponding potential impact on both human health and controlled waters/ wider environment receptors;
- Exposure of construction workers to contaminants within the areas of made ground;
- Mobilisation and accumulation of ground gas associated with the creation of migration pathways along drainage or service runs or piled foundations;
- Potential for spillages/leaks of fuels and chemicals to occur during the construction works from the use and refuelling of mobile plant and the storage of chemicals on the site, which may result in the contamination of soils and groundwater;
- Alteration of onsite hydrology /drainage leading to potential destabilisation of spoil tips;
- Import of material that is chemically and geotechnically unsuitable with the potential to impact human health, controlled waters/ wider environment receptors and building infrastructure;
- Mobilisation of contamination during removal/remediation of contaminated made ground.

Operational Effects

The proposed scheme incorporates a multi-use development consisting of built and unbuilt leisure accommodation. During the operational phase of the development, the following potential impacts (adverse and beneficial) to the ground conditions are anticipated:

- Potential for spillages/leaks of fuels, chemicals or sewage which may result in the contamination of soils or groundwater;
- Diffuse pollution from site maintenance works e.g. use of road salts and herbicides;
- Accumulation of landgas beneath the floor slab of new structures and subsequent migration into buildings with the potential to impact human health (future site users);
- Reduction in infiltration rates across the site due to the presence of increased low permeability hardstanding leading to reduced mobilization of ground contamination and resultant beneficial impact on receiving waterbodies;
- Beneficial improvement in ground stability as a result of stabilisation of mine workings and mine entries.

Potential Mitigation

Based on the desk top assessment, baseline information, including the ground conditions model referred to above, walkover surveys and preliminary risk screening process, it is apparent that ground conditions are complex and the site has been affected by its mining legacy. However, the development location has been chosen to minimise and avoid ground conditions risk wherever possible. A number of uncertainties and data gaps were identified during the preliminary risk screening which will require further investigation as detailed below.

Mitigation measures are likely to include but may not be limited to the following. The implementation of the proposed mitigation measures will provide beneficial impacts for the site due to improvement in ground stability and management of contaminated land, water and landgas issues.

1. Establishing the Baseline

The collection of baseline data associated with the site will enable development of the conceptual site model and will inform the requirement for further risk management measures. The baseline can be established by two approaches; desk based studies and site based work.

Desk and site based studies:

- Further assessment of Coal Authority records to identify mine entries, worked ironstone veins and coal seams and assessment of the amount of coal worked from historical records and borehole logs.
- Consultation with the Contaminated Land Officer and Engineering Department of Merthyr Tydfil County Borough Council, Natural Resources Wales and Coal Authority).

Site specific survey and intrusive ground investigations to provide data on the following aspects:

- Ground conditions and depth to competent strata and/ or bedrock;
- Nature and extent of made ground in terms of stockpiles and general made ground;
- Presence/absence of contamination, to enable an updated CIRIA 552 risk assessment;
- Presence of shallow mine workings and mine entries;
- Stability of spoil tips;
- Geotechnical properties of shallow soils and bedrock;
- Permeability of the ground encountered, hydrology and hydrogeology; and
- Presence/absence of land gas.

2. Geoenvironmental Risk Assessment including geotechnical and chemical assessment of ground conditions and hydrogeological/hydrological risk assessments.

Information contained within the baseline assessment will be used to undertake a geoenvironmental assessment of ground conditions to identify areas of the site where concentrations of contamination pose an unacceptable risk to potential receptors including site users, construction workers, ecology, archaeology, local groundwater and surface water bodies. Geotechnical assessment will be undertaken to determine suitable parameters for construction design, slope stability mitigation and ground improvement.

3. Mining Risk Assessment

An assessment of mining based activities in the context of the proposed development in order to identify potential remedial works required to stabilise former mine workings, mine entries and spoil tips etc.

4. Localised stabilisation of mine workings / spoil tips

Based on the information obtained as part of the baseline assessment and mining risk assessment, localised stabilisation treatment of mine workings, mine entries and spoil tips.

5. *Localised Remediation of Contamination/ Reactive Remediation Management Plan*

The localised remediation of contaminated soil and groundwater to reduce the risks to key receptors to an acceptable level. A Reactive Remediation Management Plan will be required to ensure the appropriate management of previously unidentified contamination during the construction phase.

6. *Materials Management Plan (MMP)*

A MMP setting out the measures required to control the movement, reuse, importation and disposal of soils during the development and operational phases. Where suitable, spoil can be reused to aid in the regrading of tips, or the levelling of ground. This would decrease the need for material to be imported to site and reduce vehicle movements. Topsoil will be segregated and re-used on site where possible.

7. *Construction Environmental Management Plan*

A construction environmental management plan setting out the measures required to avoid, minimise or mitigate effects on the environment during the construction phase.

8. *Piling Risk Assessment*

Pile foundation design taking into consideration of known ground conditions and will be based on current best practice guidance for piling in contaminated sites, with particular reference to prevention of the creation of migration pathways for potentially contaminated surface and ground water and mine gas;

9. *Landgas Risk Assessment*

Ground gas assessment will be undertaken compliant with CIRIA C665 guidance and protective measures adopted in the design of buildings and enclosed spaces as required.

10. *Operational Management Systems*

During the operational phase of the development Operational Management Systems will be required to ensure the correct management of fuels/oils/chemicals and waste materials.

Appendix 4: Ecology

Introduction

The wider landholding within which the proposed application site sits has been subject to a number of ecological surveys since 1994, with more intensive attention since 2005. EIA studies were carried out for a previous landowner and applicant in 2005-2008, and in parallel a number of studies were carried out by the then CCW to inform consideration of the extent of the SSSI designation (which, as a consequence of that work, was expanded from a 29.1ha area outside the currently proposed application site to a much larger 183.3ha which now includes part of it). Since 2015, Bioscan have been retained by the current landowner and have carried out detailed surveys, the results of which have informed an iterative process of selecting the most appropriate and least impacting locations for development within the wider landholding. The proposed development footprint is a result of that process.

The results of the cumulative surveys data provide an excellent understanding of the baseline ecological conditions on the site. The existing information base and the surveys that inform it are summarised below. New surveys to inform the EIA to accompany the current application are underway, and agreement is sought on their scope. Given the wealth of extant information, where appropriate it is intended to limit novel survey work to the level required to 'refresh' and verify extant and long-established findings – attention is drawn to this in the summary below.

Baseline conditions – data sources

In addition to reviewing survey information for the site dating back to 1994, Bioscan have undertaken a significant volume of more recent survey work on the site since 2015, including survey campaigns in 2015-2016, during 2018 and from August 2020 into 2021 and ongoing. This has included, in summary:

- Habitat verification/condition surveys (Phase 1, Phase 2, NVC, including ground truthing and updating results of Bosanquet and Stevens work for CCW and mapping Priority habitats) (2015, 2018)
- Targeted botanical work (e.g. searches for nationally scarce plants) (2015 and 2016)
- Mycological surveys (focused on 'CHG'¹ fungi) (2015, some work in 2018 and full re-survey in 2020)
- General invertebrate surveys (including standing water aquatics, and overnight moth trapping) (2015, 2018)
- Butterfly surveys (including marsh fritillary larval web surveys) (2015, 2020)
- Great crested newt surveys (spring 2015, 2018)
- Bat surveys (including transect and static surveys of bat activity, swarming surveys and detailed examination of built structures for winter and summer roosts) (2015, 2016, 2018)
- Breeding bird surveys (2015 and 2018)
- Wintering bird surveys (2015/16, refresher 2021)
- Dormouse surveys (2015)
- Badger surveys (2015 and 2016)
- Desk survey and data trawl (including review of on-line data repositories, work by previous consultants and file information held by NRW)

¹ Clavariaceae, Hygrocybe spp and Geoglossaceae.

The work accords with a survey programme scoped with both NRW and Rolf Brown (Merthyr Borough Council) in e-mail correspondence dated June 2015, with some additional work on bats and GCN, following further scoping meetings and correspondence with NRW in 2016 and 2017.

Baseline conditions - designations

The 22.83ha proposed for mixed leisure development encompasses relatively small areas of the Cwm Glo a Glyndrys SSSI, and a rather larger proportion of the Rhydycar West SINC.

Cwm Glo a Glyndrys SSSI

The basis for the Cwm Glo a Glyndrys SSSI designation is the presence of extensive areas of unimproved marshy, neutral and acid grassland, the intimate association of these habitats as a matrix with others (including woodland and heath) and the “outstandingly diverse” assemblage of grassland fungi, for which it is cited as one of the best sites in Britain, and one of the best sites for waxcaps (*Hygrocybe* spp) in western Europe. Land take from the SSSI cannot be avoided entirely due to the need to construct an access into the development from the A470 (which will affect a very small part of the designated area) and the need to extend the snow centre building into the SSSI to make best use of the existing topography. Despite these incursions, in the main, the most important areas of the cited habitats and interest features have been avoided by careful siting. This includes areas that have been identified in the surveys referenced above as hotspots for waxcap fungi interest and areas of high marsh fritillary abundance.

Rhydycar West SINC

The Rhydycar West SINC (SINC36): straddles the southern boundary of the landholding, and most of the proposed development will be sited within it. The designated area is stated to qualify under a range of applicable SINC criteria on the basis of the mosaic of unimproved and species-rich grassland, heath and other open habitats, extensive wet woodlands, areas of upland oak woodland, ‘ffridd’ complexes, the presence of great crested newts, badgers and noctule and pipistrelle bats, the possibility of water vole and marsh fritillary, a range of nationally scarce invertebrates, UK BAP Priority bird species (equivalent to ‘Welsh Priority’ species as referred to elsewhere in this document), the butterflies dark-green fritillary and small pearl-bordered fritillary and a range of uncommon or scarce vascular plants. The main SINC-designated habitats affected by the proposals are wet woodlands with smaller areas of species-rich grassland, ‘ffridd’ (supporting species such as small pearl-bordered fritillary and some ‘Welsh Priority’ bird species) and habitats used by bats and great crested newts.

Baseline conditions – protected and notable species

European Protected Species

Active and static surveys of bat activity in 2015, 2016 and 2018 have recorded a diverse range of bat species on the landholding with summer, autumn and winter roosts confirmed (or strongly suspected on the balance of evidence) in a number of built structures associated with the site’s industrial heritage. This includes structures within the proposed application site. Species found roosting to date have included lesser horseshoe and brown long-eared bat, with whiskered and possibly other *Myotis* species suspected to roost in the Vale of Neath Railway Tunnel. Additional roosts are likely to be present in the mature tree resource. In addition to the above species confirmed as roosting, the following additional bat species have been recorded during activity surveys: greater horseshoe (Welsh Priority), barbastelle (Welsh Priority), Daubenton’s, Whiskered/Alcathoe/Brandt’s, noctule, serotine, common, soprano and Nathusius’ pipistrelle. The site, together with the wider landholding therefore supports a varied bat assemblage.

Great crested newts have long been known from the site and the overall status of this species remains little changed from the 2008 ES position albeit with some localised gains and losses. In the 2008 ES surveys, eleven/twelve ponds returned positive results for great crested newts – these being mainly clustered in the north-west of the landholding (outside the proposed application site) with one or two outlying populations in the south-east (including within the currently proposed application site). In 2015, nine ponds returned positive for great crested newts with overall distribution largely the same. After consultation with NRW, some additional eDNA work was carried out in 2017 on a total of 14 waterbodies within and adjacent to the wider landholding. This identified four 'positive' waterbodies. These four waterbodies and those waterbodies where great crested newts had been recorded in 2017 (numbering four) were then subject to six standard survey visits (using bottle traps, torching and egg searches) to understand the population size present. These survey visits were carried out over the newt survey season (between April and the end of May). During the surveys a maximum count of three great crested newts were found in one waterbody, with maxima of two, one and none from the other waterbodies. Other species recorded from the waterbodies include palmate and smooth newts, common toads and common frogs. The great crested newt population on the site appears sparse, albeit widely dispersed. The main focus of great crested newt populations remains land to the north and west of the proposed application site.

A nest tube survey for dormice in 2015 found no evidence of the species, either on the proposed application site or anywhere else within the landholding. Similarly, no evidence of otter has been found to date on the minor watercourses that cross the site, although transient use is possible as the species is present on the nearby Taff.

Other protected and notable species

Adder, grass snake and common lizard have been noted within the landholding, including in quite good numbers in the more open grasslands in the south-west of the site (including and in parts of the proposed application site). They are likely to be present wherever suitable habitat structure persists. Survey records to date have been on an ad hoc basis as agreed in scoping with Merthyr BC in 2015. No evidence of water vole has been found to date. Badgers are resident on the site, although only one significant sett has been found to date. This lies on the south-western edge of the proposed application site.

In terms of birds, nightjar is present (up to three territories, including within or overlapping the proposed application site). Willow tit, redstart, cuckoo, wood warbler and tree pipit were all noted to hold breeding territories within the proposed application site in 2015, 2016 or 2018. A good assemblage of breeding species generally includes (in addition to the above) lesser redpoll, stonechat, tawny owl, raven and high densities of willow warbler, bullfinch and other more common species. Species confirmed to date only on a transient basis, but which may breed nearby, include crossbill, kingfisher and dipper.

Surveys in 2015 recorded a notable assemblage of wetland beetles (including two nationally rare and eleven nationally scarce species from this taxonomic group alone), confirmation of the presence of the moths white barred clearing (first record for Glamorgan since 1910) and scabious longhorn (first record for Glamorgan since 1920), several other nationally scarce species, and the 'Welsh Priority' (Section 42 NERC Act) butterflies small pearl-bordered fritillary and dingy skipper. Brown-banded carder bee (also a 'Welsh Priority' species) is also present. All of these species were found within or close to the proposed application site during the course of 2015.

Other species of note that have been recorded within or close to the proposed application site include polecat and a number of locally uncommon or rare species, including soft-leaved sedge, meadow thistle, petty whin

and intermediate lady's mantle. The location where the nationally rare liverwort *Scapania paludicola* was recorded in fen-meadow habitat in 1994 is well removed from the proposed application site.

Proposed survey programme to inform EIA

Taking account of the wealth of extant ecological information for the proposed application site, in particular that collected since 2015, the following programme of surveys is underway:

- Great crested newts: All ponds within and within 250m of the proposed application site will be subject to eDNA survey. It is proposed that in combination with the extant survey information on this species, this will be sufficient to establish occupied/unoccupied ponds and that population information can be drawn from the extant information base for EIA purposes. **Confirmation on the acceptability of this approach for EIA purposes is sought from Merthyr BC and NRW.** In the alternative, full population assessment surveys (three techniques applied over six visits in accordance with standard methodology) will be undertaken of all ponds that return a positive eDNA result.
- Bats: the most recent dataset for this species group is from 2018, and comprises surveys carried out in accordance with the industry standard guidance in Collins 2016. As a consequence of this and previous surveys by Bioscan since 2015, the site's exceptional bat assemblage is now well established. On this basis, **confirmation is sought from Merthyr BC and NRW that the extant database is sufficient for informing assessments of the impact of loss or change of foraging habitat.** In terms of roosting, additional surveys of structures for roosting sites are proposed in 2021. Detailed roost inspection surveys of trees within the proposed application site are not proposed for reasons of practicality and proportionality. **Confirmation on the acceptability of this approach for EIA purposes is sought from Merthyr BC and NRW**
- Dormouse: The negative result for this species obtained from survey according to standard methodologies (Bright *et al* 2006) in 2015 is felt to be robust and no additional surveys for this species are programmed for the EIA. **Confirmation on the acceptability of this approach for EIA purposes is sought from Merthyr BC and NRW.**
- Reptiles: As agreed in scoping in 2015, the approach taken to this species group will be *ad hoc* recording as an adjunct to other surveys in the appropriate season. **Confirmation on the acceptability of this approach for EIA purposes is sought from Merthyr BC and NRW.**
- Birds: to refresh the extant dataset on wintering birds, survey visits have been undertaken in February and March 2021 and breeding birds surveys according to continuous transect technique (CBC methodology, per Bibby *et al* 2000) are programmed for the proposed application site and a 50m buffer around it for April, May and June 2021. This will bring the information base for this species group up to date.
- Habitats, botany and terrestrial mammals. The previous Phase 1 and Phase 2 work on habitats and botany will be revisited via surveys in May-June 2021 with any changes to habitat distribution and condition within and adjoining the proposed application site noted and mapped. Surveys for badgers, and surveys of any watercourses for field sign evidence of water vole or otter will be undertaken at the same time.
- Invertebrate surveys: repeat surveys for scarce and notable invertebrates will be undertaken between April and June 2021, refreshing and building upon the work undertaken in 2015 and 2018.

Update surveys of the site for grassland fungi and marsh fritillary larval webs were completed in autumn 2020.

The above survey programme is ongoing and will continue to be pursued unless variations are requested by Merthyr, having taken advice from relevant consultees such as NRW. Once the baseline information is assembled, EIA process will be completed using standard industry approaches as set out in CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1 (September 2019 revision).

Appendix 5: Transportation and Movement

Introduction

The methodology will be derived from the principles of the Town and Country Planning Environmental Impact Assessment Wales Regulations document, which sets out the overarching planning framework on the process and requirements for Environmental Impact Assessments. This document also references subsidiary documents that should be considered by any Transport and Movement Assessment.

The Transport and Movement Assessment will consider the environmental impact of the development site to the local area, in regards to traffic and transport. It will set out the short, medium and long term significance of effects to the study area for the site's construction period and operation. If mitigation is directly provided through the development of the site, the significance of effect will also be detailed for this scenario. In addition to the above, the Transport and Movement Assessment will be supported through the preparation of a Transport Assessment and Travel Plan, which will be submitted within the final document.

The Transport Assessment will audit the existing transport conditions and will set out the anticipated level of trip generation for all modes, advising on the residual impact of development vehicle traffic on the local highway network. Given the exceptional circumstances generated by COVID 19 and Government restrictions on travel behaviour, assessments will utilise historical data. The reason being that pre-COVID 19 traffic datasets will be more representative of the road network at site operation, when restrictions are likely to be lifted. Tetra Tech advise that preliminary studies have shown that the site can connect into the existing transport network, with the A470 benefitting from spare capacity to accommodate development site traffic. This detailed modelling of the network will be submitted to Merthyr Tydfil County Borough Council and Transport for Wales for their consideration via the application process.

The Travel Plan will outline measures and objectives, designed to encourage future site users to use sustainable travel modes instead of private car when making journeys to and from the site.

The Transport Assessment and Travel Plan will be scoped with Merthyr Tydfil County Borough Council and Transport for Wales, to make sure that appropriate planning material is provided for Officer review at submission.

Assessment Scenarios

Assessment scenarios will comprise:

- The Construction Phase;
- The Operation Phase; and
- The Operation plus Mitigation Phase.

The extent of highway mitigation to be provided by the application will be confirmed through the preparation of the Transport Assessment.

Study Area

The study area will be confirmed through reviewing baseline Annual Average Daily Traffic flows (AADT) for the adjacent road network and by assigning site construction and development traffic to road network. This will be achieved through a demand input matrix.

A Net Impact Assessment will be undertaken to determine the residual impact and growth in traffic along the adjacent network following the addition of AADT construction and development traffic vehicles. Carriageways

within the network that are subject to a 30% uplift, or 10% in areas classified as sensitive, in AADT flows will form the study area, with these carriageways classified as assessment receptors.

Receptor Sensitivity

The sensitivity of identified receptors will be assessed using best practice and policy guidance. The resultant thresholds that will be used to determine receptor sensitivity are summarised at Table 3.

Table 3: Sensitivity of Receptor*

Category	Significance Criteria / Sensitivity of Receptor
Major	Where the Development could be expected to lend to an increase of over 90% change in traffic
Moderate	Where the Development could be expected to lend to an increase of 60-89% change in traffic
Minor	Where the Development could be expected to lend to an increase of over 30-59% or 10-59% in sensitive areas in traffic
Negligible	Where no discernible effect is expected, the change in traffic is less than 30%, or less than 10% in sensitive areas, as a result of the Development at full operation

*Thresholds based on the guidance provided by Guidelines for the Environmental Assessment of Road Traffic (IEMA, 1993)

Magnitude of Change

Assessments will determine the magnitude of change for the following criteria:

- Effects on Traffic Flows;
- Severance;
- Driver Delay;
- Pedestrian Delay;
- Pedestrian Amenity;
- Fear and Intimidation; and
- Accidents and Safety.

The methodology for determine the magnitude of change is as follows:

Effects on Traffic Flows

A Net Impact Assessment will be undertaken, using the thresholds set out at Table TM1. This will determine the receptor's magnitude of change for AADT traffic flows.

Severance

Highways EIA guidance states that severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery.

EIA guidance suggests thresholds to determent road network severance, which are reproduced at Table 4.

Table 4: Severance Thresholds*

Severance Level	Traffic Flow (AADT)
Major	>16,000
Moderate	8,000 – 16,000
Minor / Negligible	<8,000

*Thresholds based on guidance contained in Volume 11, Section 3, Part 8, Chapter 6 of the Design Manual for Roads and Bridges (DMRB)

The thresholds set out at Table 4 will be used to determine the magnitude of change for severance.

Driver Delay

Driver Delay is when traffic on the network surrounding the Development is already at, or close to, the capacity of the system. Driver delay will be subject to the net impact generated by the development when compared to the baseline.

The guidance suggests that assessors use their judgement and modelling forecast software to determine whether driver delay is a significant effect.

Driver delay will be determined by industry standard modelling software, such as JUNCTIONS 9 and LinSig. This is appropriate as driver delay forms part of the assessment undertaken within these industry standard modelling packages.

Pedestrian Delay

Pedestrian delay refers to the change in volume, composition or speed of traffic that may affect the ability of change to people to cross roads.

The guidance suggests that assessors use their judgement to determine whether pedestrian delay is a significant effect. As such, the magnitude of change for pedestrian delay will be ascribed qualitatively, using professional judgement following a review of network infrastructure and pedestrian movements.

Pedestrian Amenity

Pedestrian amenity is broadly defined as the relative pleasantness of a journey. It is affected by traffic flow, traffic composition and pavement width / separation from traffic.

The guidance suggests that assessors use their judgement to determine whether change to pedestrian amenity is a significant effect. As such, the magnitude of change for pedestrian amenity will be ascribed qualitatively, using professional judgement and following a review of network infrastructure.

Fear and Intimidation

Fear and intimidation is dependent upon the volume of traffic, its HGV composition, its proximity to people and the lack of protection caused by such factors as narrow pavement widths.

The guidance states that there are no commonly agreed thresholds for estimating this from known traffic and physical conditions, but it does suggest some thresholds which could be used, which is based on previous research. These thresholds will be used by the assessor and are reproduced at Table 5.

Table 5: Fear and Intimidation Thresholds*

Magnitude of Change	Average Hourly Traffic Flow over 18hr Day (vehicles per hour)	18hr HGV Flow (vehicles per hour)
Major	1,800+	3,000+
Moderate	1,200 – 1,799	2,000 – 2,999
Minor	600 – 1,199	1,000 – 1,999
Negligible	599 or less	999 or less

*Thresholds based on the suggestions provided by Guidelines for the Environmental Assessment of Road Traffic (IEMA, 1993)

The thresholds set out at Table 5 will be used to determine the magnitude for fear and intimidation.

Accidents and Safety

The guidance suggests that professional judgement is used to assess the implications of local circumstances or factors which may elevate or lessen risks of accidents. Road safety information will be obtained from the Transport Assessment, which will provide a highway safety review, classifying road accidents by severity, location and frequency for a five year period.

This information, alongside a review of network infrastructure will be sufficient for the assessor to advise on the forecast magnitude of change that the site may have on accident and safety.

Significance of Effect

The sensitivity of the receptor and the magnitude of change will be interrogated, to determine the environmental significance of effect generated by the site. This will be undertaken by using the matrix set out at Table 6.

Table 6: Significance of Effect Matrix

		Receptor Sensitivity			
Magnitude of Change		Major	Moderate	Minor	Negligible
	Major	Major Adverse	Major Adverse	Moderate Adverse	Minor Adverse
	Moderate	Moderate Adverse	Moderate Adverse	Minor Adverse	Negligible
	Minor	Moderate Adverse	Minor Adverse	Minor Adverse	Negligible
	Negligible	Minor Adverse	Negligible	Negligible	Negligible

Assessment Results

The significance of effect will be categorised, forecasting the environmental highway impact for the network at construction, site operation and following implementation of mitigation measures, (if required). This will section will also detail the impact of effect, in regards to its longevity and whether it is short, medium or long term.

Appendix 6: Heritage

The site's mining history is closely associated with the Cyfartha Iron Works in Merthyr Tydfil and is situated within a wide landholding that was the source of the work's coal and iron stone and, at one time was one of the most intensively mined locations in the world. Some key historic assets are present within and adjacent to the site. These include the following:

Scheduled Monument - Cyfarthfa Balance Pond and Leat (GM608). An earthwork feature immediately adjacent to the site to the west comprising the partially buried remains of a leat and, further south a pond, that was a key element in providing water for former 19th century mines in its vicinity.

Scheduled Monument - Cwm Pit and Head of Railway (GM607). The remains of the Cwm Pit coal mine and its associated railway terminus located immediately adjacent to the site to the south-west. The monument includes stone revetment walls, a mine entrance, building remains and earthworks and contains a Grade II listed chimney base.

Scheduled Monument - Vale of Neath Railway Cutting and Tunnel Portal (GM606). The railway cutting and tunnel entrance are located just south of the remains at Cwm Pit and thus also close to the edge of the site. The tunnel was designed by Brunel and at the time was the longest railway tunnel in Wales. Its entrance is constructed in stone.

Scheduled Monument - Black Pins Early Ironstone Workings (GM609). This monument comprises earthworks, pits and large spoil tips related to early ironstone works and is situated on high slopes to the west of the site.

The site is crossed by the route of the former Cyfartha Canal and its successor, the Cwm Pit Railway. Both represented key historic transport routes between mines (such as those at Cwm Pit and others) and the iron works to the north. Whilst neither transport route is especially well-preserved within the site, better preserved parts are located further to the north, including a part of the canal that is a Scheduled Monument.

Some of the surface pits and adits within the site probably represent early mine workings. The site is crossed by a track, known as the Parish Road, an old route that pre-dates the more intensive industry. As an early transport route, it is likely that some of the mine working in the vicinity of the track could represent early works from the post-medieval period pre-dating the establishment of Cyfartha in the late 18th century.

Later focuses of mine working are also in the site that are less well-preserved as some of the Scheduled Monuments. These include a former mine at Glyn-Dyrus in an area which is now heavily waterlogged, and, at the northern edge of the site is an intensively mined area at Lower Collier's Row. Remains related to these works could still possess some limited archaeological interest.

Further to the north, beyond the areas proposed for development are additional historic assets related to industry and to the pre-industrial landscape. These include a further four scheduled monuments inclusive of sections of the Cyfarthfa Canal (as noted above), a former mining area at Cwm Glo, an air shaft and fan mechanism at Cwm Du and, from the pre-industrial era, the remains of a 17th century chapel that was related to the early non-conformist Christian movement. Also to the north are a row of preserved miner's cottages at Upper Colliers Row that are all Grade II listed buildings. As well as the designated assets listed above the land to the north and west of the site contains complex remains related to mining such as pits, levels, spoil tips, buildings and former tramroads from the 18th to the 20th centuries, which overlay a landscape of isolated post-medieval farms and fields with many of the farms still present as ruined buildings.

The Blaen-Canaid Valley lies to the south adjacent to Gethin Wood. The southern part of the site also previously formed part of the Cwm Pit colliery and contains a Grade II listed base of former industrial chimney associated with the historic use.

The site as a whole is included in the Merthyr Tydfil Landscape of Outstanding Historic Interest, which has been identified for its range and diversity of industrial archaeological sites, monuments and features

documenting the rich legacy of mineral exploitation and manufacturing. A number of these structures, features and deposits are recognised for their archaeological and historic value through designation as scheduled monuments and candidate scheduled monuments and listed structures. Indeed, the scheduling of these was carried out as part of the dialogue our client has had with Cadw and with full agreement on all sides. However, the continued dereliction of these structures and their deterioration through scrub and tree growth, ground instability (itself a legacy of past mineral exploitation), and human action is actively detracting from their heritage significance and contribution to the surrounding Landscape of Outstanding Historic Interest.

The site has been subject to a prolonged period of investigation and consultation by Marvel's archaeological and heritage consultants, who have built upon and expanded the extensive evidence base gathered for previous development proposals brought forward in the past, liaising with Cadw and the Council's archaeological advisors at Glamorgan-Gwent Archaeological Trust (GGAT) to evolve our understanding of the site and bring forward the designation of six new scheduled monuments also.

This prolonged process of investigation and consultation with key stakeholders has demonstrated that the site possesses and exhibits a broad diversity of archaeological sites spanning the post-medieval to modern periods and reflecting the wealth and depth of the historic environment of Merthyr Tydfil as one of the foremost towns in Wales for religious non-conformity and a key driver in the industrial revolution, where the identification and exploitation of the area's rich mineral deposits saw the town rise to world-wide recognition for the manufacture and distribution of high quality iron products.

Reflecting the town and district as a whole, the site possesses interleaved layers of archaeological and historic significance derived from and indeed illustrating the key phases in their development, with the wider historic landscape around the site retaining significant areas of post-medieval agricultural enclosures on the more elevated central areas, even though the eastern fringes still graphically illustrate an intensity and diversity of industrial exploration and exploitation linked to key national figures such as William Crawshay of Cyfarthfa Castle and where the remodelling they sponsored drove profound change to the pre-existing landforms.

Ever mindful of this background and the wider context, Marvel have sought from the outset to recognise and cherish the historic and archaeological significance of the site and to conserve and, where possible, enhance it through the preparation of development proposals which are informed by and respond to the archaeological and heritage constraints and opportunities highlighted early on by the completion of the baseline studies. This work will then feed into the preparation and submission of the planning application, along with the evolution of the masterplan to minimise impacts where possible and maximise enhancements.

Set within this context, it is recognised that the proposed development of the site has the potential to affect a range of 'historic assets', either in terms of direct, physical changes (i.e. through construction groundworks) or indirectly through changes in the way they are experienced in the landscape; i.e. their 'setting'.

Consultation was carried out with Cadw in 2017/2018, following which six additional Scheduled Monuments were designated within the site's wider locality and the national importance of the site's industrial heritage was underscored. As far as these scheduled monuments are concerned, from the outset discussions with Cadw have confirmed that there is a balance to be struck between the likely impact that arises through changes within at least some of their settings and the direct, physical benefits which development can bring in terms of improved management, public access/engagement and interpretation.

As such, the project aims to deliver an improved management and presentation regime for those scheduled monuments in the site's vicinity and increase public access to and enjoyment of the monuments and other

elements of the historic environment through the provision (in collaboration with Merthyr Tydfil CBC) of new Rights of Way across the site and its surroundings.

As well as delivering benefits to historic assets in the site's vicinity through conservation and interpretation, the project will tie into wider heritage regeneration in the region such as the Council-led project *The Cyfartha Plan* which aims, amongst other ambitions, to create a world class visitor destination at Cyfarthfa Park, Castle and Iron Works. With the archaeology of the site and its hinterland closely associated with the history of Cyfartha, there is a clear opportunity for collaboration with this local project regarding interpretation.

Wider still, the project provides an opportunity to, through the enhancement of access to and interpretation of historic assets in the site's vicinity, tie into the objectives for furthering the interpretation of Wales's industrial heritage defined by Cadw in the Pan-Wales heritage interpretation plan and specifically the document *Wales – the first industrial nation* (Touchstone, 2011).

So, it is clear that the proposed development has the potential to cause 'impacts' to the historic environment within the boundary and within its wider surroundings, but it also has the potential to bring forward significance 'enhancement' and so therefore a balanced judgement will be required when the planning application is submitted for evaluation and determination.

With regard to the current baseline position, the potential 'direct' effects of the proposed development can be summarised as follows:

1. Direct, physical changes to the 'national importance' of the scheduled monuments situated within the site's vicinity inclusive of any beneficial changes from enhancement management regimes;
2. Direct, physical changes to the special interest of the 'Base of Chimney at Cwm Pit', which is designated as a Grade II listed building;
3. Direct, physical changes to the Merthyr Tydfil Landscape of Outstanding Historic Interest resulting from land-take within the registered boundary;
4. Loss of, or damage to, previously identified/recorded archaeological sites, features, deposits and/or remains resulting from construction activities; and
5. Loss of, or damage to, hitherto unidentified/unknown archaeological sites, features, deposits and/or remains resulting from construction activities.

With regard to the current baseline position, the potential 'indirect' effects of the proposed development can be summarised as follows:

1. Change within the setting of the scheduled monuments situated within the site's vicinity, such that their national importance may be reduced or enhanced;
2. Change within the setting of the 'Base of Chimney at Cwm Pit' Grade II listed building, such that its significance may be reduced or enhanced;
3. Changes to the integrity of the Merthyr Tydfil Landscape of Outstanding Historic Interest more widely as a result of development within the site;
4. Change within the setting of scheduled monuments outside the site, but within the development's wider zone of influence; such that their significance may be reduced;
5. Change within the setting of listed buildings outside the site, but within the development's wider zone of influence; such that their significance may be reduced; and
6. Change within the setting of conservation areas outside the site, but within the development's wider zone of influence; such that their significance may be reduced.

In line with early consultation and discussion with representatives from Cadw and the Glamorgan-Gwent Archaeological Trust (GGAT) the site has been subjected to the preparation of an Archaeology and Heritage Baseline report to inform the development proposals and support the submission and then determination of the planning application later on.

The investigation and identification of the baseline position has been completed through the application of current best practice professional guidance:

- Chartered Institute for Archaeologists (CIfA 2020) *Standard and Guidance for Historic Environment Desk based Assessment*;
- Cadw (2011) *Conservation Principles for the Sustainable Management of the Historic Environment in Wales*
- Cadw (2017) *Heritage Impact Assessment in Wales*
- Cadw (2017) *Setting of Historic Assets in Wales*; and
- Countryside Council for Wales, Cadw & Welsh Assembly Government (2007) *Guide to Good Practice on Using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Process*.

The appropriateness of this approach to the identification of the archaeology and heritage baseline position was confirmed in advance by the preparation, submission and agreement with GGAT of a Written Scheme of Investigation (WSI) in 2017.

In addition, recourse has been had to the Register of Landscapes of Historic Interest in Wales because of the direct impact the proposed development would have upon the Merthyr Tydfil Landscape of Outstanding Historic Interest. Therefore, following consultation on the precise scope with Cadw, an assessment of the significance of the impact of development on historic landscape areas in the Register (ASIDHOL2) will be undertaken to inform evaluation and determination of the proposed development. This assessment process is set out in the Cadw guidance, *A Guide to Good Practice on Using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Process revised (2nd) edition (2007)*.

As far as the identification of potentially significant effects of development is concerned, it is expected that the potential for any direct impact to the scheduled monuments and one listed building will be minimised through careful masterplanning and appropriately sensitive design and conservation measures that respond to the conservation management needs of the assets.

Set within that specific context, the Archaeology and Heritage chapter in the Environmental Statement will consider the 'future baseline scenario', whereby development does not proceed and the condition of the historic environment within the site continues to deteriorate.

Direct impacts on archaeological sites, features, deposits and/or remains within the site can either be avoided through careful siting of development or mitigated through the completion of further investigation and recording undertaken ahead of or alongside construction, with the results of that process to be disseminated publicly and the archive to be deposited in the local collecting museum. The scope and methodology of archaeological evaluation and mitigation will be agreed in advance through consultation with the Glamorgan Gwent Archaeological Trust (GGAT).

Accordingly, the package of mitigation and compensation measures, which could be brought forward and implemented to avoid, minimise or otherwise offset the proposed development's likely impact on designated and non-designated historic assets (whether directly or indirectly), could serve to benefit the historic environment in terms of the long term conservation of the assets themselves, improved public access to and

enjoyment of those assets and the investigation and recording of non-designated archaeological remains to enhance understanding of the site's archaeological interest and its contribution to the growth of Merthyr Tydfil as a centre of religious non-conformity and an industrial powerhouse.

Appendix 7: Hydrology and Hydrogeology

Baseline Information

The baseline data pertaining to the hydrological and hydrogeological environment at the site has been obtained from the following report which serves to identify potential risks on a preliminary, qualitative, basis in addition to providing a baseline level of information to identify potential impacts of the proposed development:

- Rhydycar West – Desktop Hydrological & Hydrogeological Assessment, WYG. A091860. January 2018.

The above report will be updated to reflect revisions to the master plan. An updated copy of the Desktop Hydrological & Hydrogeological Assessment will be provided to the relevant consultees in due course.

Geology

A review of BGS Geological Mapping for the site (Sheet 231) indicate that extensive deposits of Made Ground are present across the site. The proposed development is shown to be entirely underlain by Glacial Till, Devensian – Diamicton Deposits.

The site is situated in the northern outcrop of the South Wales Coalfield. The underlying solid geology shown to be present beneath the site is the Middle and Lower Coal Measures Formations of the South Wales Coal Group.

Hydrogeology

The solid geology beneath the site comprises the Lower and Middle Coal Measures of the Coal Measures Group which are categorised by Natural Resources Wales (NRW) as Secondary A Aquifers, defined as permeable layers capable of storing water supplies at a local rather than strategic scale, and in some cases form an important source of base flows to rivers. The Glacial Till deposits are categorised as unproductive strata by NRW.

The Coal Measures Group generally comprises low permeability hydrogeological units composed of interbedded carbonaceous mudstones and sandstones with subordinate siltstones and coal seams. The Coal Measures therefore constitutes a complex multi-layered aquifer system rather than one continuous groundwater body.

The mining of numerous coal seams and iron veins at the site and in the surrounding area have largely disrupted the natural hydrogeological conditions in the Coal Measures by the creation of open shafts and disused workings. Many mine drainage adits continue to drain the coal seam and ironstone veins long after the cessation abandonment of mines and the rebound of groundwater levels. These mine features have created hydraulic continuity between layers which were previously isolated and, in some cases, between aquifer horizons and flooded disused workings.

The site not shown to be situated within an EA/NRW defined groundwater SPZ. No licensed NRW groundwater abstraction boreholes exist at the site or within 250m of the site boundary. Two private water supplies are located within 500m of the site at Blaencanaid Farm and at Bike Park Wales (both off site). Base line information pertaining to the groundwater quality beneath the site is currently unknown.

Hydrology

There are several streams which are shown to be crossing the site area, generally flowing in an east to west orientation towards the River Taff which is located approximately 600m to the west of the A470 Trunk Road. Several large ponds and emerging springs from the base of tips are also shown to be present across the site.

There are considered to be five main catchment areas draining the site as summarised below:

- Catchment Area 1 – The Nant Cwm Pant Bach drains land within the north-western area of the site (Zone 1) and the land located beyond off-site;
- Catchment Area 2 - The principal stream in this catchment is the Nant Rhyd y Car which is fed by the Nant Cwm Glo and the Nant Llwyn Yr Eos streams which drain the central land area of Zone 1;
- Catchment Area 3 – Characterised by a series of small channels and ephemeral streams which drain emerging springs from the base of tips and drifts within the southern area of Zone 1 and central part of Zone 4;
- Catchment Area 4 – The diverted channel of the Nant Canaid stream flows close to the southern boundary of the site, through the Cwm Pit and discharges into a large marshy ponded area adjacent to the former Tub Boat Canal; and,
- Catchment Area 5 – Comprises the original Nant Canaid stream which flows close to the southern site boundary before discharging into the River Taff to the east of the site.

No current surface water abstraction licenses are located on site or within 250m of the site boundary. No current discharge consents have been identified within the site boundary. Baseline information pertaining to the surface water quality at the site is currently unknown.

Assessment Criteria

An initial qualitative hydrological and hydrogeological risk assessment have been completed for the site to assess the potential risk the proposed development poses to surface water features and groundwater beneath the site. The lack of targeted site-specific data has not allowed a quantitative assessment of potential risk to receptors at this stage but serves to provide baseline information to inform the EIA process.

An assessment of the potential impacts on the hydrological and hydrogeological environments from the proposed development will be undertaken in accordance with current legislation and guidance during the EIA stage. The impact assessment will be based on a risk assessment approach whereby the risk is established before and after the activity which is being assessed. The risk assessment is a combination of the probability of an event and the consequence of the event occurring.

Anticipated Impacts

Based on the information available and the preliminary risk screening assessment, it is considered there is a potential for negative impacts on the hydrogeological and hydrological receptors during the construction and operational phases of the development.

However, it is anticipated that mitigation measures could be implemented to ensure the site does not pose a risk to the hydrological and hydrogeological environments.

Construction Phase Effects

During the construction phase, the following potential impacts to the groundwater and hydrological environments have been considered:

- Accidental spillages (including fuel oil & lubricants) during refuelling / maintenance of plant or the use chemicals during the construction works;
- Mobilisation of elevated contaminants present in the natural soils or Made Ground deposits (spoil tips);

- Earthworks for the proposed areas of development could create potential pathways for contaminant migration;
- Alteration of the natural drainage / infiltration mechanisms affecting the natural overlying aquifer cover and therefore recharge pathways to groundwater present in the Coal Measures;
- Alteration of the natural surface water protection provisions and changes to flow / quality within surface water features including springs at the site;
- Thinning / removal of spoil tips which could potentially lead to the disruption of groundwater flow within the tips;
- Potential for increased sediment laden water run-off into surface water features such as streams or ponds.

Operation Phase Effects - Hydrogeology

The proposed scheme incorporates a multi-use development consisting of built and unbuilt leisure. During the operational phase of the development, the following potential impacts (adverse and beneficial) to the hydrogeological and hydrological environments are anticipated:

- Accidental spillages of minor fuel, chemical and/or sewage (leakage of sewer pipes);
- Diffuse pollution from site maintenance works e.g. use of road salts and herbicides / disinfectants;
- Mobilisation of historical ground contamination present within the shallow natural soils and Made Ground deposits (spoil tips);
- Alteration of natural drainage / infiltration recharge to groundwater due to the presence of hardstanding (low permeability) surfaces in areas of development;
- Reduction or increase in overland flows to surface water features leading to a change in water quality; and,
- Alteration of existing mine (shaft / adit) entrances resulting in the blockage / disruption of minewater discharge;

Data Gaps and Mitigation Measures

Based on the desk top assessment, walkover and preliminary risk screening process, it is apparent that the interactions between the hydrological and hydrogeological regimes at the development site are complex and are a function of the previous site uses. A number of uncertainties and data gaps were identified during the preliminary risk screening which will require further investigation to inform any proposed mitigation measures to be developed at the EIA stage. Such data gaps are expected to include (but may not be limited to) the following:

- Site specific qualitative groundwater data (level and water quality) over a sustained period at targeted locations (and within key geological units);
- Delineation of underlying geological information at key development areas;
- Site specific surface water quality and generalised flow data at targeted locations;
- Capture of minewater quality data;
- Water quality and flow data, in addition to specific uses, for current identified groundwater and surface water receptors; and,
- Specific construction details for individual elements of the development.

Appendix 8: Arboriculture

Baseline information

Tree Condition and Value Survey to BS5837:2012 and preparation of a Tree Constraints Plan

A tree condition and value survey will be carried out in accordance with BS5837:2012 'Trees in relation to design, demolition and construction – Recommendations' for the development extents. The survey will be carried out by a qualified and experienced arboriculturalist.

Tree survey work will involve site survey work to record the following information for each tree with a stem diameter greater than 75mm (measured at 1.5metres from ground level), hedge and group of trees or shrubs:

- Species and variety;
- Reference number (to be included on survey plan);
- Height to the nearest 0.5 metre;
- Trunk diameter to the nearest centimetre (at 1.5 metres above ground level) in accordance with Annex C of BS5837:2012;
- Crown spread to the nearest 0.5 metre (in north, east, south and west directions);
- Height of crown clearance;
- Relative vigour;
- Approximate age or age class;
- Condition (this may be by reference to defined categories ranging from trees that are in excellent health, free from defects, and have a long-life expectancy, to trees that are dead and dying) and general comments including, for example, special value, rarity and any defects;
- Preliminary management recommendations for tree surgery or other remedial treatments;
- Estimated remaining contribution in years; and
- Retention category as defined by the current British Standard 5837:2012.

The information collected will be presented in an individual report along with a tree constraints plan prepared in CAD format using KeyTREE, showing the trees, their quality and value category and provisional circular root protection areas (RPA). The trees will also be given a unique reference number on the Tree Constraints Plan. The information recorded on the tree constraints plans will be shown on an OS MasterMap base plan along with the position of the trees and tree groups recorded using differential GNSS for the individual trees, and GNSS and overlaid aerial images for the groups. The differential GNSS provides sub-metre position accuracy under standard working conditions. Liaison will also be carried out with the local planning authority to identify any trees on site with a Tree Preservation Order (TPO).

Preliminary Arboricultural Impact Assessment

As the development proposals relate to an outline planning application a Preliminary Arboricultural Impact Assessment will be carried out to identify the trees and tree groups on site that should be retained and removed as part of the development proposals for the site. The impact of the proposed development on the existing trees and the wider environment will be assessed. The assessment will take account of the recommendations within BS5837:2012 and any local planning authority supplementary planning guidance on trees and development.

A Tree Retention and Removal Plan will be prepared showing trees and shrubs to be retained and removed as part of the outline development proposals. The Tree Retention and Removal Plan will be shown on the outline development proposals layout for the site.

Appendix 9: Townscape and Landscape

Baseline Information

A full landscape and visual impact assessment (LVIA) will be carried out in accordance with the recommendations in the Guidelines for Landscape & Visual Impact Assessment Edition 3² (GLVIA3), which will include:

- Description and evaluation of the landscape of the site and surrounding landscape context, including a review of LANDMAP information, and of the visual amenity of people in the surrounding area, which might be affected by the proposed development;
- Analysis of the development proposals and the potential effects on the landscape and visual amenity associated with the scheme's design or operation, and whether they are likely to be significant;
- Proposals for mitigation measures which could be implemented in order to avoid, reduce or offset adverse effects, especially those identified as significant, and, where possible, incorporate these in the scheme design;
- Description of any enhancements of the landscape or visual amenity incorporated in the development proposals;
- An assessment of the degree and nature of the landscape and visual effects of the proposed development with integral mitigation measures in place, and whether they are significant.
- A cumulative assessment with other major infrastructure developments within 5km of site;
- A qualitative lightness & darkness assessment, describing how the present light/dark character of the landscape would change, how that would impinge on night-time visual qualities, and whether that would affect the Dark Skies designation of the Brecon Beacons National Park;
- A review of relevant national and local policy for landscape and a review of the assessment findings against the relevant policy considerations.

Preliminary site and viewpoint visits, indicate the study area for the LVIA should extend up to 3km for both landscape and visual impact assessments and the cumulative effects assessment would include other relevant developments up to 3km from the site.

The landscape and visual amenity aspects of the ecological and cultural heritage designations and policy will be addressed in the LVIA, as appropriate.

The detailed selection of viewpoints for the visual impact assessment, of those to be illustrated with photomontages (and at what development phases), has been subject to separate scoping exercise with Mr Tom Bramley, Landscape Officer at MTCBC. Preliminary studies indicate that the site's location on the western valley side provides potential visibility from within the valley system, but is restricted by the enclosing ridges. Likely visual receptors and locations for representative viewpoints are:

- Residential areas on the eastern valley side: Pen-y-Darren, Thomastown, Ysgubor Newydd, and to the north: Heolgerrig, Cefn-coed-y-cymmer;
- Routes and areas of public access;
- Visitors to the national park, Cyfarthfa Castle, and other areas of interest or visitor attractions;
- Travellers on roads, noting that the A470 follows or is close to the eastern site boundary.

² Landscape Institute and Institute of Environmental Management & Assessment, Guidelines for Landscape & Visual Impact Assessment Edition 3, Routledge, 2013

It is intended that preliminary findings of the LVIA would inform the design of the development proposals. Liaising with other topic specialists (ecology, cultural heritage, hydrology, etc), the landscape strategy for the development would be founded on green infrastructure principles, in order to develop an integrated mitigation strategy for significant or important effects identified.

The LVIA will form a chapter of the Environmental Statement, with separate sections dealing with effects on landscape, effects on visual amenity, and cumulative effects. Detailed information will be provided in appendices. The LVIA will be illustrated with plans and photographs, likely to include:

- Landscape policy & designations
- LANDMAP and landscape character
- Landscape of the site
- Site photographs
- Visibility analyses, including computer generated zones of theoretical visibility (ZTV)
- Viewpoint photographs
- Photomontages.

Guidance etc to be referred to:

- GLVIA3;
- Landscape Institute's Advice Note 01/11 Photography and Photomontage in Landscape and Visual Impact Assessment;
- Relevant policy, landscape character assessments, and other contextual information sources;
- LANDMAP information for the site and landscape context study area;
- Landscape Character Assessment: Guidance for England and Scotland, published by Countryside Agency, 2002;
- Landscape and historic landscape character assessments for the Merthyr Tydfil area;
- Met Office weather data for the area, as a factor affecting the assessment of, especially, visual impacts.

The LVIA will be carried out by Chartered Landscape Architects, with assistance from appropriately qualified personnel, including GIS and graphics specialists.

Appendix 10: Noise, Acoustics & Vibration

Baseline Information

Preliminary consultation will be undertaken with Merthyr Tydfil Borough Council where relevant, to agree the proposed approach of the noise survey methodology. Further consultation, with the local planning authority will be undertaken where necessary.

The closest existing residential receptors are located on Parc Cwm Pant Bach and Brondeg, to the north and those adjacent to the local road network, including the A470. In addition, sensitive receptors are located to the south of the site at Blaencanaid Farm.

A further assessment to identify the location of additional sensitive receptors such as schools, hospitals and ecological receptors likely to be located within or at further distances from the site, will also be undertaken within the technical report. Such receptors along with residential properties are considered to be of high sensitivity.

The baseline environment has been established by measuring ambient noise levels on and within the vicinity of the site; the results of the monitoring confirmed that noise levels around the site are dominated by road traffic noise on the A470 predominantly, with some residential traffic near the residences to the north of the site during the day and evening. The closest existing residential receptors have been considered as part of a 7-day noise monitoring survey which included attended and unattended measurements. Full details of the noise monitoring survey will be presented within the report. Figure 1, below, shows the monitoring positions of the noise monitoring survey. (The survey was completed in 2017. There have been no significant changes to existing noise sources and no new sources (such as main roads) introduced since the survey. Accordingly, the baseline conditions are considered to remain representative of pre-covid conditions for use within the assessment which is in-line with the Institute of Acoustics and Association of Noise Consultants' guidance of the implications of COVID restrictions.)

Due to the distance from identified sensitive locations, no significant environment effects in relation to vibration are anticipated and so vibration has not been considered further in this document.

Potential Environment Effects of the Scheme

Construction Assessment

1.2.2 Operational noise levels will be compared against BS 5228-1+A1:2014 Code of Practice for noise and vibration on construction and open sites – Part 1: Noise. The assessment would determine the likely effect of the construction phase on existing receptors and will recommend mitigation measures as necessary for inclusion within a Construction and Environmental Management Plan (CEMP).

The construction assessment will assess the noise levels associated with deliveries to the development site, construction operations and fixed/mobile plant. These levels will then be compared against baseline noise levels and the criterion noise levels given in the guidance document.

The results of the assessment will be able to be used iteratively to feed into the design and mitigation strategy (height and locations of barriers/enclosures) together with a noise report.

Traffic Assessment

The potential exists for noise from the development to impact upon nearby sensitive receptors. The likely sources of noise within the development are:

- Road traffic noise from development generated vehicles on the local road network

Where information is available, outline assessment will be undertaken with reference to percentage change in traffic flows in line with guidance from the Design Manual for Roads and Bridges, LA111 Noise and Vibration. It is considered that due to the nature of the traffic, a full traffic assessment will be required.

In terms of off-site road traffic noise there is the potential that there will be both beneficial and adverse effects due to the proposals. This will be quantified within the report based on 'with' and 'without' development traffic flow data.

TAN 11 Noise Assessment

The proposed development will not generate vibration once constructed and operational and it is not anticipated that the proposed development will be subject to significant sources of vibration and therefore vibration will not be considered as part of the assessment.

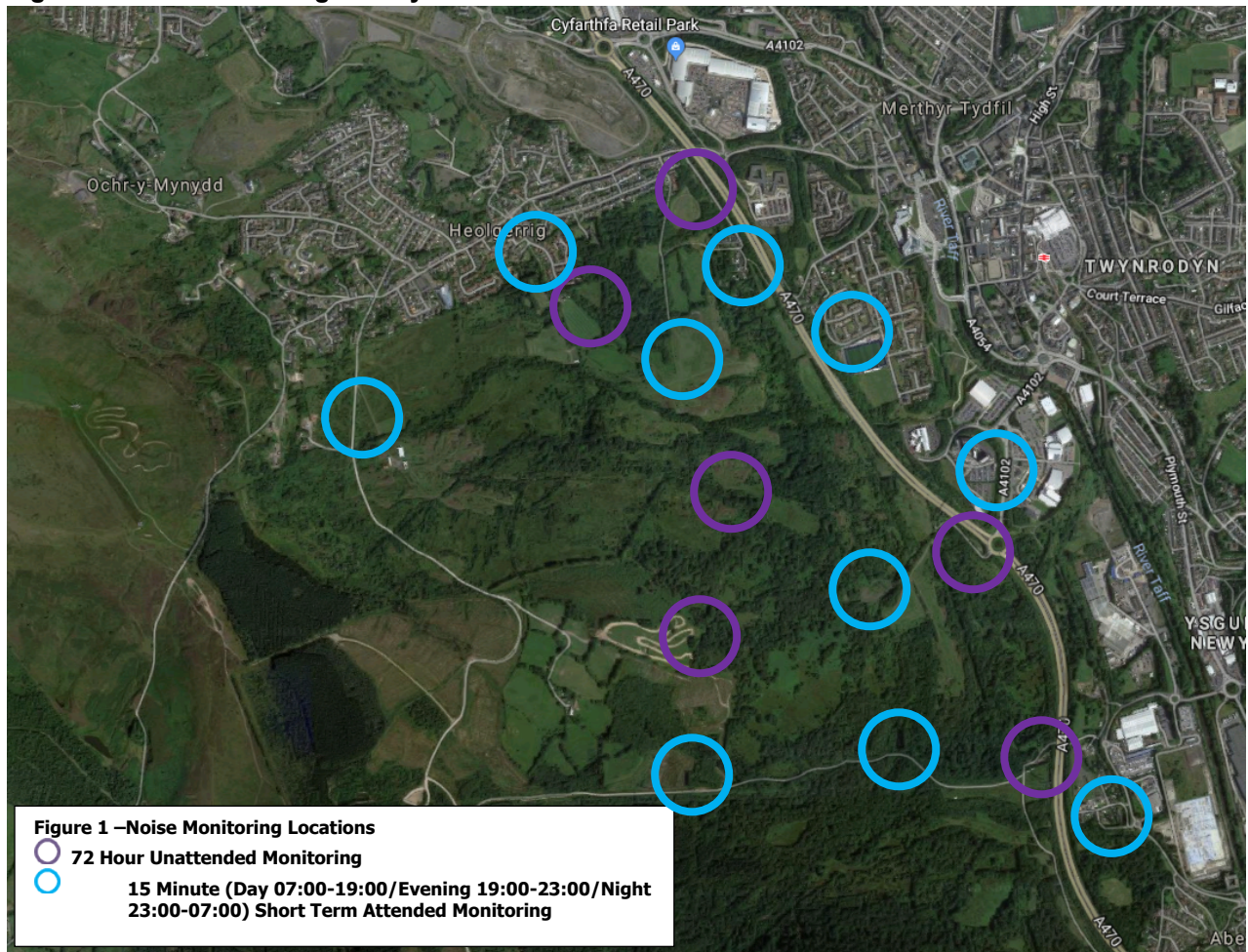
If and where recreational or commercial sources of noise such as building services plant are proposed as part of development of the scheme proposals, the technical report will include an assessment in line with BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' would be undertaken. As it is unlikely that detailed design of plant sources would be available at the time of reporting, a qualitative assessment for future commercial noise sources would be undertaken based on the measured background levels obtained during the survey. This approach would allow limits and suitable conditions to be set at certain receptors to ensure compliance with the aforementioned standard to ensure that no adverse impacts occur.

Additional consideration will be given to the effects of noise at proposed hotels and forest lodges, however it is not anticipated that significant adverse noise effects would arise as a result of the existing surrounding noise environment. If necessary, effects can be mitigated through good design and consented conditions, so that significant adverse effects will not occur; this will be appended within the technical report and will reference relevant guidance documents such as TAN 11, BS 8233 and WHO Guidelines. As such, it is considered that there will be no significant adverse effects on future residents and the assessment of proposed habitable spaces can be scoped out of the EIA.

Mitigation Recommendations

If identified within the noise assessment, noise control measures will be incorporated within the scheme design including the consideration of appropriate bunding/barriers or other mitigation measures such as establishing noise limits and other hard mitigation measures for proposed noise sources where appropriate and the consideration of best-practice measures for inclusion within a CEMP.

Figure 1 Noise Monitoring Survey Locations



Appendix 11: Air Quality

Introduction

An assessment of the potential effects during the construction and operational phases of the proposed development on air quality will be included within the ES Chapter.

Construction Phase Assessment

A semi-quantitative assessment of the air quality effects of the construction phase of the development would be undertaken in accordance with the Institute of Air Quality Managements 'Guidance on the Assessment of the Impacts of Dust from Demolition and Construction' document. Appropriate site specific mitigation would be recommended in accordance with the IAQM document for inclusion in the Construction Environmental Management Plan.

Operational Phase Traffic Assessment

Computer based modelling of the predicted changes of traffic emissions within the study area would be undertaken using an approved atmospheric dispersion modelling package (ADMS Roads). The model would provide predicted annual average concentrations of nitrogen dioxide (NO₂) and PM₁₀ at receptors within the study area for the year of opening. Specifically, the model would assess air quality within the study area with reference to the UK Air Quality Standards, and would describe the significance of the air quality changes within the development with reference to non-statutory guidance issued by EPUK, IAQM issued January 2017 and guidance within the PPW.

A baseline air quality dispersion model would be developed for the study area and it would be verified using the latest AQ Annual Status Report for Merthyr Tydfil County Borough Council. The verification would be undertaken in general accordance with guidance in Section 7 LAQM Technical Guidance TG(16). The baseline and assessment year models would include traffic data for the local road network, representative local meteorological data and background pollution data from the national air quality archive. The traffic data provided by Transport Consultants will be used in the assessment; emissions factors for this year will be obtained from the Emissions Factor Toolkit v10.1 from the DEFRA website. Additional baseline traffic will be sourced from the DfT website where required.

Background sources of pollutants include industrial, domestic and rail emissions within the vicinity of the study site. In August 2020, DEFRA issued revised 2018 based background maps for nitrogen oxide (NO_x), NO₂, PM₁₀ and PM_{2.5} which incorporate updates to the input data used. 2019 background maps will be utilised throughout the assessment to provide a conservative assessment. The updated mapped background concentrations to be used in the assessment are summarised in Table 7.

Table 7 Published Background Air Quality Levels (µg/m³)

UK NGR(m)		2019			
X	Y	NO ₂	NO _x	PM ₁₀	PM _{2.5}
303500	204500	5.62	7.08	11.01	7.13
304500	204500	6.40	8.11	10.74	7.13
303500	205500	5.71	7.20	10.63	7.06
304500	205500	8.46	10.88	11.67	7.61

Figure 2 (below) shows the proposed sensitive receptors to be analysed.

The site is situated on Cwm Glo A Glyndyrys Site of Special Scientific Interest which is an ecological receptor. Three ecological receptors will be included in the assessment. A nitrogen deposition/ habitat assessment will

be undertaken to assess ecological receptors within sensitive sites of the SSSI site affected by the proposed development. There were no other ecological receptors identified within 1km of the site boundary.

As required under section 82 of the Environment Act 1995, Merthyr Tydfil County Borough Council have conducted an ongoing exercise to review and assess air quality within its area of jurisdiction. The assessments have indicated that concentrations of NO₂ are above the relevant AQOs at one location of relevant public exposure within the Council. Merthyr Tydfil County Borough Council has designated an Air Quality Management Areas (AQMA) which is described below:

Table 8 Air Quality Management Area

AQMA	Description	Pollutants Declare
Twynyrodyn Road AQMA	Monitoring identified an exceedance of the annual mean NO ₂ air quality standard. This was associated with traffic, in particular uphill traffic using Twynyrodyn Road. The AQMA extends from the Western End of Twynyrodyn Road to 147 Gilfach Cynon. A Welsh copy of the order is available.	NO ₂ (2017)

The AQMA is located 863m east to the site. Therefore, there is the potential for the proposed development to introduce additional vehicle movements into an area with existing elevated annual mean NO₂ concentrations.

The model will be verified to local air quality monitoring.

We are proposing to use meteorological data from 2019 from Sennybridge Meteorological Station, which is considered representative of conditions at the site, displayed in Figure 3.

Figure 2 Sensitive Receptor Locations and Diffusion Tube Locations

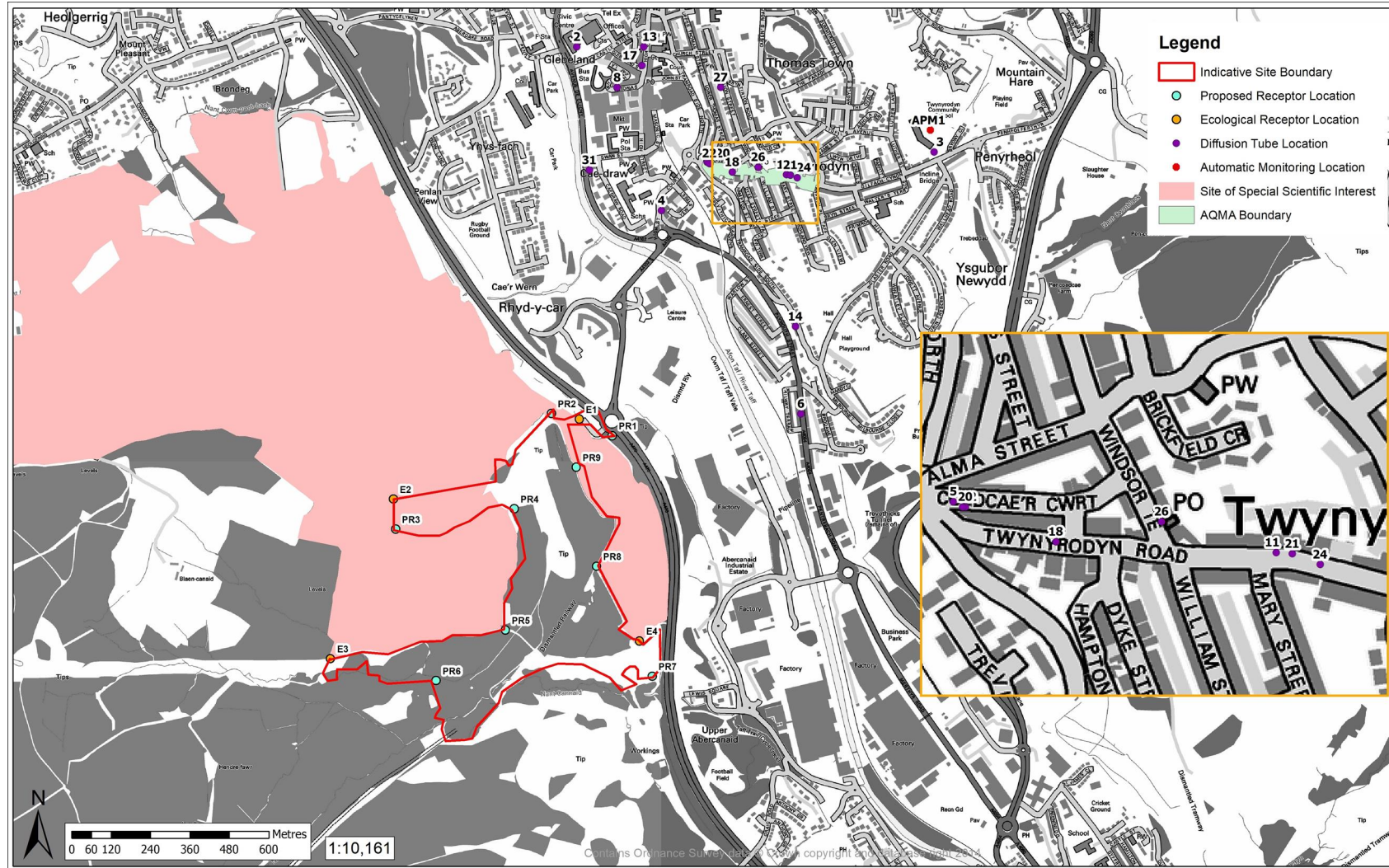
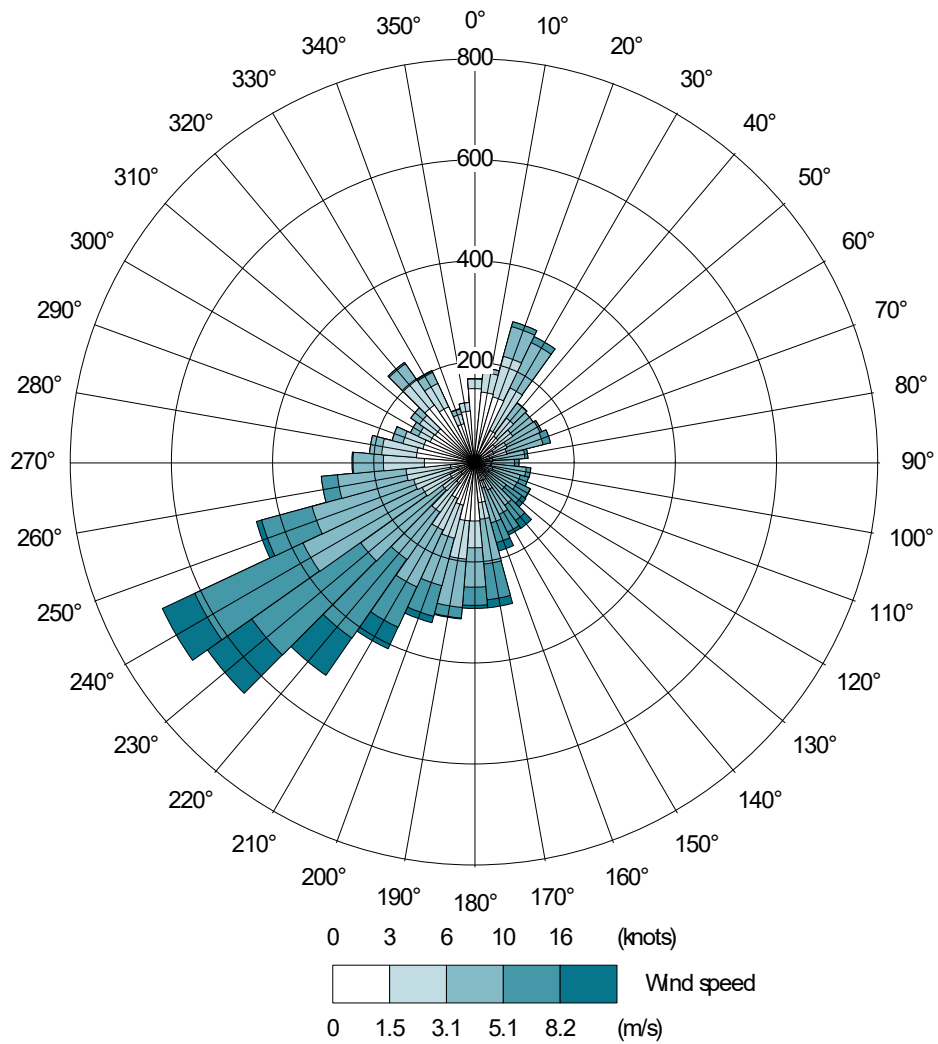


Figure 3 Sennybridge 2019 Meteorological Station Wind Rose



Appendix 12: Lighting

Baseline

Residential receptors are located adjacent to the proposed development site boundary with further residential receptors located at greater distances from the site adjacent to the local road network. In addition to residential receptors, ecological receptors are expected to be present along the network of streams and hedgerows. Such receptors are of high sensitivity.

The baseline environment has been established by measuring existing pre-curfew and post-curfew lighting conditions. Existing residential receptors as well as ecological receptors have been considered. Full details of the light survey will be presented as an appendix of the ES.

Scope of Assessment

A 3D representation of the proposed development and surrounding area will be produced within the DIALux light model, based on the proposed site layout and the specifications of proposed light sources. Specifications of typical case lighting columns may also be utilised should this data be unobtainable.

Light spillage will be predicted at sensitive receptor locations and compared with the guideline values stipulated within the ILP document, 'Guidance Notes for the Reduction of Obtrusive Light' in order to provide an indication of the potential effects of proposed light sources at existing property façades. Where light trespass at sensitive receptors is deemed to be significant, mitigation options will be developed in order to manage the risk and minimise or avoid potential adverse effects.

Potential Environment Effects of the Scheme

Construction Assessment

The most notable impacts due to increases in light during construction will be during periods when daylight is not adequate for undertaking work, mainly through winter months.

Exact details regarding the times of operation can only be estimated at present and, therefore, it is difficult to predict accurately the magnitude of potential light effects on local receptors.

Given the nature of such works there is the possibility that construction operations will require additional lighting in the form of portable light towers. Any impacts would be temporary in nature and adverse. The level of light will be dependent on the location of the construction activities on a daily basis and the equipment being used, with light levels being attenuated as the distance between the source and receptor increases.

Through the use of standard light control measures, effects which could potentially be significant are not anticipated. This can be controlled by consented conditions. Therefore, it is proposed that an assessment of construction lighting is scoped out of the ES. However, recommendations with regard to Best Practice, with reference given to BS EN 12464-3 'Lighting of Work Places – Outdoor Work Places', 2007, will be presented in order to minimise light impacts where appropriate. The details of such measures can, where appropriate, be implemented as part of a CEMP which would be collated prior to the construction works taking place.

Operation

During the operational phase of the development there is the potential for artificial lighting from the leisure scheme to have an impact on existing residential receptors and vehicle drivers along the A470.

There is also a potential for artificial lighting to have an impact on ecological receptors within the site and along the boundary.

By following best practice lighting design measures, such as having downward facing lights, it is not anticipated that sky glow from the proposed development will be significant.

Preliminary Additional Mitigation Measures

Design

Where applicable, light control measures will be incorporated within the scheme design. However, such measures will only be indicative at this stage.

Construction

Construction works may be subject to control by suitably worded planning conditions. Given the absence of detailed information at this outline stage in relation to construction methods and programmes, it is recommended that 'Best Practicable Means' should be employed to minimise any impacts.

It should also be noted that the future baseline of the site will change as the development phasing progresses. The mitigation strategy proposed accounts of this evolving future baseline to ensure these are then taken into account at reserved matters application stages.

The proposed CEMP will be an appropriate document within which appropriate procedures and methods can be specified to protect light sensitive receptors. This will include a series of specific method statements identifying methods of working and controls to address the development's construction light impacts. The CEMP will be implemented during the construction phase. Mitigation measures specified below have been included as an example of suitable mitigation measures and should not be regarded as an exhaustive list. Therefore, the following additional mitigation should be considered as the minimum additional mitigation required to control and minimise light impacts from such associated activities.

- Careful selection of working methods and programme;
- Where practicable, lighting towers shall be carefully positioned on the site boundary and directed within the site;
- Adjustable luminaires will be carefully aimed in order to increase efficiency and minimise unwanted light spillage;
- Lighting will be directed downward in order to reduce upwards light spillage associated with on-site lighting and therefore minimise impacts on the dark sky landscape; and,
- It would be prudent to carry out light measurements at the site boundary during the installation of on-site luminaires.
- Employ best practices and follow guidance of BS EN 12464-2.

Operation

Following the on-site lighting survey, it was concluded that the residential properties surrounding the proposed development site should be classified as being within ILP Environmental Zone E2. Based on this assumption, light trespass associated with the proposed development at existing properties is expected to be within the relevant ILP criteria. Dependent upon the ecology survey outcomes, it is possible that ecological receptors could be adversely affected as a result of street lighting associated with the proposed access routes and within the leisure development.

It is possible to design a lighting scheme in order to meet British Standards and best practice guidance for achieving suitable lighting levels as well as minimising obtrusive light. The following mitigation measures should be considered throughout the external lighting design:

- Possible introduction of curfews for lighting affecting ecological receptors;
- Selection of luminaires with minimal upward lighting, forward, back and side spillage as appropriate to the location;
- Careful orientation, placement and mounting of luminaires, sensitive to the amenity of surrounding receptors;
- Minimising column heights;
- Use of shields and baffles where appropriate (particularly to sports pitch lighting);
- Post installation light monitoring.

Appendix 13: Services and Energy

An initial utility assessment has been carried out confirming that the site is relatively unconstrained on the assumption the development can work around the known overhead cables and intermediate gas main to the south of the site. There appears to be capacity in the utility networks to serve the development.

The detailed scope will consist of the following:

- The scope of utility diversions and other alterations required to accommodate the general development masterplan including a review of those services that might reasonably be kept in-situ, highlighting Easements, Wayleaves and other Rights of Access and all safety/environmental buffers
- The scope of any enabling works including service disconnections and temporary services
- An assessment of peak water, gas and electricity loads for the new development using recognised best practise or generated by similar developments
- A provisional scope of likely onsite and off-site infrastructure need in order to provide new metered connections at each point of use, including indicative budgeting costs
- Applications to each utility undertaker to obtain budget costs for diversion and new connection works for the site
- Details on water quality, TV reception and broadband availability
- Preparation of a Preliminary Utilities Appraisal (report) including budget costs and risks
- Preparation of ES chapter - This chapter will identify the likely environmental impacts resulting from the supply of utility services to the proposed development, specifically relating to electricity, gas, potable water, foul water sewerage and telecommunications. Information will be obtained through consultation with relevant service providers. The assessment will identify potential utility diversions and upgrading works required to accommodate and service the proposed development; evaluate the significance of the potential impacts, comment on mitigation measures and identify residual impacts.

Appendix 14: Waste

The proposed development at Rhydycar West would generate quantities of waste during both the construction phase and the operational phase, once the site is occupied.

Baseline Conditions

The existing site currently comprises 127 hectares of land which predominantly comprises woodland and grassland on the site of a former, partly restored, coal mine. It is also understood there are some remaining redundant built features at the site. The site therefore does not currently produce measurable quantities of waste. In the absence of any built development on the application site, this would not be expected to change in the future.

Assessment of Waste Management Capacity

Waste produced during the site clearance and construction phase of the development would predominantly comprise inert construction, demolition and excavation (CDE) waste with quantities of biodegradable wastes produced during the latter stages of construction. Waste produced during the operational phase would comprise commercial waste.

Planning Policy Review

The Merthyr Tydfil Replacement Local Development Plan (LDP) 2016 – 2031³ was adopted by the Council on 29th January 2020. The LDP is the basis for land use planning decisions in the County Borough, excluding Brecon Beacons National Park.

Page 7 of the LDP provides a summary of the Final Sustainability Appraisal Report, which '*sits alongside the Plan*'. The summary states '*A good network of waste facilities exists.*' Supporting paragraph to Policy EcW14: 'Waste Facilities' also states '*... there is currently sufficient capacity in the region...*'

Paragraph 6.7.121 of LDP confirms '*The latest Waste Planning Monitoring Report for South East Wales (2016)*'⁴ '*there is no further need for landfill capacity within the South-East Wales region...*'

Construction Phase

The potential environmental impact arising from construction waste would depend on a number of factors including the volumes and nature of the waste produced and the available existing and future capacity for its management. However, the intention is to achieve a cut and fill balance during the course of redevelopment, thus limiting the need to export waste from the site. Nonetheless, significant impacts would potentially arise if there was insufficient waste management capacity for the predicted levels of waste arisings.

A search of waste management facilities that could manage the waste generated by the development proposals has been undertaken. The sites have been identified through information available on Natural Resources Wales (NRW's) webpage 'find details of permitted waste sites'⁵ as well as Waste Permit Returns Data WPRD, which is also available through NRW.

¹ [Replacement Local Development Plan – Written Statement: Merthyr Tydfil County Borough Council 2020](#)

² [Waste Planning Monitoring Report South East Wales: Flintshire County Council 2016/2020](#)

³ [Find details of a permitted waste site \(https://naturalresources.wales/evidence-and-data/maps/find-details-of-permitted-waste-sites/?lang=en\)](https://naturalresources.wales/evidence-and-data/maps/find-details-of-permitted-waste-sites/?lang=en) Natural Resources Wales (No date)

The search shows that there are currently eleven permitted operations, across eight different commercial sites which accept inert waste. The majority of these sites are waste transfer stations (WTS) with treatment activities, which accept household, commercial and industrial (HCI) wastes. The sites are within 23 road km of the site and are displayed in Table 9 below:-

Table 9: Local Facilities that accept Construction and Excavation Waste

Operator	Site Name	Site Description	Road Km from site	Permitted Throughput & Permit Reference	Tonnages Received in 2019
Transfer and Recycling					
Cynon Valley Waste Disposal Company Ltd	Bryn Pyca Waste Operations, CF44 0BX	Inert WTS (with treatment)	8.1	150,000 TPA AP3199FE	51,528
Cynon Valley Waste Disposal Company Ltd	Waste Transfer Station Tir Ergyd Yard, CF44 0BX	HCI TS (including treatment)	8.1	74,999 TPA NP3198VA	14,064
Merthyr Tydfil County Borough Council	Merthyr Borough Recycling Centre Ltd, CF48 2TA	HCI WTS (with treatment)	8.9	120,000 TPA. ZP3899FX	15,512
Biffa Waste Services Limited	Trecatti Waste Management Site, CF48 4AB	Soil treatment (hazardous and non-hazardous) / Composting Facility	10.9	30,000 TPA 75,000 TPA RP3733PC	*
Greens Recycling (Wales) Ltd	Greens Recycling Centre, CF45 4EP	HCI WTS (with treatment)	16.7	75,000 TPA. SB3493HB	8,698
Valley Recycling Ltd	Tydu Farm, CF46 6PH	HCI WTS (with treatment)	19.4	24,999 TPA. UP3695FZ	1,704
Gellia'r-gwellt Uchaf Transfer & Composting Station	Bryn Recycling Limited, CF82 8FY	HCI WTS (with treatment)	19.7	150,000 TPA. WB3993HE	105,557
Thomas Waste Management Ltd	Hafod Garage Waste Transfer Station, NP23 4GU	Hazardous and Non-Hazardous WTS (with treatment)	22.3	74,999 TPA. AP3399FR	35,170
Amber Engineering Limited	The Recycling Centre, CF82 7RJ	HCI WTS (with treatment)	22.8	74,999 TPA. XP3295FK	39,609
Landfill					
Cynon Valley Waste Disposal Company Ltd	Bryn Pica Landfill, CF44 0BX	Non-hazardous Waste Landfill	8.1	3,412 tonnes of inert waste & soils accepted in 2019. DP3732SQ	
Biffa Waste Services Limited	Trecatti Waste Management Site, CF48 4AB	Non-hazardous Waste Landfill	10.9	22,025 tonnes of inert waste accepted in 2019 (not including soils)* RP3733PC	

*All activities operate under permit RP3733PC. No breakdown of management method, e.g. landfill or recycling is provided in WPRD.

The NRW permit records show that all of the sites, except Trecatti Waste Management Site, are Waste Transfer Stations and have permitted treatment activities. The WPRD for 2019 shows that all of the other sites accept quantities of both inert C&D waste as well as soils. The Trecatti Waste Management Site has a separate soil recycling and green waste composting operation and therefore could also help to recycle excavation waste from the development.

Quantities of green waste could also be generated during the preparation of the site for development. The Trecatti waste management facility has a 75,000 tpa limit for its composting operation and the Gellia'r-gwellt Uchaf site, which has around 45,000 tpa spare capacity, also includes a composting operation.

It is not possible to calculate the remaining capacity for each of the operations at the Trecatti site as the WPRD data provides information for each permit as a whole. The 2019 WPRD shows that a total of 243,362 tonnes of material was brought into the site. The permit has a limit across all its activities of 675,000 tpa and has respective tonnage limits for the soil treatment (30,000 tpa) and composting operations (75,000 tpa). The tonnages received at the other sites in 2019 are displayed in Table 1. In 2019 there was a combined remaining capacity at these sites of **473,154 tpa**.

The 2019 WPRD shows that a total of 1,251,888 tonnes of waste classified as C&D wastes were managed in South East Wales in 2019. Of this figure 151,080 tonnes (12%) were managed at landfill and 930,139 tonnes were managed at transfer and recycling facilities and the remaining tonnages were managed at physical or physical-chemical treatment facilities. This indicates that it would be possible for the vast majority of the CDE waste to be managed at the transfer and recycling facilities displayed in Table 1. Furthermore, there are two nearby landfill sites that could manage the non-recyclable fractions of this waste stream. It should however be noted that Bryn Pica landfill site is currently time limited to 2025. Appendix 2 of the 2016 Waste Monitoring Report for South East Wales shows that Trecatti Landfill is not timebound.

Operational Phase

The Proposed Development includes the provision of a snow centre, water park, leisure, hotels and lodges. Commercial waste would be produced by these elements of the proposed development.

There would be an ongoing need to manage commercial waste arising from the development. Merthyr Tydfil County Borough Council offers a chargeable trade waste collection scheme for commercial waste. Alternatively, a private waste management contractor could be appointed to manage the commercial waste. In order to determine whether the production of commercial waste would have a significant environment effect, it is therefore necessary to consider the available commercial waste management infrastructure.

All of the sites previously listed in Table 1 are permitted to accept commercial waste. An investigation into additional commercial local waste infrastructure shows that there are another three facilities within 25 road km of the proposed development sites, which are permitted to accept commercial waste. These sites are displayed in Table 10, below.

Table 10: Additional Commercial Waste Facilities

Operator	Site Name	Site Description	Road Km from site	Permitted Throughput & Permit Reference	Tonnages Received in 2019
Transfer and Recycling					
MTCBC Waste Transfer Station	Merthyr Tydfil County Borough Council, CF48 4DR	HCI WTS (including treatment)	8.3	25,000 BB3092HJ	6,320
Mekatek Limited	Mekatek Ltd, NP22 5PY	HCI WTS (including treatment)	14.2	30,999 AB3698ZE	14,711
Silent Valley Waste Services Ltd	Silent Valley Waste Transfer station, NP3 6PZ	HCI WTS (including treatment)	24.3	74,999 MP3895FT	26,446

With the exception of the Inert WTS at Bryn Pica it is considered the remaining transfer and recycling sites in Table 1 are likely suitable to accept the majority of the commercial waste streams that would be generated. In addition to these facilities the three sites shown in Table 2 are also permitted to accept commercial waste. Therefore, a total of eleven sites have been identified that could potentially accept the commercial waste generated by the development. The 2019 WPRD shows the sites had a combined remaining capacity of **458,203 tonnes**. This excludes the available capacity at Trecatti Waste Management Site, where the composting operation could be suitable for managing green waste that would be generated at the site.

NRW's website shows that an updated Industrial and Commercial Waste survey⁶ has been completed with survey data from 2018. The report shows that the commercial recycling rate in the South East Wales Region was 65% in 2018. Land disposal in the region was consistent with the national average of 12%, 10% was managed through incineration, 9% was treated with smaller quantities managed through 'land recovery' (1%) and 'other' (4%) waste management methods.

Therefore, it is considered that around 75% of the generated commercial waste from the proposed development could be managed at the identified transfer, recycling and treatment facilities.

In terms of energy recovery (including incineration) it is understood that Local Authority Municipal Waste from Merthyr is taken to Viridor's Trident Park Energy from Waste (EfW) facility in Cardiff. Section 3 of the Waste Planning Background Paper states there is an existing EfW Facility in Pengarnddu Industrial Estate. This is considered likely to be referring to Merthyr Tydfil County Borough Council's (MTCBC's) facility (ZP3899FX) listed in Table 1, approximately 9 road km from the development site.

The Trecatti landfill site would be able to manage any waste fractions that cannot be recycled or recovered.

⁴ [Survey of Industrial and Commercial Waste Generated in Wales 2018: Natural Resources Wales \(No date\)](#)

Receptors

The key sensitive receptors to impacts arising from the generation of waste, during both the construction and operational phases of the proposed development, are waste infrastructure capacity, human receptors and environmental receptors.

Landfill

Due to the scarcity of landfill resources and that they are a finite resource, landfills are often regarded as high sensitivity in Environmental Impact Assessment (EIA) terms. It is noted that Bryn Pica landfill site is due to close in 2025 and Trecatti landfill site will be the only remaining landfill site within a 25-road km of the site.

Landfill sites are however rare in comparison to built waste management facilities and therefore a brief exercise looking at other landfill sites in South Wales has been undertaken. The 2019 WPRD shows that Docksway Landfill in Newport is the closest active and operational non-hazardous landfill site after Trecatti and Bryn Pica. Docksway is located approximately 45 road km from the development site. The site accepts municipal type waste as well as C&D waste.

There are a further three non-hazardous landfill sites, which are all approximately 50 road km from the development site. These are Tir John Landfill in Swansea and both Morfa Landfill and Pwllfawatkin Landfill in Port Talbot. A review of the 2019 WPRD suggests that waste types are however restricted at Morfa Landfill. Both C&D as well as municipal wastes are however accepted at Tir John Landfill and Pwllfawatkin Landfill. A review of the 2019 WPRD data suggests that some of the material accepted at these landfill sites is transported much further than 50 road km.

The 'Towards Zero Waste One Wales: One Planet'⁷ (TZW) is the overarching waste strategy document for Wales. The document sets out a long-term framework for waste management and resource efficiency to 2050. The key aim of the strategy document is to recycle 70% of all waste by 2025 with an aim of zero waste to landfill or recovery facilities by 2050.

Paragraph 6.7.121 of LDP confirms '*The latest Waste Planning Monitoring Report for South East Wales (2016) 'there is no further need for landfill capacity within the South-East Wales region...'*

It is therefore considered that there is suitable landfill capacity to manage any non-recyclable or non-recoverable waste generated by the construction and operational phase of development should it not be possible to take waste to the Trecatti facility. The need for landfilling is also likely to decrease over time as new technologies become available to manage certain waste types. It is considered that there is sufficient landfill capacity to manage non-recyclable or non-recoverable in this temporary period.

Potential Environmental Impacts and Their Significance

Construction Effects

Whilst it is considered the site would generate fairly substantial quantities of waste over the construction phase, it should be acknowledged that the development is likely to be constructed over an extended period. The human receptors who would be most at risk are site construction workers. This is attributed to the increased likelihood of exposure when compared, for example, with local residents. Site operational procedures would ensure that all staff have appropriate PPE when handling waste and manual handling of

⁵ [Towards Zero Waste – One Wales, One Planet: Welsh Assembly Government 2010](#)

waste would be discouraged to minimise the potential for accidents or injury. Waste storage areas would be secured to prevent unauthorised access. It is therefore considered that human receptors would not be adversely affected by the construction waste produced on site.

Site waste management procedures would ensure that construction waste does not migrate beyond the site boundary and ecological receptors would not therefore be affected.

Operational Effects

The proposed development would generate a wide range of commercial wastes for this development. There is an option to appoint a private waste management contractor or MTCBC's chargeable trade waste collection scheme to manage the operational waste.

It is not possible to forecast the quantity of commercial waste which would arise from the proposed development. However, given the available waste management options and the proximity of a number of commercial waste management facilities, it would be reasonable to assume that there is sufficient local capacity at commercial waste management facilities to manage the likely waste arisings.

Mitigation Measures

Construction Phase

The applicant would actively seek to reduce the amount of waste generated from the construction activities through a combination of design and operational measures.

Waste would be managed in accordance with the Waste Hierarchy. Where waste is produced, all opportunities to re-use the waste would be explored in the first instance. However, where re-use is not viable, the waste would be recycled if possible. No construction waste would be sent to landfill unless all available options higher up the Waste Hierarchy have been proven to be unviable for technical or economic reasons. A Site Waste Management Plan (SWMP) would be produced for each phase of the works. The purpose of this document would be to ensure that all site workers are aware of their responsibilities with regard to waste management, and the correct procedures for handling, segregating and storing waste are understood. The site induction process and on-going training procedures would ensure that the content of the SWMP is communicated to all staff for the duration of the construction phase.

Operational Phase

The completed development would incorporate well designed, safe and secure waste management storage facilities which enable the segregation of waste into recyclable and non-recyclable fractions. This would provide a significant contribution towards the sustainable management of commercial waste arisings.

Conclusions

The potential environmental impacts associated with the generation of waste during both the construction and operational phases of the proposed Rhydycar West development have been considered in relation to the impact on waste infrastructure, human receptors and the local environment, including ecological receptors.

It is considered that there is a sufficient waste management infrastructure in the local area to manage the waste arising from both the construction and operational phase of the development. Operational controls and site procedures would ensure that waste does not adversely affect human receptors or the local environment.

The investigation of waste management infrastructure in this note provides robust support to MTCBC's LDP which states: *'A good network of waste facilities exists'* and regarding waste management facilities *'... there is currently sufficient capacity in the region...'*

It is considered, that with the implementation of an appropriate SWMP, construction waste would be managed sustainably in accordance with the Waste Hierarchy and that the proposed development would not give rise to any significant environmental impacts. Accordingly, it is our contention that waste considerations can therefore be scoped out of the environmental Impact A assessment.